

On an Observer's Reaction to Hearing of Someone Harming Him or Herself

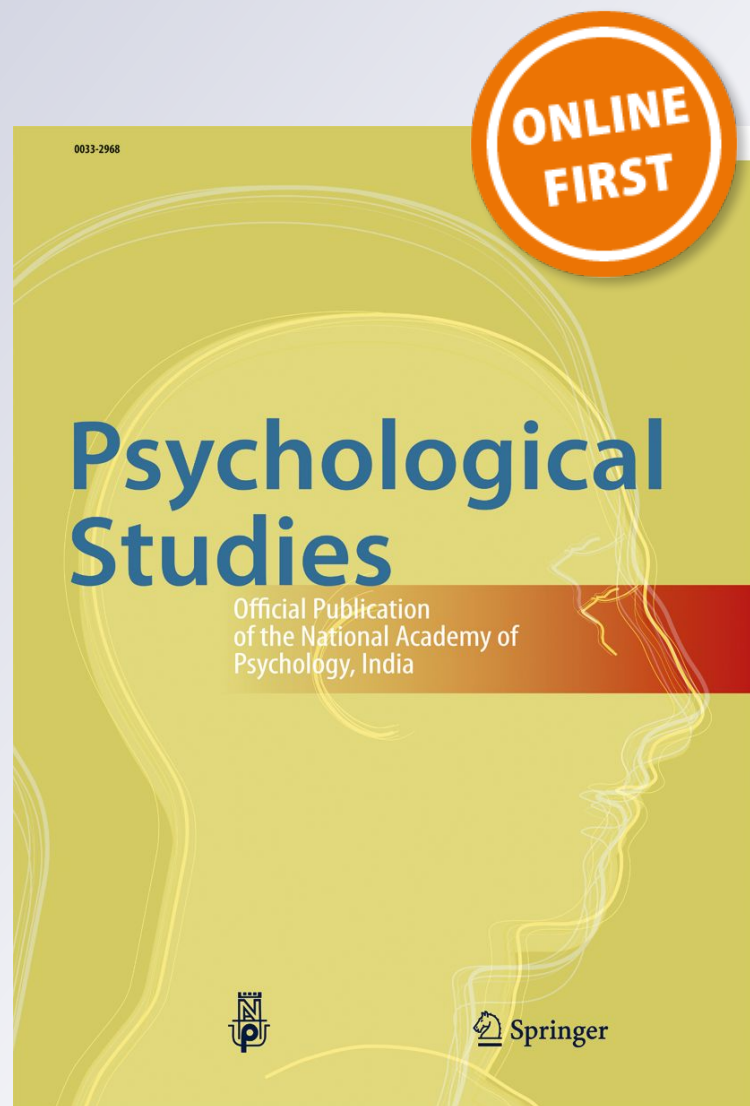
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Psychological Studies

ISSN 0033-2968

Psychol Stud

DOI 10.1007/s12646-018-0444-z



 Springer

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On an Observer's Reaction to Hearing of Someone Harming Him or Herself

Dolichan Kollareth¹ · James A. Russell¹

Received: 14 September 2017 / Accepted: 21 March 2018

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Abstract Anthropological studies in India inspired the idea of a distinct domain of moral purity, but a precise characterization of that domain has been elusive. One proposal based on current theorizing in psychology is that prototypical purity violations are self-harming actions, which are perceived as disgusting and immoral whether done accidentally or intentionally. In three studies ($N_s = 400, 80, 132$), we examined judgments of self-harming actions in two cultural groups—American and Indian. There was little support for the proposed characterization of the purity domain: Self-harms were slightly to modestly immoral for Indians and Americans. Both Indians and Americans found self-harms to be sad, not disgusting. And intentionality influenced how immoral and how sad the action was judged. Instead, the findings supported a view that all immorality, including those concerning self-harm, depends on perceived harm.

Keywords Emotion · Moral domain · Purity · Disgust · Culture

Introduction

Imagine that you are a witness to two events. In the first event, you observe one person harming another. In the second event, you observe that same person inflicting equal harm on him or herself. For the first event, you likely find the observed person's act, if intentional, to be immoral and you feel angry. But do you have the same reaction to the second event, when the perpetrator and victim are the same person? Much of morality concerns what we “do unto others”—the harm of others domain—but morality also concerns doing unto oneself. Murder is judged immoral, but so is suicide (Rottman, Kelemen, & Young, 2014).

Doing unto oneself is an interesting case for moral psychology. It seems to be a challenge for Gray and colleague's dyadic theory of morality, in which a perpetrator harms a victim (Gray & Wegner, 2011; Schein & Gray, 2015). There is another possibility, inspired by research in India (Shweder, Mahapatra, & Miller, 1987; Shweder, Much, Mahapatra, & Park, 1997). That research suggested a distinct domain of moral sanctity/purity (vs degradation), an idea incorporated into Moral Foundation Theory, according to which moral norms fall into various distinct domains (Haidt, 2007). Norms in each domain serve a different function and involve different cognitive and emotional mechanisms (Graham et al., 2013; Rozin, Lowery, Imada, & Haidt, 1999). According to one version, there are five domains: Care/Harm, Fairness/Cheating, Loyalty/Betrayal, Authority/Subversion, and Sanctity/Degradation (Haidt & Kesebir, 2010; Haidt & Graham, 2007). The first four domains necessarily involve the first case: witnessing someone harming, cheating, betraying, or subverting another person or group of persons. Only the last domain—sanctity (also known as divinity or purity) seems to cover the second event: witnessing someone

Electronic supplementary material The online version of this article (<https://doi.org/10.1007/s12646-018-0444-z>) contains supplementary material, which is available to authorized users.

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harming him or herself. The present study was motivated by the question, whether a self-harming action is indeed best characterized as a violation of the purity domain. The suggestion of Moral Foundation Theory is that the witness of a self-harm judges it to be immoral and disgusting. This judgment is pancultural and relatively insensitive to the intention of the perpetrator.

A good argument can be made that self-harm is a purity violation. Dungan, Chakroff, and Young (2017, p. 2) noted, “purity norms may apply primarily to self-directed actions, in which people act on themselves.” The many examples of purity violations in the literature underscore the self-directed nature of a purity violation: wearing unmatched clothing (Horberg, Oveis, Keltner, & Cohen, 2009), having plastic surgery to add a 2-inch tail to the end of one’s spine (Graham, Haidt, & Nosek, 2009; Russell & Giner-Sorolla, 2013), suicide (Rottman et al., 2014), eating a piece of rotten meat (Rozin et al., 1999), sex with a dead chicken (Horberg et al., 2009), and cutting oneself (Chakroff, Dungan, & Young, 2013). Purity violations used in experiments often have no clear victim other than the self. Some purity violations, however, do include another person, such as incest, but even this case has no clear victim other than those persons consensually involved (Haidt, 2003). In summary, as Young and Tsoi (2013; p. 585) wrote, “norms against harmful actions and norms against ‘impure’ actions serve distinct functions—for regulating interpersonal interactions (i.e., harm) versus for protecting the self (i.e., purity).”

To test whether self-harm is usefully characterized as falling in the sanctity/purity domain requires testing predictions from that characterization. Such predictions, to our knowledge, are not completely clear, but three such predictions seem at least implicit. Norms in the different domains rely on different emotional mechanisms. For example, moral violations that concern harming others are said to elicit a witness’s anger. Moral violations in the purity domain elicit disgust. Young and Tsoi (2013, p. 591): “Extensive work linking distinct moral emotions to distinct moral domains reveals that harmful actions elicit *anger*, whereas purity violations (including “taboo” behaviors related to food and sex) elicit *disgust* (e.g., Horberg et al., 2009; Rozin et al., 1999; Russell & Giner-Sorolla, 2011a, 2013; Russell, Piazza, & Giner-Sorolla, 2013).”

The rationale for this prediction is based on Rozin and Haidt’s (2013) theory of disgust, in which disgust initially evolved with the function of protecting oneself from oral ingestion of toxic or pathogen-related food, but was then co-opted to protect oneself from toxins or pathogen-related things from non-oral sources such as proximity to death, decay, blood, poor hygiene, gore, mucus, sweat, semen, and deformity of the body (Haidt, McCauley, & Rozin,

1994; Rozin, Haidt, & McCauley, 2008). In a subsequent co-optation—the one instrumental in moral judgments—disgust was extended to an even broader range of threats to the self (Rozin, Haidt, & Fincher, 2009). The evolution in disgust can thus be characterized as large changes on the input side, but conservation of output (Rozin, Haidt, & McCauley, 1999, 2000).

Disgust has been found to be the reaction not just to threats of physical contamination, but to threats to self that have nothing to do with disease, such as signing a piece of paper agreeing to sell one’s soul after death (Graham et al., 2009). (For additional examples, see Chakroff et al., 2013; Chakroff & Young, 2015; Young & Tsoi, 2013.) A particularly compelling example of self-harming action is suicide: participants’ reaction of disgust, but not of anger, predicted how immoral they found suicide (Rottman et al., 2014). Disgust was theorized to be the initial reaction to certain events without an obvious other person as victim, with the judgment of immorality following (Haidt, 2001; Haidt, Koller, & Dias, 1993).

A second prediction that follows from characterizing self-harm as a violation of a purity domain is that the perpetrator’s intention has little impact on the witness’s reaction (elicited emotion and judgment of the morality of the action). Chakroff et al. (2013) proposed that the disgust reaction to a self-harm is relatively insensitive to the protagonist’s intention: If a purity norm and its associated disgust reaction function to protect the self, the same reaction is maladaptive whether it is intentional or accidental. Their proposal is also consistent with other findings that disgust is less subject to reasoning than is anger (Russell & Giner-Sorolla, 2011a, b; Russell & Piazza, 2015).

The third prediction is that the witness’s reaction occurs in all cultures. The concept of a distinct purity moral domain was inspired by studies in India (Shweder et al., 1987, 1997). At least implicitly, Moral Foundation Theory is a theory of human morality, not something specific to North America.

Available literature fails to provide clear evidence on these three predictions for cases of self-harm. In early studies of the purity domain, testing the prediction of disgust as the emotional mechanism, cases of self-harm included pathogens and related threats to health—what, for simplicity, we subsequently refer to simply as pathogen-related: eating a piece of rotten meat (Rozin et al., 1999), sex with a dead chicken (Horberg et al., 2009), blood from cutting oneself (Chakroff et al., 2013), and picking up dog feces barehanded (Chakroff & Young, 2015). Perhaps the actions were disgusting not because they were self-directed harm, but because of the pathogen-related substances confounded with the self-directedness of the actions. Disgust at observing someone picking up dog feces

barehanded may have nothing to do with morality but may be simple old-fashioned garden-variety core disgust.

Cross-cultural empirical studies on purity violations are few, and the findings mixed. Some findings suggest that purity domain is more salient in non-Western cultures: Purity moral issues are more salient in rural India than the USA (Shweder et al., 1997). Disgust-eliciting violations without an obvious other person as victim (such as cleaning one's toilet with the national flag) are considered more immoral in Brazil than in America (Haidt et al., 1993). The purity-disgust association was stronger for Filipinos than for Americans (Vasquez, Keltner, Ebenbach, & Banaszynski, 2001). Another finding suggested the opposite: The purity-disgust association was stronger for American than Japanese participants (Rozin et al., 1999). Yet another study did not find a cultural difference: The purity-disgust association did not vary nationally for participants from USA and India (Russell et al., 2013). In the present study, we compare American and Indian participants' reaction to self-harm.

In short, questions remain as to whether self-harm is well characterized as a violation of a purity norm: (a) Are self-harming acts judged immoral and disgusting? Specifically, are self-harming acts *without* pathogen-related issues judged more disgusting than are similar other-directed acts? And are self-harming acts *with* pathogen-related issues judged more disgusting than are similar other-directed acts? (b) Do these relations hold in cultures outside North America and Western Europe? (c) Are these relations relatively invariant between accidental and intentional acts?

We also asked whether self-harms are judged immoral because they are perceived as causing harm to others. Gray and colleagues proposed that immorality is not divided into different domains, but judgments of all immorality depend on perceived harm (Gray, 2014; Gray, Schein, & Ward, 2014; Gray & Wegner, 2011). Acts of self-harm provides the toughest challenge to Gray and colleagues' theory as these actions present no obvious other as victim. Perhaps even in the absence of an obvious other person as victim, people perceive harm being done to others when witnessing self-harm. In the present study, participants indicated their perception of self-harm and other-harm when reading self-harm events.

In three studies, a participant read a story in which a protagonist commits a harmful act. In Study 1, we compared self-directed with other-directed actions, separately for pathogen-related and non-pathogen-related contexts. The first problem was to avoid confounding the self-other direction distinction with story content. To do so, we used story frames with identical content within which we varied the victim of the moral transgression to be either the self or another person.

Another problem in the available evidence is assessing disgust with the label *disgust*. Other studies have suggested that *disgust* can be used metaphorically and sometimes overlaps with *anger*. The use of the word *disgust* in some contexts co-occurs with *anger* but not with *grossed-out*, whereas, in everyday speech, the phrase *grossed-out* more aptly represents disgust reaction associated with pathogen-related issues (Hutcherson & Gross, 2011; Nabi, 2002). For example, people use both *disgust* and *anger* to denote their emotional reaction to someone stealing, but they use both *disgust* and *grossed-out* to denote their emotional reaction to someone stamping in a pool of vomit (pathogen-related disgust). Therefore, when examining the disgust reaction to self-directed actions, it is important to keep in mind that the word *disgust* sometimes overlaps in meaning with *anger* and sometimes with *grossed-out*. Ideally, if a violation of a purity norm elicits real disgust, the observer will report feeling both disgusted and grossed-out. To address this problem, in the present study, we included the words *disgust*, *anger*, and *grossed-out* in the emotion response scale.

In Study 1, we tested the hypothesis that the participant will find the protagonist's act more disgusting when the protagonist directs it against him or herself than against another person—and this hypothesis holds within both pathogen-related and non-pathogen-related contexts. In Study 2, we examined the hypothesis that self-harm elicits disgust both in America and in India. In Study 3, we tested the hypothesis that the participant will find the protagonist's self-harming act disgusting whether it is accidental or intentional—and that this hypothesis holds in both America and India.

Study 1: Response to Self-Harm Versus Other-harm

The first hypothesis in Study 1 was that a participant will feel more disgusted and grossed-out when reading about a self-harming act than about the same act directed at another person. Feeling disgusted or grossed-out is known to be more responsive to pathogen-related issues. Therefore, we tested the hypothesis in both pathogen-related and non-related contexts. We also compared the emotional reaction to self-harm with that of other-harm. To avoid confounding the self-other direction distinction with story content, we used story frames with identical content within which we varied the victim of the moral transgression to be either the self or another person. The second hypothesis was that self-harming actions would consequently be judged immoral.

The design of the study was 2 (target: self vs other) × 2 (context: pathogen vs non-pathogen) = 4 between-subjects cells. Each participant read one story about a protagonist who committed an act. The participant rated their

emotional reaction to the act and how immoral they judged the act to be.

Method

Participants

Americans ($N = 400$; 238 women, 162 men; $M_{\text{age}} = 32.25$ years, range: 18–62 years) were recruited through Amazon Mechanical Turk, a Web site with a large participant pool where reliable data can be obtained by recruiting participants online (Buhrmester, Kwang, & Gosling, 2011). Inclusion criteria required current residency in the USA and speaking English as a native language. A link to the survey was posted on Mechanical Turk Web site with a brief description of the study, inclusion criteria, and information on monetary compensation when the study is completed. The additional qualification option on Mechanical Turk was used to recruit participants only in USA. The number of participants required for a link at a time was limited to a number below 10 to ensure a more diverse sample. Data collection was completed in 3 days. We recruited only the required 400 participants as each of them met the inclusion criteria and had completed the survey. For each type of story, sample size was 200. The main comparison within each type of stories was between self-directed and other-directed actions (between groups) for an emotion rating. Power analysis showed that for each type of story, with a between-group comparison and 200 participants, there is 80% power for detecting a small-sized effect ($d = 0.3$) with a .05 criterion of statistical significance (two-tailed). The protocol of the study was submitted to the Boston College Institutional Review Board, and approval was obtained.

Stories

Ten story frames described actions by a protagonist named Tom. (Five of these story frames described a pathogen-related context and the other five a non-pathogen-related context.) Following a design by Chakroff et al. (2013), each of these 10 story frames had two versions such that in one version the action of the protagonist was directed at himself (self-directed) and, in the other, was directed at someone other than the protagonist (other-directed). Thus there were 20 stories in all. “Appendix A” provides the story frames, and the two versions for each story frame.

Emotion Response Scale

The response format had five emotions: disgust, grossed-out, anger, sadness, and happiness. Participants could

choose as many or as few emotions as they wanted by clicking “yes” or “no” for each. For any emotion that was clicked “yes,” the participant was asked to rate its intensity on a 7-point scale (ranging from 1—*barely* to 7—*extremely*). Thus the possible range of score for each emotion was 0–7, with 0 when emotion was not felt and the score on the intensity scale if the emotion was felt.

Immorality Scale

For each story, there was a response scale to indicate the immorality of the protagonist’s (Tom) behavior. Participants could choose whether the action was immoral by clicking “yes” or “no.” If clicked “yes,” the participant was asked to show how much on a 7-point scale (ranging from 1—*slightly* to 7—*highly*). Thus, the possible range of score for immorality was 0–7, with 0 when the action was judged not immoral and the score on the rating scale if the action was judged immoral.

Self-harm and Other-Harm Scales

For each story, there were two additional response scales used as manipulation checks: (a) how much the action harmed Tom himself, and (b) how much the action harmed someone other than Tom. Participants could choose whether the action harmed the protagonist or someone other than the protagonist by clicking “yes” or “no” for the respective response scales. For any scale that was clicked “yes,” the participant was asked to show how much on a 7-point scale (ranging from 1—*slightly* to 7—*highly*). Thus the possible range of scores for each response scale was 0–7, with 0 if the behavior did not harm the protagonist or did not harm someone other than the protagonist, and the score on the rating scale if the behavior harmed the protagonist or harmed someone other than the protagonist.

Design

There were two types of story frames (pathogen-related vs non-pathogen-related), and each type of story frame consisted of five individual story frames. Thus, there were 10 (2×5) story frames in all. Each story frame was varied to have two targets (self versus other). Thus, there were 20 stories in all.

Procedure

Participants were randomly assigned to one of the 20 stories. Thus, each participant read only one story, then used the emotion response scale to indicate their emotional reaction to the protagonist’s (Tom) action in that story, and

finally completed the immorality, self-harm, and other-harm scales.

Results and Discussion

Manipulation Check on Target-of-Harm Rating

Participants agreed that the self-directed stories depicted harm to self more than to someone else, whereas other-directed stories depicted harm to someone else more than to the self. This result held for both pathogen-related and non-pathogen-related stories. In an analysis of variance with target (self vs other) and context (pathogen-related vs non-pathogen-related) as between-subject variables and harm rating (self-harm vs other-harm) as within-subject variable, there was a significant three-way interaction—target \times context \times harm rating, $F(1, 396) = 12.69$, $p < .00$. Follow-up analysis of variance with target and harm rating showed a significant target \times harm rating interaction for pathogen-related stories, $F(1, 198) > 17.65$, $p < .001$ and for non-pathogen-related stories, $F(1, 198) = 192.06$, $p < .001$. Further follow-up of these two-way interactions with paired-sample t tests within each target showed a similar and predicted pattern of harm rating. For pathogen-related stories: for self-directed action, self-harm ratings ($M = 3.28$, $SD = 2.56$) were significantly greater than other-harm ratings ($M = 2.66$, $SD = 2.69$), and for other-directed action, other-harm ratings ($M = 5.66$, $SD = 2.18$) were significantly greater than self-harm ratings ($M = 2.81$, $SD = 2.94$). For non-pathogen-related stories: for self-directed acts, self-harm ratings ($M = 5.46$, $SD = 1.97$) were significantly greater than other-harm ratings ($M = 3.41$, $SD = 2.76$), and for other-directed acts, other-harm ratings ($M = 6.02$, $SD = 1.79$) were significantly greater than self-harm ratings ($M = 2.52$, $SD = 2.68$).

Immorality

Participants judged other-harm as well as, more importantly, self-harm to be immoral. In single-sample t tests, participant mean immorality rating within each target-of-harm and within each context of violation was significantly above a floor effect: for non-pathogen-related stories: self-harm ($M = 2.24$, $SD = 2.75$) and other-harm ($M = 4.93$, $SD = 2.78$) and for pathogen-related stories: self-harm ($M = 2.64$, $SD = 2.88$) and other-harm ($M = 5.63$, $SD = 2.17$), $t(99) > 4.51$, $ps < .001$.

Self-harm acts were less immoral than other-harm acts, and non-pathogen acts were less immoral than pathogen-related acts. In an analysis of variance on the immorality rating with target (self vs other) and context (pathogen-related vs non-pathogen-related) as between-subject

variables, there was a significant effect for target, $F(1, 396) = 113.94$, $p < .001$, $\eta^2 = .22$ and for context, $F(1, 396) = 4.27$, $p = .039$, $\eta^2 = .01$, but not for target \times context interaction, $F(1, 396) = 0.32$, $p = .573$. For the effect of target, immorality rating in the other-harm acts ($M = 5.28$, $SD = 2.51$) was greater than that in the self-harm acts ($M = 2.44$, $SD = 2.82$). For the effect of context, immorality rating in pathogen-related stories ($M = 4.13$, $SD = 2.95$) was greater than that in non-pathogen-related stories ($M = 3.59$, $SD = 3.07$).

Comparisons Among Emotions

To test the hypothesis that self-harms are disgusting, we compared different emotions within self-directed acts separately for pathogen-related and non-pathogen-related stories. Emotion ratings, ignoring the individual stories, were compared by means of paired-sample t tests with Bonferroni correction. Table 1 shows the mean rating for each of the five emotions.

There was no support for the prediction that self-harm acts elicit disgust. Self-harm acts were predominantly associated with disgust only for pathogen-related stories, and not for non-pathogen-related stories. For pathogen-related stories, disgust was not significantly different from grossed-out, $p = 1$; both disgust and grossed-out ratings were significantly greater than those for each of the other emotion, $ps < .001$. However, for non-pathogen-related stories, sadness ratings, not disgust ratings, were modal and significantly greater than ratings for each of the other emotions, $ps < .005$.

Even for other-harm acts, where anger was the predicted emotion, pathogen-related actions elicited more disgust. For pathogen-related stories, disgust was modal and not significantly different from anger, $p = .236$, but significantly greater than each of the other emotions, $ps < .007$. Anger was not significantly different from grossed-out, $p = 1$. For non-pathogen-related stories, anger was the modal emotion, but not significantly different from disgust or sadness, $p = 1$, but was significantly greater than each of the other emotions, $ps < .005$.

The comparison among emotions also revealed a broader pattern (Table 1). Moral violations, self- or other-harm, elicited a range of negative emotional reactions. For each violation, ratings for happiness were significantly lower than ratings for each of the other negative emotions (with the only exception that for non-pathogen-related self-harm acts, happiness and grossed-out were not significantly different).

Table 1 Mean (and standard deviation) of ratings for emotions for self-harm and other-harm acts separately, Study 1

Target	Disgust	Grossed-out	Anger	Sadness	Happiness
<i>Pathogen-related stories</i>					
Self-harm	4.77_a (2.40)	4.73 _a (2.49)	2.13 _b (2.46)	2.21 _b (2.49)	0.21 _c (0.96)
Other-harm	5.77_a (1.83)	5.19 _b (2.32)	5.33 _{ab} (2.17)	3.73 _c (2.72)	0.39 _d (1.39)
<i>Non-pathogen-related stories</i>					
Self-harm	2.15 _b (2.71)	0.83 _c (1.86)	1.93 _b (2.49)	3.27_a (2.67)	0.32 _c (1.25)
Other-harm	4.76 _a (2.72)	2.05 _b (2.75)	5.02_a (2.43)	4.81 _a (2.39)	0.23 _c (1.07)

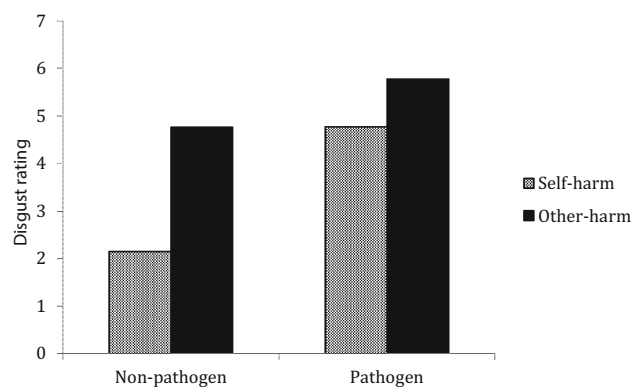
Means on an 8-point scale (0—*not at all* to 7—*extremely*). The mean values in each condition are the average across five stories. For emotion, mean values in bold indicate the modal emotion for a condition. Different subscripts on mean values for each row for emotion indicate a significant difference, based on paired-sample *t* tests with Bonferroni correction

Emotion as a Function of Conditions

The effect of target and context on disgust, grossed-out, and anger ratings were examined. As pathogen-related exposure is disgusting (Curtis & Biran, 2001), we anticipated a main effect of pathogen-related context for disgust and grossed-out, such that pathogen-related violations are more disgusting and grossed than non-pathogen-related violations. Similarly, we also anticipated a main effect for target, such that self-harm acts are more disgusting and grossed than other-harm acts, whereas other-harm acts are more angering than self-harm acts. (See supplement for the results of an analysis examining the effect of target on disgust, grossed-out, and anger ratings considering the individual stories in pathogen-related and non-pathogen-related contexts.)

Disgust

As predicted, pathogen-related violations were more disgusting than non-pathogen-related violations. However, contrary to the prediction, self-harm actions were *less* disgusting than other-harm actions. Analysis of variance on disgust rating with target (self vs other) and context (pathogen-related vs non-pathogen-related) as between-subject variables, there were significant main effects for context, $F(1, 396) = 55.31, p < .001, \eta^2 = .12$, and target, $F(1, 396) = 54.70, p < .001, \eta^2 = .12$, and a significant target \times context interaction, $F(1, 396) = 10.88, p = .001, \eta^2 = .03$. Pathogen-related stories ($M = 5.27, SD = 2.19$) were more disgusting than non-pathogen-related stories ($M = 3.46, SD = 3.01$). Other-harm acts ($M = 5.27, SD = 2.37$) were more disgusting than self-harm acts ($M = 3.46, SD = 2.89$). Further analysis of the significant target \times context interaction showed that for pathogen-related and non-pathogen-related stories separately, other-harm acts were significantly more disgusting than self-harm acts (Fig. 1).

**Fig. 1** Disgust rating as a function of target and context, Study 1

Grossed-Out Pathogen-related violations were more gross than non-pathogen-related violations; and self-harm acts, contrary to the prediction, were *less* gross than other-harm acts. Analysis of variance on grossed-out ratings with target (self vs other) and context (pathogen-related vs non-pathogen-related) as between-subject variables, there were significant main effects for target, $F(1, 396) = 12.48, p < .001, \eta^2 = .03$, and context, $F(1, 396) = 219.24, p < .001, \eta^2 = .36$, but no significant target \times context interaction, $F(1, 396) = 2.55, p = .111$. Pathogen-related stories ($M = 4.96, SD = 2.41$) were more gross than non-pathogen-related stories ($M = 1.44, SD = 2.42$). Other-harm acts ($M = 3.62, SD = 2.99$) were more gross than self-harm acts ($M = 2.78, SD = 2.94$).

Anger Other-harm acts were more angering than self-harm acts, but anger rating did not differ significantly between pathogen-related and non-pathogen-related violations. Analysis of variance on anger ratings with target (self vs other) and context (pathogen-related vs non-pathogen-related) as between-subject variables, there was a significant main effect for target, $F(1, 396) = 172.40, p < .001, \eta^2 = .30$, but not context, $F(1, 396) = 1.13, p = .288$, and

no significant target \times context interaction, $F(1, 396) = 0.05$, $p = .819$. Other-harm acts ($M = 5.18$, $SD = 2.31$) were more angering than self-harm acts ($M = 2.03$, $SD = 2.48$). Pathogen-related stories ($M = 3.73$, $SD = 2.82$) were not significantly more angering than non-pathogen-related stories ($M = 3.48$, $SD = 2.90$).

Correlational Analysis

Results so far encouraged a more exploratory approach to the data. Rottman et al. (2014) found correlations to be revealing. Our design was not intended to yield data easily analyzed by correlations, but when story frame is ignored, the sample sizes overall and within condition provided revealing results. Overall ($N = 400$), immorality was correlated with rated other-harm ($r = .54$, $p < .05$), but not with rated self-harm ($r = .00$, n.s.). This pattern was held within each condition separately ($N = 200$): Immorality was correlated with rated other-harm more than with rated self-harm for the other-harm condition ($r_s = .41$ and $.11$) and for the self-harm condition ($r_s = .39$ and $.24$). Predicting immorality from emotion was more problematic because of high multicollinearity among negative emotions. The single highest correlation for the other-harm condition was with anger, whereas that for self-harm condition was with disgust.

Summary

There was no support for that hypothesis harmful actions are just as immoral when directed against the self as against another. There was also no support for the hypothesis that self-harm elicits disgust when self-harm is not coupled with pathogens. Self-harm elicited a range of negative emotions. The predominant emotional reaction to self-harm, when lacking in pathogens, was sadness. In addition, self-harms were less gross and disgusting than other-harms. Self-harm was immoral, but less so than other-harm. Correlational analysis suggested that self-harms are immoral to the extent that they imply harming others.

Study 2: Response to Self-harm: Americans Versus Indians

In Study 1, we examined the case in which an observer witnesses someone harming him or herself. We had suggested that the observer judges the event as a violation of a purity norm and therefore judges the event as immoral and disgusting. This hypothesis did not fair well. The concept of a distinct purity moral domain was inspired by studies in India (Shweder et al., 1987, 1997). Yet, our data in Study 1 were gathered in North America. In Study 2, we return to

India to re-examine the hypothesis that witnessing someone harming him or herself elicits disgust and is judged immoral.

In Study 1, we used stories that we had written ourselves. Perhaps these stories were limited in exemplifying self-harm: In the car-buying story, the person performing the immoral action was the salesman and not Tom. In the HIV self-directed story, the morally at-fault person may not be very evident. To rectify such issues in Study 2, we based our stories more directly on previous literature and relied on stories used by Chakroff et al. (2013) to exemplify self-harm. We borrowed five stories that had minimal pathogen involvement.

Another critique of the extant body of evidence is that many of the examples of a purity violation were “atypical (i.e., weird, strange, unusual)” (Gray & Keeney, 2015, p. 860). Perhaps the violations were judged disgusting, at least in part, because of their atypicality. Thus, in Study 2, we tried to lessen the strangeness confounded with the harm to self of the action. Specifically, we relied on stories used by Chakroff et al. (2013) to exemplify the purity domain, but, for each story, we provided more context to make the act seem less strange. For example, one of Chakroff et al.’s stories was: “Steven accidentally punched himself in the ribs.” We revised it as “while practicing boxing, Tom accidentally punched himself in the ribs.”

American and Indian participants read seven stories: five self-harm stories—actions directed at the protagonist himself. In addition, participants also responded to two test stories—a pathogen-related story and a positive story. Actions involving exposure to pathogen-related issues are reliably known to elicit disgust, and the positive story a positive emotion, thus providing a comparison for the emotional reactions to alleged purity violations. For each story, the participant indicated their judgment of immorality, and their emotional reaction to the protagonist’s action by rating the intensity of each of five emotions: disgust, grossed-out, anger, sadness, and happiness.

Method

The method is the same as in Study 1 except as noted.

Participants

Eighty participants were from two cultural groups: Americans were native English speakers ($N = 40$; 16 women, 24 men; $M_{\text{age}} = 32.43$ years, range: 18–57 years), and Indians were native Malayalam speakers ($N = 40$; 35 women, five men; $M_{\text{age}} = 19.73$ years, range: 18–26 years). Americans, as in Study 1, were recruited through Amazon Mechanical Turk. Indians were undergraduate students from St. Xavier’s College, Thumba. The first author of this paper, a

native Malayalam speaker, entered class rooms and announced the study. Questionnaire was given to those willing to participate. Fifty students were approached for the required number of 40. The data collection was completed in a day. At the suggestion of the ethics committee of St. Xavier's college, individual participants were not financially compensated. Instead, again at the suggestion of the ethics committee of St. Xavier's college, the first author of this paper engaged a group of students on some topics of research methodology. Power analysis showed that with 40 participants in each cultural group and a within-group comparison between two emotion ratings, there is 80% power for detecting a medium-sized effect ($d = 0.5$) with a .05 criterion of statistical significance (two-tailed). The study was approved by the Boston College Institutional Review Board. The study in St. Xavier's college was also approved by the institution's ethics committee.

Stories

There were seven stories: five self-harm stories (stories depicting actions with the protagonist himself harmed) and two test stories (a positive story and a pathogen-related story). Our stories were modeled after Chakroff et al. (2013), but changed slightly to provide more contexts so that their accidental nature was explicit and were made less unusual or weird. "Appendix B" provides the stories.

Translation

The questionnaire with stories, instructions, and response scales was translated into Malayalam for Indians, using the translation-back-translation method. A bilingual speaker in Malayalam translated the English questionnaire into Malayalam. Another bilingual, who had not read the original English version, back-translated the translation. Back translation largely agreed with the original English version. Discussions between the translator and the back-translator resolved the few inconsistencies. We maintained the protagonist name Tom, as it is a common name in Malayalam.

The words used for *disgust*, *grossed-out*, *anger*, *sadness*, and *happiness* in Malayalam were *veruppu*, *arrappu*, *deshyam*, *sankadam*, and *santhosham*, respectively (Kollareth & Russell, 2017a).

Procedure

Participants received the seven stories in one of two orders: For half of the participants, the order was the same but had been chosen randomly; for the other half, the order was the reverse. Participants were asked to read each story and indicate their emotional reaction to the protagonist's (Tom)

action using the emotion response scale. For each story, the participant also completed the immorality, self-harm, and other-harm scales.

Results and Discussion

For convenience, the results are presented as if all participants responded in English.

The five self-harm stories were treated as items. We averaged each response variable across the five self-harm stories for each participant. Our decision was justified by the adequate reliabilities for the disgust, self-harm, and immorality ratings. Cronbach's α s for these response variables ranged from .62 to .88. Cronbach's α for *grossed-out* for Americans was .89, but for Indians, there was insufficient variance in the data and thus no measure of reliability: for four of the five items, all responses were 0. For anger, sadness, and happiness, Cronbach's α s ranged from .51 to .85.

Manipulation Check on Target-of-Harm Rating

Participants agreed that self-harming actions depicted harm to the self more than harm to someone else for the set of five self-harm stories. In an analysis of variance with culture (American vs Indian) as a between-subject variable and target-of-harm rating (self vs other) as a within-subject variable, there was a significant main effect for target-of-harm, $F(1, 78) = 238.34$, $p < .001$, $\eta^2 = .75$, and for culture, $F(1, 78) = 4.90$, $p = .030$, $\eta^2 = .06$, and a significant culture \times target-of-harm interaction, $F(1, 78) = 7.18$, $p = .009$, $\eta^2 = .08$. For the main effect of target-of-harm, self-harm was greater than other-harm. For the main effect of culture, Indians had a greater harm rating (average of self vs other-harm rating) than Americans. However, the significant target-of-harm \times culture interaction showed that in independent sample t test, self-harm rating did not significantly differ between Americans ($M = 3.90$, $SD = 1.53$) and Indians ($M = 3.96$, $SD = 1.14$), $t(78) = 0.17$, $p = .868$, whereas other-harm-rating was significantly greater for Indians ($M = 1.49$, $SD = 0.34$) than for Americans ($M = 0.39$, $SD = 0.75$), $t(78) = 32.92$, $p < .001$.

Immorality

Americans did not find the self-harm acts to be very immoral, and Indians found them to be only somewhat immoral. In single-sample t tests, participant mean immorality rating (on a scale from 0 = *no* to 7 = *highly*) for Americans was (0.38), significantly below a floor effect (1.0), $t(39) = 3.48$, $p = .001$. For Indians, the mean immorality was moderate (1.87) and significantly above 1.0, $t(39) = 3.48$, $p = .001$. In addition, in an independent

sample *t* test, immorality rating for Indians ($M = 1.83$, $SD = 1.50$) was significantly greater than that for Americans ($M = 0.38$, $SD = 0.75$), $t(78) = 5.46$, $p < .001$.

Comparison Among Emotions

For the two test stories, the predicted emotions—happiness for the positive story and disgust for the pathogen-related story—were significantly greater than any other emotion. Paired-sample *t* tests with Bonferroni correction showed that for the positive story, for both the cultural groups, happiness was modal and significantly greater than each of the other emotions, $ps < .001$. For the pathogen-related story, again for both the cultural groups, grossed-out was the modal emotion. For Americans, grossed-out was not significantly different from disgust, $p = .338$, but each of them was significantly greater than each other emotion, $ps < .001$; for Indians, grossed-out was significantly greater than each of the other emotions, $ps < .025$. Table 2 shows the mean and standard deviation of each emotion rating for the test stories and self-harm stories in each cultural group. These results indicate that both groups of participants were responding appropriately to the experiment.

By contrast to the test stories, the prediction for self-harming actions—that they would elicit feeling disgusted or grossed-out more than other emotions—was not supported. The modal emotion was sadness. In an analysis of variance with culture (2 levels: American v. Indian) as between-subject variable and emotion rating (5 levels: anger, disgust, grossed-out, sadness, and happiness) as within-subject variable, there was no significant main effect for culture, $F(1, 78) = 3.44$, $p = .067$, but a significant main effect for emotion, $F(4, 312) = 45.63$, $p < .001$, $\eta^2 = .37$, and a significant culture \times emotion interaction, $F(4, 312) = 23.85$, $p < .001$, $\eta^2 = .23$.

For the main effect of emotion, the emotion with the highest overall rating for self-harm was sadness, significantly greater than each of the other emotions, $ps < .001$. For both cultural groups, sadness, not the predicted disgust, was significantly greater than each of the other emotions, $ps < .038$. For both cultural groups, neither disgust nor grossed-out was significantly different from happiness, $ps > .171$. For Americans, disgust or grossed-out was not significantly different from anger, $ps > .183$, but for Indians, anger was significantly greater than disgust or grossed-out, $ps < .001$ (Table 2).

Correlational Analysis

Following the results of Study 1, we examined correlations. Overall ($N = 80$), the immorality of the combined set of self-harm stories was significantly correlated with rated other-harm ($r = .63$, $p < .05$). Although the sample size within each culture was small, a similar result was obtained: $r = .49$ for American sample; $r = .55$ for Indian sample.

Summary

We studied five self-harming actions taken from a previous study to illustrate purity moral violations. However, the predicted emotion of feeling disgusted or grossed-out was not modal; instead, sadness was modal. In addition, the self-harming actions were only slightly immoral. A similar pattern was found in America and India. Correlational analysis suggested that the immorality of the self-harming actions was related to the rated harm to others.

Table 2 Mean (and standard deviation) rating for emotions for each story-type (test stories and self-harm stories), Study 2

Story-type	Culture	Emotion				
		Disgust	Grossed-out	Anger	Sadness	Happiness
Positive (test)	American	0.10 _b (0.50)	0.13 _b (0.65)	0.10 _b (0.50)	0.18 _b (0.81)	4.35_a (2.19)
	Indian	0.00 (0.00)	0.13 _b (0.79)	0.00 (0.00)	0.27 _b (1.26)	6.07_a (1.72)
Pathogen (test)	American	2.08 _a (2.46)	2.75_a (2.16)	0.27 _b (0.88)	0.25 _b (0.81)	0.22 _b (0.80)
	Indian	0.18 _c (1.11)	3.65_a (2.64)	0.05 _c (0.32)	1.53 _b (2.26)	0.00 (0.00)
Self-harm	American	0.83 _b (1.30)	0.74 _b (1.35)	0.51 _b (0.98)	1.52_a (1.47)	0.31 _b (0.86)
	Indian	0.18 _c (0.48)	0.09 _c (0.34)	1.69 _b (1.14)	2.87_a (1.71)	0.26 _c (0.66)

Means on an 8-point scale (0—no to 7—extremely). The mean value for the self-harm story-type is the average across five stories. Different subscripts on mean values for each row indicate a significant difference, based on paired-sample *t* tests with Bonferroni correction. For emotion, mean values in bold indicate the modal emotion for a story-type. $N = 80$; 40 in each cultural group

Study 3: Response to Accidental Versus Intentional Self-harm

In a final study, we tested the prediction that the perceived immorality and disgust of self-harm is relatively insensitive to the perpetrator's intention. We also sought a systematic replication of the findings of Study 2. In Study 2, the cultural samples were poorly matched: Americans were recruited from the general population through Mechanical Turk, whereas Indians were undergraduate students. Thus, in Study 3, we recruited both the cultural groups through Mechanical Turk.

In Study 3, we contrasted accidental and intentional harms to self. And, if intentionality does have an effect, then the accidental nature of the actions in Study 2 might have been responsible for the failure to find support for the hypotheses. Perhaps, intentional self-harming actions might be more immoral and more likely to elicit a feeling of disgust.

Method

The method is the same as in Studies 1 and 2 except as noted.

Participants

One hundred and thirty-two participants were from two cultural groups: Americans were native English speakers residing in the USA ($N = 66$; 39 women, 27 men; $M_{\text{age}} = 36.58$ years, range: 18–64 years), and Indians were native Malayalam speakers residing in India ($N = 66$; 14 women, 52 men; $M_{\text{age}} = 32.02$ years, range: 18–51 years). All participants were recruited through Amazon Mechanical Turk. The additional qualification option on Mechanical Turk was used to recruit participants only in USA for Americans and in India for Indians. In addition, as a screening question, participants answered a simple math question presented in words to ensure that Americans were speakers of English and Indians were speakers of Malayalam. Six Americans and 32 Indians failed the screening question. The number 66 in each sample is the N after excluding those who failed the screening question. The data collection was completed in 3 weeks. The main interest of comparison was between intentionality (accidental vs intentional) for each emotion within a cultural group. Power analysis showed that for each emotion, with a between-group comparison and 66 participants, there is 80% power for detecting a medium-sized effect ($d = 0.5$) with a .05 criterion of statistical significance (two-tailed). The study was approved by the Boston College Institutional Review Board.

Stories

The accidental self-harm stories were the same five used in Study 2. Study 2 showed that these stories clearly represented self-harm acts (self-harm rating was well above other-harm rating). For each, we constructed an intentional version. That is, we treated the gist of each story as a story frame and for each story frame made two versions, such that in one version the protagonist harmed himself accidentally and, in the other, the protagonist harmed himself intentionally. “Appendix C” provides the two versions for each of the five story frames.

Results and Discussion

For convenience, the results are presented as if all participants responded in English.

As in Study 2, the five self-harm stories were treated as items. We averaged each response variable across the five self-harm stories for each participant. Our decision was justified by the adequate reliabilities for the disgust, grossed-out, self-harm, and immorality ratings. Cronbach's α for these response variables, separately for accidental and intentional self-harming actions within each cultural group, ranged from .58 to .82. Cronbach's α for anger, sadness, and happiness, ranged from .53 to .91.

Manipulation Check on Target-of-Harm Rating

Participants agreed that the self-harming actions depicted harm to the self more than harm to someone else. In an analysis of variance with intentionality (accidental vs intentional) and culture (American vs Indian) as between-subject variables, and target-of-harm rating (self vs other) as a within-subject variable, there was a significant main effect for target-of-harm, $F(1, 128) = 385.38$, $p < .001$, $\eta^2 = .78$, and for culture, $F(1, 128) = 14.13$, $p < .001$, $\eta^2 = .11$. For the main effect of target-of-harm, self-harm ($M = 4.43$, $SD = 1.59$) was greater than other-harm ($M = 0.98$, $SD = 1.47$). This pattern was true when self-harm versus other-harm ratings were compared for accidental and intentional self-harms separately within each cultural group. For the main effect of culture, Indians had a greater harm rating (average of self vs other-harm rating) than Americans. Main effect for intention and none of the interaction effects were significant, $ps > .066$.

Immorality

Intentional self-harming acts were perceived as more immoral than accidental self-harming acts in both the cultural groups. In an analysis of variance on immorality rating with intentionality (accidental vs intentional) and

culture (American vs Indian) as between-subject variables, there were significant main effects for intentionality, $F(1, 128) = 16.98$, $p < .001$, $\eta^2 = .13$, and culture, $F(1, 128) = 37.63$, $p < .001$, $\eta^2 = .25$, but no significant intentionality \times culture interaction, $F(1, 128) = 0.25$, $p = .616$. Intentional harms ($M = 2.40$, $SD = 1.86$) were more immoral than accidental harms ($M = 1.26$, $SD = 1.73$). Indian participants ($M = 2.81$, $SD = 1.94$) gave greater immorality ratings to the stories than did American participants ($M = 1.06$, $SD = 1.43$). As in Studies 1 and 2 and other past research, accidental self-harm was perceived as only slightly to moderately immoral (Smetana, Jambon, & Ball, 2014). Table 3 shows the mean and standard deviation of immorality rating for intentional versus accidental self-harm for each cultural group.

Comparison Among Emotions

The pattern of emotion ratings differed depending on the cultural group. In an analysis of variance with intentionality (accidental vs intentional) and culture (American vs Indian) as between-subject variables, and emotion (5 levels: anger, disgust, grossed-out, sadness, and happiness) as within-subject variable, there was no significant main effect for intentionality, $p = .885$, but each of the other main effects and all interaction effects were significant, $ps < .003$.

For the main effect of emotion, the emotion with the highest overall rating for the self-harm events was sadness, significantly greater than each of the other emotions, $ps < .001$. For the main effect of culture, Americans gave on average lower emotion ratings than did Indians. In subsequent analyses, we explore the emotion \times intentionality interaction for each cultural group separately.

Americans For Americans, there was a significant main effect for emotion, $F(4, 256) = 35.97$, $p < .001$, and intentionality, $F(1, 64) = 7.55$, $p = .008$, $\eta^2 = .36$, but only a marginal emotion \times intentionality interaction, $F(4, 256) = 2.21$, $p = .068$. Table 4 shows the mean and standard deviation of emotion rating for intentional versus accidental self-harm for Americans. All emotion ratings

were greater for intentional than accidental self-harms, and the interaction was due to the size of the difference. Comparison between intentionality—*independent sample t tests*—separately for each emotion showed that for disgust, grossed-out, and anger, intensity rating was significantly greater in intentional than in accidental self-harm, but for sadness and happiness, again intensity rating was greater in intentional than in accidental self-harm, but not significantly so. Happiness might have been a floor effect, but sadness not. If replicated, this result suggests that sadness and not disgust is invariant with intentionality.

For Americans, as in the overall analysis, sadness and not the predicted disgust or grossed-out was the modal emotion. Comparison among emotions—*paired-sample t tests with Bonferroni correction*—separately for intentional and accidental self-harms showed that in both self-harms, sadness was the modal emotion, and significantly greater than each of the other emotions. Happiness was significantly lower than each of the other emotions, with the only exception that in accidental self-harm anger and happiness were not significantly different (Table 4).

Indians For Indians, there was a significant main effect for emotion, $F(4, 256) = 44.26$, $p < .001$, $\eta^2 = .48$, but not intentionality, $F(1, 64) = 2.98$, $p = .091$. There was also a significant emotion \times intentionality interaction, $F(4, 256) = 12.58$, $p < .001$, $\eta^2 = .21$. Table 5 shows the mean and standard deviation of emotion rating for intentional versus accidental self-harm for Indians. The effect of intentionality was dependent on the emotion. Comparison between intentional and accidental—*independent sample t tests*—separately for each emotion showed that for sadness and anger, intensity was greater in accidental than in intentional self-harm, but for disgust, grossed-out, and happiness, there was no significant difference between them.

Comparison among emotions—*paired-sample t tests with Bonferroni correction*—separately for intentional and accidental self-harms showed that in accidental self-harm, sadness was the modal emotion, and significantly greater than each of the other emotions. In intentional self-harm, anger was modal but not significantly different from

Table 3 Mean (and standard deviation) rating for immorality for accidental vs intentional self-harms in cultural groups, Study 3

Culture	Self-harm	
	Accidental	Intentional
American	0.38 _a (0.85)	1.74 _b (1.58)
Indian	2.33 _a (1.93)	3.40 _b (1.82)

Means on an 8-point scale (0—*no* to 7—*highly*). Different subscripts within a row indicate a significant difference based on independent sample t test. In each cultural group, $N = 66$; 33 each in accidental versus intentional self-harm

Table 4 Mean (standard deviation) intensity rating for emotion to intentional vs accidental self-harm for Americans, Study 3

	Emotion				
	Grossed-out	Disgust	Sadness	Anger	Happiness
Intentional	1.18^b (1.49)	1.61^b (1.57)	2.54 ^a (1.88)	1.42^b (1.73)	0.21 ^c (0.73)
Accidental	0.45 ^b (0.75)	0.70 ^b (1.02)	1.97 ^a (1.99)	0.36 ^{bc} (0.74)	0.13 ^c (0.60)

Means on an 8-point scale (0—no to 7—*extremely*). Different subscripts on mean values for a row indicate significant difference based on paired-sample *t* tests with Bonferroni correction. Bold mean values within a column indicate a significant difference for that emotion between accidental vs intentional self-harm. *N* = 66; 33 each in accidental vs intentional self-harm

Table 5 Mean (standard deviation) intensity rating for emotion to intentional vs accidental self-harm for Indians, Study 3

	Emotion				
	Grossed-out	Disgust	Sadness	Anger	Happiness
Intentional	1.75 ^a (1.57)	1.95 ^a (1.57)	2.02 ^a (1.62)	2.62 ^a (1.78)	0.34 ^b (0.52)
Accidental	1.63 ^c (1.99)	1.75 ^c (2.12)	4.88^a (1.78)	3.25^b (2.14)	0.22 ^d (0.57)

Means on an 8-point scale (0—no to 7—*extremely*). Different subscripts on mean values for a row indicate significant difference based on paired-sample *t* tests with Bonferroni correction. Bold mean values within a column indicate a significant difference for that emotion between accidental versus intentional self-harms. *N* = 66; 33 each in accidental vs intentional self-harm

sadness or other negative emotions. In both conditions, happiness was significantly lower than each of the other emotions (Table 5).

Correlational Analysis

Overall (*N* = 132), immorality was correlated with rated harm of others, $r = .60$. Similar correlations were found within each condition: .60 for accidental, .54 for intentional.

Summary

Feeling sad—not, as predicted, feeling disgusted or grossed-out—was the modal emotional response to events in which a protagonist harmed himself, whether the protagonist's action was intentional or accidental—with one exception. The exception was that for Indians, for intentional self-harm, anger was modal, but not significantly different from sadness. In addition, for both the cultural groups, happiness was generally lower than each of the negative emotions. However, there were cultural differences in the pattern of emotional reaction depending on whether self-harm action was intentional or accidental. For Americans, intentional self-harm elicited a more intense negative reaction than did accidental self-harm, even though for sadness, this difference was not significant. By contrast, for Indians, anger and sadness reactions were more intense when self-harm was accidental than

intentional, and other negative emotions did not significantly differ between accidental and intentional.

Judged immorality of self-harm also varied with intention. As in Studies 1 and 2, immorality was correlated with rated harm of others, and similar correlation was found within both accidental and intentional conditions.

In short, intentionality did matter in the witness's emotional reaction to and immorality judgment of self-harm violations. Similar but not identical patterns were found in America and India.

General Discussion and Conclusion

In three studies, we examined the reactions of someone hearing about a person harming him or herself. We examined 10 different stories in which self-harm was contrasted with other-harm, and 5 stories just of self-harm. Our participants did not report reacting in the way we anticipated based on current theorizing in moral psychology (Moral Foundation Theory): We did not find that self-harming acts elicit disgust and are judged to be immoral, or that the witness's emotional reactions and judgments as to morality were invariant with the intention of the violator.

Self-harm acts neither elicited disgust nor were found immoral in any notable way: American participants found self-harm actions to be *less* disgusting and *less* immoral than other-harm actions (Study 1). Both American and Indians participants found self-harm actions *barely* disgusting and immoral (Study 2). And, changing the nature

of the story from accidental to intentional had a large impact on both the emotional reaction and their perceived morality (Study 3).

Admittedly, the definition of “purity” in the moral realm remains obscure. Despite widespread adherence to purity as a distinct moral domain (Dungan et al., 2017; Graham et al., 2013; Haidt, 2003; Herz & Hinds, 2013; Horberg et al., 2009; Hutcherson & Gross, 2011; Rottman et al., 2014; Rozin & Haidt, 2013; Russell & Giner-Sorolla, 2013), the domain is poorly characterized. An alternative interpretation of what theorists meant by a purity norm is that the norm requires avoidance of pathogen-related substances, whether directed at self or other. In this case, what we labeled “pathogen-related” might have been labeled “purity violations.” Even with this adjustment, however, our results did not support what would be expected. Namely, in Study 1, pathogen-related stories re-named as “purity violations” failed to support our hypothesis that self-directed violations elicit feeling more disgusted and grossed-out than do other-directed violations. Others have showed that pathogen-related exposure—even when not immoral—elicits disgust (Kayyal, Pochedly, McCarthy, & Russell, 2015; Royzman, Leeman, & Baron, 2009).

Our findings more generally cast doubts on accounts that specify a single discrete emotion for each distinct domain of moral violations. Perhaps morality cannot be divided into domains based on their association with emotions. In our results, moral violations, whether self or other-directed, elicited a range of negative emotions. According to Gray and colleagues, all moral violations are associated with negative emotion, and the specific emotion endorsed depends on incidental details of the situation rather than immorality per se (Cameron, Lindquist, & Gray, 2015; Gray & Keeney, 2015; Schein, Ritter, & Gray, 2016). Other findings support the view that morality cannot be divided into domains based on their association to emotions: Irrespective of moral domains, non-pathogen-related violations were associated with anger and violations having coincidental disgusting substances with disgust (Kollareth & Russell, 2017b; Royzman, Atanasov, Landy, Parks, & Gepty, 2014).

Yet another challenge for the theory of distinct moral domain was the correlational evidence that judgments of immorality of self-harm acts depended on perceived other-harm. This finding is consistent with Gray and colleague’s theory that judgments of immorality depend on perceived harm (Gray, 2014; Gray et al., 2014; Gray & Wegner, 2011).

Culture was a factor in self-harms being immoral. Specifically, self-harms were more immoral for Indians than for Americans: Both accidental and intentional self-harms were more immoral for Indians than for Americans. Perhaps the greater immorality would lend some support

for our characterization of the purity domain, but limited to Indians. However, as we said, Indians did not find these slightly immoral self-harms to be disgusting. Further, there might be other explanations for the judgment of immorality: Indians, compared to Americans, also perceived these actions as harming another person. Perhaps this difference in the perception of other-harm might explain the difference in the perception of immorality. Alternatively, the cultural difference in immorality might result from a broader use of the concept of immorality for Indians. In one study, Hindi- and Malayalam-speaking Indians found clearing one’s throat in public much more immoral than did Americans (Kollareth & Russell, 2017b). Consistently in another study, Americans linked the word *immorality* to harming another person, whereas Chinese linked the word to incivility (Buchtel et al., 2015).

Cultural differences in emotional reaction call for further explanation. Sadness was the typical emotional reaction across the cultural groups. However, whether an act is intentional or accidental changed the emotional reaction depending on the culture. For Americans, intentional self-harm elicited a more intense negative reaction than did accidental self-harm, even though for sadness, this difference was not significant. By contrast, for Indians, anger and sadness reactions were more intense when self-harm was accidental than intentional, and other negative emotions did not significantly differ between the intentionality conditions. This cultural difference in the pattern of emotional reaction is not easily explained. One recent study showed substantial variation across cultures in the effects of intent on moral judgment (Barrett et al., 2016). More cross-cultural data on the effect of intention of moral judgments would help to clarify the pattern found in the present study.

Our results suggest to us that the search for universal moral domains needs to be complemented with an appreciation of culture-specific folk theories of morality. Differences across cultures may be deeper than sometimes recognized. Recall the writing of Shweder et al. (1997), which inspired the notion of a moral domain based on purity. For the residents of India studied by Shweder et al., the purity domain (termed divinity domain by Shweder et al.) was part of a culture-specific ideology. The basic idea is that the world is permeated with a divine and sacred order. The self is a spiritual entity connected to a divine order with the obligation to maintain that order. Thus, violations of purity/divinity include events and their consequences specific to that worldview. Here are some examples of acts judged to be violations: A widow wears jewelry 6 months after the death of her husband. A young girl falls in love with and marries a man whose job is to collect the garbage. A person eats beef. A widow eats fish. And, a day after the birth of his first child, the father enters a temple to pray. In turn, purity violations will lead to later

misfortune, with no intervening causal mechanism. For example, death is often attributed to moral failings, rather than medical problems. The concept of karma implies that a moral transgression inevitably brings about suffering.

Further, our results highlight a problem in distinguishing the moral emotion of disgust from anger. Some suggested meaningful differences between disgust and anger in response to the content of moral violation: disgust is responsive to purity violations, and anger to autonomy violations (Rozin et al., 1999; Horberg, Oveis, & Keltner, 2011); disgust is responsive to abnormal use of the body, and anger to violations of injustice (Piazza, Russell, & Sousa, 2013; Russell & Piazza, 2015). Young and colleagues' proposal was an integration of such differing views: purity-of-self is linked to disgust and harm of other is linked to anger (Chakroff et al., 2013; Rottman et al., 2014; Young & Tsoi, 2013). However, in our study self-harms were not linked to disgust. Recent proposals go beyond suggesting unique links between moral content and emotions: Disgust is elicited in response to information about moral character, whereas anger, in response to information about the moral wrongness and consequences of the action (Giner-Sorolla & Chapman, 2017). Disgust is geared to condemnation or avoidance of wrong doers, whereas anger functions to protect the self from immoral acts (Hutcherson & Gross, 2011; Molho, Tybur, Guler, Balliet, & Hofmann, 2017). More research is needed to clarify what distinguishes disgust from anger. Meanwhile, others have pointed to a metaphorical use of the word *disgust*, questioning the status of disgust as a distinct moral emotion (Danovitch & Bloom, 2009; Herz & Hinds, 2013; Nabi, 2002; Royzman & Kurzban, 2011).

Our findings were limited in many ways. The acts of self-harm were presented as written stories. It might be argued that stories more vividly presented would yield different results. It would be worthwhile to examine film clips. On the other hand, prior evidence advanced as demonstrating the existence of a purity domain were based on written stories, and the same critique ought to apply to those studies as well.

We used a small sample of acts of self-harm, and it might be argued that other acts, even when not confounded with pathogen-related issues, would be found disgusting and immoral. We look forward to proponents of the purity domain advancing such stories. Others do suggest that morality consists of not just behaviors that impact others but also oneself (Janoff-Bulman & Carnes, 2013). On the other hand, even if some other acts of self-harm are found disgusting and immoral, the question would remain why those acts fit the theory of the purity domain, whereas the acts of self-harm studied here did not.

We assessed emotions using emotion words. Perhaps other measures of emotion, such as facial expressions,

neural measures, physiological or behavioral reactions, would suggest a different conclusion. We also did not assess whether the participants tended toward orthodox or progressive outlook. One previous study showed that orthodox participants place more emphasis on the ethics of purity (Jensen, 1998).

The notion of a distinct purity domain is challenged by our findings. The challenge calls for changes to the notion of a purity domain, but what changes is difficult to anticipate. Perhaps the purity domain can be subsumed by a different domain. Perhaps it is limited to certain cultures or even individuals. Or perhaps it will disappear altogether.

Appendix A: The Two Versions for Each Story Frame in Study 1

Non-pathogen Stories

(Story 1)

Self-directed: One day, very disappointed in how his life is going, Tom decides not to take the prescribed medicine for his fatal, but non-contagious, liver disease.

Other-directed: One day, very disappointed in how his life is going, Tom decides not to give his child the prescribed medicine for the child's fatal, but non-contagious, liver disease.

(Story 2)

Self-directed: One day, very disappointed by everything, Tom eats a cyanide tablet to kill himself.

Other-directed: One day, very disappointed by everything, Tom gives a cyanide tablet to his child to kill the child.

(Story 3)

Self-directed: Tom is buying a used car for himself, with his own hard-earned money. The car salesman pretends to be Tom's friend and convinces them that an old run-down car is just right. The car is greatly overpriced. Still Tom pays the full price.

Other-directed: Tom is buying a used car for his aged father, with his father's hard-earned money. The car salesman pretends to be Tom's friend and convinces them that an old run-down car is just right. The car is greatly overpriced. Still Tom pays the full price.

(Story 4)

Self-directed: One day, Tom buys an illegal pill, a stimulant. Tom takes it and can't sleep the whole weekend. On Monday morning, he is extremely tired but must go to his work.

Other-directed: One day, Tom buys an illegal pill, a stimulant. Tom feeds it to his friend by lying; he said it's aspirin. The friend can't sleep the whole weekend. On Monday morning, the friend is extremely tired but must go to his work.

(Story 5)

Self-directed: Tom has high cholesterol and his doctor had told him to do regular exercise. But Tom decides not to do any exercise.

Other-directed: Tom's wife has high cholesterol and her doctor had told her to do regular exercise. But Tom decides not to allow her to do any exercise.

Pathogen stories

(Story 6)

Self-directed: One day, very disappointed in his marriage, Tom has consensual sexual intercourse with his own sister.

Other-directed: One day, very disappointed in his marriage, Tom forces his own sister to have sexual intercourse with him.

(Story 7)

Self-directed: One day, as a joke, Tom urinated on himself.

Other-directed: One day, as a joke, Tom urinated on another person.

(Story 8)

Self-directed: Bruce has HIV. Bruce lets Tom know about the HIV, but Tom then has sex with Bruce.

Other-directed: Tom has HIV. Tom does not let Bruce know about the HIV, and Tom has sex with Bruce.

(Story 9)

Self-directed: Feeling lazy, Tom repeatedly lets his dog defecate on his own porch. He never cleans it up.

Other-directed: Feeling lazy, Tom repeatedly lets his dog defecate on his neighbor's porch. He never cleans it up.

(Story 10)

Self-directed: As a joke, Tom takes a pill that makes him vomit at a dinner party. He feels nauseous and dehydrated.

Other-directed: As a joke, Tom slips a pill into a friend's drink that makes the friend vomit at the dinner party. The friend feels nauseous and dehydrated.

Appendix B: Stories in Study 2

Self-harm Stories

1. One day, Tom was trying to walk blindfolded and he smashed his nose against a door.
2. One day, for fun, Tom jumps from a high building and sprains his ankle.
3. One day, distracted by something, Tom hits his own head hard against a brick wall.
4. One day, while working, Tom accidentally cut himself on the arm with a sharp knife.
5. One day, while practicing boxing, Tom accidentally punched himself in the ribs.

Test Story: Positive Story

1. One day, Tom helps an old lady to cross the road.

Test Story: Pathogen Story

1. One day, while walking on the road, Tom accidentally stamps on dog poop.

Appendix C: The Two Versions for Each Story Frame in Study 3

Story 1

Accidental: One day, Tom needed to use the bathroom in an unfamiliar hotel. He walked in the dark and smashed his nose against a door.

Intentional: One day, Tom wanted to arouse sympathy in his girlfriend. So, he decided to walk blindfolded and smashed his nose against a door.

Story 2

Accidental: One day, for fun, Tom jumps from a high building and sprains his ankle.

Intentional: One day, to avoid the military draft, Tom jumps from a high building in order to sprain his ankle.

Story 3

Accidental: One day, distracted by something, Tom hits his own head hard against a brick wall.

Intentional: One day, very disappointed in himself, Tom deliberately hits his own head hard against a brick wall.

Story 4

Accidental: One day, while working, Tom accidentally cut himself on the arm with a sharp knife.

Intentional: One day, Tom deliberately cut himself on the arm with a sharp knife.

Story 5

Accidental: One day, while practicing boxing, Tom accidentally punched himself in the ribs.

Intentional: One day, while practicing boxing, Tom wanted to prove his manliness. He punched himself in the ribs.

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