Many people judge suicide to be immoral. We have found evidence that these moral judgments are primarily predicted by people's belief that suicide taints the soul and by independent concerns about purity. This finding is inconsistent with accounts that define morality as fundamentally based upon harm considerations. In this commentary, we respond to a critique of our finding, and we provide further support for our original conclusions. Even when applying new exclusion criteria to our data, an examination of effect sizes demonstrates that concerns about purity robustly and meaningfully explain variance in moral judgments of suicide. While harm concerns sometimes predict moral judgments of suicide alongside purity concerns, they reliably explain a much smaller proportion of the variance than do purity concerns. Therefore, data from six studies continue to suggest that the relevance of harm concerns for moral judgments of suicide is substantially overshadowed by the contribution of purity concerns.
Gray (2014) suggests that our removal of very rapid responders means that we have excluded participants who are answering most intuitively and are therefore most likely to perceive harm in immoral actions. This is unlikely, as reaction time was uncorrelated with assessments of harm (for Study 1, \( r = .01 \)). Also, a median split between “fast” and “slow” participants shows that faster responders were not more likely to perceive a correlation between immorality and harm (for Study 1, \( f_{\text{fast}} = .29 \); \( f_{\text{slow}} = .45 \)). Moreover, extremely fast reaction times are generally a poor proxy for intuitive responding (Evans, Dillon, & Rand, 2014).

Gray (2014) additionally finds a bivariate outlier that is an overly influential point in one of the six studies reported in our paper. Because the participant in question passed attention checks, and because her responses were sensible and internally consistent, we believe this data point represents a rare but valid observation in the Study 1 population rather than a contaminant. More importantly, post hoc selection can be a worrisome practice, and therefore in all of our studies we excluded participants solely on the basis of a priori decisions. By determining appropriate sample sizes and exclusion criteria before running analyses, our findings were insulated from motivated biases.

### 3. Comparison of effect sizes

As Gray (2014) notes, significance testing uses a somewhat arbitrary threshold as a heuristic for identifying a true positive result. He cites Cumming (2014), who asserts that effect sizes are more useful and interpretable. Indeed, a predictor variable is not necessarily meaningful if it is statistically significant but explains a relatively minor proportion of the unique variance in an outcome variable. For this reason, effect size testing is becoming an increasingly popular method for measuring a variable’s impact, and therefore we reported effect sizes for all variables in Studies 1 and 2 of our paper (Rottman et al., 2014). Here, we present squared semi-partial correlations (indicating the unique contribution of each predictor variable), using Gray’s suggested exclusion criteria (see Figs. 1 and 2). Consistent with our original exclusion criteria, these new analyses omitted non-American participants and participants who failed attention checks. However, participants were no longer excluded based upon reaction times, while data points with high Mahalanobis distances were omitted. We employed a conservative cutoff value of \( p < .001 \) to identify these outliers, and we considered all variables in each regression analysis rather than searching for bivariate outliers (Tabachnick & Fidell, 2013).

Even applying these new exclusion criteria, an examination of effect sizes continues to indicate that purity-based concerns explain a more substantial proportion of variance in moral judgments of suicide than harm-based concerns. A meta-analysis combining data from all six studies reveals that purity judgments explain 34.5% of the total variance \( (f^2 = .61) \), compared to 5.6% of total variance explained by harm judgments \( (f^2 = .10) \). This difference is even more pronounced when comparing effect sizes of scores on the Purity and Harm subscales of the Moral Foundations Questionnaire; a meta-analysis with data from all four studies employing this questionnaire finds that MFQ Purity explains 30.3% of variance in moral judgments of suicide \( (f^2 = .44) \), while MFQ Harm explains 0.0% of this variance \( (f^2 = .00) \). Given Cohen’s (1992) guidelines that “small,” “medium,” and “large” effect size indexes for \( f^2 \) are .02, .15, and .35, respectively, the results of these meta-analyses demonstrate that harm has a small-to-medium effect in explaining moral judgments of suicide, while purity has a consistently large effect. Across both measurements of these variables, harm is therefore a considerably less important construct than purity in accounting for variation in moral judgments of suicide.

### 4. Conclusion

The hypothesis that all moral judgments can be explained by reference to harm (Gray, Schein, & Ward, in press; Gray, Young, & Waytz, 2012) is interesting and provocative, and we agree that harm concerns can illuminate a great deal of moral psychology. Yet moral judgments are multifaceted (e.g., Greene, 2013; Sinnott-Armstrong & Wheatley, 2014; Young & Dungan, 2012), and our study is one of many that have demonstrated the rich plurality of the moral mind (see Graham et al., 2013; Haidt, 2012). There is room for consilience between these views, however. For example, it is possible that certain moral judgments are driven by assessments of purity but consistently lead to later perceptions of harm (Gray et al., 2014).
in press). In sum, it would be damaging for moral psychologists to ignore harm, but it would also be sullying to ignore purity.

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References


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