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Utilitarian preferences or action preferences? De-confounding action and moral code in sacrificial dilemmas☆

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ABSTRACT

A large literature in moral psychology investigates utilitarian versus deontological moral preferences using sacrificial dilemmas (e.g., the Trolley Problem) in which one can endorse harming one person for the greater good. The validity of sacrificial dilemma responses as indicators of one's preferred moral code is a neglected topic of study. One underexplored cause for concern is that standard sacrificial dilemmas confound the endorsement of specific moral codes with the endorsement of action such that endorsing utilitarianism always requires endorsing action. Two studies show that, after de-confounding these factors, the tendency to endorse action appears about as predictive of sacrificial dilemma responses as one's preference for a particular moral code, suggesting that, as commonly used, sacrificial dilemma responses are poor indicators of moral preferences. Interestingly however, de-confounding action and moral code may provide a more valid means of inferring one's preferred moral code.

1. Introduction

In recent decades, psychology and neuroscience have increasingly turned their attention to the study of moral judgment. One of the most common methods used to study moral judgment entails presenting hypothetical sacrificial dilemmas in which participants choose whether to endorse harming one person in service of a greater good (e.g., Bartels, 2008; Greene, Sommerville, Nystrom, Darley, & Cohen, 2001). Responses to such dilemmas are frequently used to infer people's relative preferences for utilitarian (i.e., impartial welfare-maximizing) versus deontological (i.e., rights- or duty-based) moral codes (e.g., Lee & Gino, 2015). Such is the level of interest in sacrificial dilemma research that it has even penetrated debates in normative ethics on the relative merits of deontological and utilitarian moral codes (Berker, 2009; Greene, 2003; Singer, 2005).

Despite widespread popularity as measures of moral preferences, there has been a notable lack of research on the construct validity of sacrificial dilemmas as indicators of people's preferred moral code (i.e., whether sacrificial dilemmas can be considered a valid measure of utilitarian vs. deontological preferences). Although sacrificial dilemma responses are frequently still framed as "utilitarian" or "deontological" choices (Lee & Gino, 2015), recent studies suggest that responses to sacrificial dilemmas do not correlate with other variables in ways expected of a measure of utilitarian versus deontological preferences (Bartels & Pizarro, 2011; Bauman, McGraw, Bartels, & Warren, 2014; Duke & Bègue, 2015; Kahane, Everett, Earp, Farias, & Savulescu, 2015; Rosas & Koenigs, 2014). We aim to further this line of research by addressing a largely unexamined issue concerning the construct validity of sacrificial dilemmas: the confounding of the endorsement of utilitarian outcomes with the endorsement of action.

1.1. Confounding action and moral code in sacrificial dilemmas

In standard sacrificial dilemmas, participants choose between two options: *acting* to uphold a "utilitarian" moral code, or *omitting action* to uphold a "deontological" moral code (see Supplementary materials for examples). Thus, the distinctions between endorsing utilitarian and deontological moral codes, and acting versus omitting (referred to as "Moral Code" and "Action" for short) are often perfectly confounded. On no occasion, to our knowledge, have these factors been thoroughly teased apart. Without such de-confounding, it is impossible to know whether responses to these dilemmas are driven by Action- versus Moral Code-related preferences (or both).[1]

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[1] While previous studies of the action vs. omission effect (e.g., Cushman, Young, & Hauser, 2006) are suggestive of Action as an important influence on moral judgment, such findings address a qualitatively different question: whether, on average, people judge harmful omissions more favourably than harmful actions. We, on the other hand, ask what proportion of people responding consistently with a given moral code in an action dilemma will respond consistently with *the same moral code* in an omission dilemma.

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An important implication of this confound is that previous research demonstrating a relationship between some predictor (e.g., emotion, reward sensitivity, or behavioral disinhibition) and sacrificial dilemmas responses (Choe & Min, 2011; Moore, Stevens, & Conway, 2011; Pastötter, Gleixner, Neuhauser, & Bäuml, 2013; Seidel & Prinz, 2012; Strohminger, Lewis, & Meyer, 2011; Valdesolo & Desteno, 2006; van den Bos, Müller, & Damen, 2011), may instead be demonstrating a relationship between that predictor and Action (i.e., willingness to endorse intervention in a situation, irrespective of the implied moral code). Critically, if Action (even partly) drives responses to sacrificial dilemmas, existing results cannot be unambiguously interpreted as reflecting psychological processes underlying the application of, or preferences for, specific Moral Codes. The problem for the field of moral psychology is that the extent to which Action, rather than Moral Code, drives responses to sacrificial dilemmas, remains unknown.

Although this confound has been acknowledged in previous work (Baron, Scott, Fincher, & Emlen Metz, 2015; Conway & Gawronski, 2013), only one study has given it any kind of empirical treatment. Baron et al. (2015) presented two studies in which standard sacrificial dilemmas are administered alongside another set of dilemmas (called "rule dilemmas") in which participants judged the moral acceptability of *two different actions*: one in which a rule was actively followed, producing a bad outcome, and the other in which a rule was actively broken, producing a (relatively) better outcome. While proponents of standard sacrificial dilemmas would expect a strong positive correlation between the two, across these two studies, Baron et al. observe correlations between these two sets of dilemmas of just 0.20 and 0.31. The small correlations suggest that the standard dilemmas and rule dilemmas may be measuring separate but related constructs (thus affirming concerns about the Action confound). However, the implications of these findings are unclear. Because the two sets of dilemmas were not closely matched on other characteristics (e.g., the nature of the scenario and the magnitude of the consequences of the response options), it is possible that the correlation between these two sets of dilemmas may have been attenuated by other differences between the sets.

1.2. The present studies

A necessary first step in addressing the inferential issues outlined above is to de-confound Action and Moral Code. To achieve this, we conducted two studies in which participants responded to both (a) standard sacrificial dilemmas which required participants to judge the acceptability of performing a sacrificial action themselves (i.e., the "utilitarian" responses required action), and (b) subtly modified versions of the same dilemmas in which participants judged the moral acceptability of stopping a third person from performing the sacrificial action (i.e., the "utilitarian" response required omission). Thus, across the two versions of the same dilemma, responding consistently for one dimension (e.g., Moral Code) *required* responding inconsistently for the other (Action).

To illustrate, imagine two people: a "utilitarian" whose responses are driven by a utilitarian moral code, and an "interventionist," whose responses are driven by a preference for intervening in moral situations. Both prefer flipping the switch to save lives in the original Trolley Problem, but in the modified Trolley Problem, their responses diverge: the utilitarian should prefer allowing somebody else to flip the switch, whereas the interventionist should prefer stopping the other person from flipping the switch.[2] If standard sacrificial dilemmas were valid indicators of one's preferred moral code (a hypotheses we refer to as the "utilitarian hypothesis" for short), we would expect the manipulation of Action (i.e., whether action or omission leads to the "utilitarian" response) to have minimal effect on participants' preferred moral code within two variants of the same dilemma. If, however, participants endorsed different moral codes in different versions of the same dilemma (i.e., they were influenced by Action), our confidence in the utilitarian hypothesis would be undermined.

2. Method

Given the substantial overlap between the methods employed in the two studies, we report all methods and results together.

2.1. Participants

Participants (Study 1 $N = 120$; Study 2 $N = 308$) were United States residents recruited via Amazon's Mechanical Turk (Buhrmester, Kwang, & Gosling, 2011; Mason & Suri, 2012). One participant from Study 1, and two from Study 2 were excluded for providing incomplete data. Additionally, 24 participants were excluded from Study 2 for failing at least one of two attention-checks (see Supplementary materials). The final sample for Study 1 was 119 (26.1% female, 73.1% male, 0.8% unspecified; $M_{age} = 30.24$, $SD_{age} = 11.75$) and 282 (43% female, 56.6% male, 0.4% unspecified; $M_{age} = 34.81$, $SD_{age} = 11.18$), for Study 2.

3. Materials

3.1. Sacrificial dilemmas

In both studies, after providing informed consent, each participant responded to two versions of three sacrificial dilemmas based on the set of Moore et al. (2008; see Supplementary materials). For *standard* dilemmas, utilitarian moral code was aligned with acting (as is typical in sacrificial dilemma research). In the *modified* dilemmas, the number of people at risk, victim characteristics and means of sacrifice were identical to those of the corresponding standard dilemma, however a bystander was about to perform the sacrificial action, and participants decided the moral acceptability of actively *stopping the bystander* from performing the sacrifice (rather than judging the acceptability of performing the sacrifice themselves). Thus, in this set of dilemmas, utilitarian moral code was aligned with *omission*. The core features of both dilemma sets are summarized in Fig. 1.

Standard and modified dilemmas were presented in separate blocks with block order randomized. Participants reported how "morally acceptable" they judged action (i.e., either enacting the sacrifice or stopping the bystander from enacting the sacrifice) on a 1 (Absolutely unacceptable) to 6 (Absolutely acceptable) scale.[3]

4. Results

4.1. Correlational analyses

As a first step, we computed correlations between acceptability judgments for all three dilemma pairs across both studies. Whereas the utilitarian hypothesis would predict strong negative correlations between responses to each dilemma pair, the six correlations ranged from −0.02 to −0.19, with an average of −0.12 (similar to Baron et al., 2015).

[2] Note that this prediction concerns consistency *within* two versions of the same dilemma (e.g., comparing responses to the standard and modified versions of the Trolley Problem), rather than *across* different dilemmas.

[3] An additional set of three modified dilemmas was included in Study 2 for exploratory purposes. In this set, instead of having a bystander about to perform the sacrifice, there was a third person who was about to inadvertently cause their own death in a way that would result in the group's lives being spared. Participants were asked whether it was morally acceptable to actively stop the person from accidentally ending their own life. The pattern of results from these dilemmas (presented in the Supplementary Materials) is essentially the same as for the modified dilemmas reported in the manuscript. A number of other individual difference variables were measured in Study 2 for an unrelated research project.

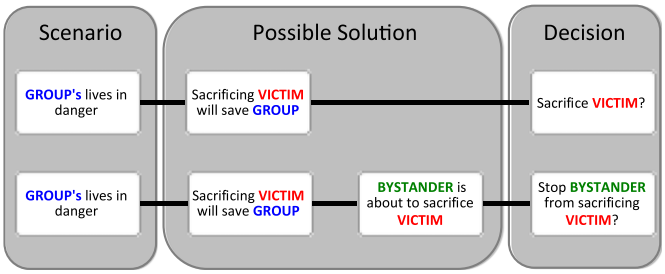

Fig. 1. Core features of standard sacrificial dilemmas (top row) and modified sacrificial dilemmas (bottom row).

4.2. Distinguishing sensitivity to action vs. moral code

To better understand the apparent inconsistency in participants' responses, our primary analysis entailed a form of Observation Oriented Modeling (see Grice, Barrett, Schlimgen, & Abramson, 2012) in which we examined the overall pattern of each participants' responses in relation to the utilitarian hypothesis (i.e., whether responses were driven by moral code). Specifically, we created a single measure of participants' response patterns in three steps, as follows. First, each response was dichotomized such that scale points 1–3 (i.e., the "unacceptable" side of the scale) were coded as rejection, and 4–6 (i.e., the "acceptable" side of the scale) coded as endorsement.[4] Second, we categorized participants' responses *within* each dilemma pair, coding whether participants (a) responded consistently based on Action (e.g., by endorsing action for both versions of the same dilemma), or (b) responded consistently based on Moral Code (e.g., by endorsing the utilitarian response in both versions of the same dilemma). Third, we categorized participants according to the consistency of their responses *across* dilemmas by coding whether they were (a) sensitive to acting in all three dilemma pairs (Action group), (b) sensitive to moral code in all three dilemma pairs (Moral Code group), or (c) gave mixed responses that fitted neither (a) nor (b) (Mixed group). Importantly, responding consistently based on Moral Code does not necessarily imply endorsing the same moral code (e.g., always "utilitarian") *across all* dilemmas. Likewise, responding consistently based on Action does not necessarily imply endorsing the same action (e.g., always acting) *across all* dilemmas. On this view, consistency merely implies responding based on the same dimension (Moral Code or Action) *within each dilemma pair*. For example, participants could conceivably give "utilitarian" responses to both variants of the Trolley Problem, and the "deontological" responses to both versions of the other two dilemmas, and thus be coded as someone who responds based on Moral Code because they endorsed consistent moral codes *within* each dilemma pair.[5]

4.3. Assessing response pattern frequencies

The proportion of participants in each response pattern group is summarized in Fig. 2. For our primary analyses, we examined response pattern grouping by performing separate chi-squared tests (using Cohen's *w* to measure effect size) for both studies, testing the null hypothesis of uniformly distributed group sizes (i.e., that participants are equally likely to consistently respond based on Moral Code, Action, or neither).[6] According to the utilitarian hypothesis, we would expect to find a substantially larger proportion of participants responding on the basis of Moral Code than Action (or neither Moral Code nor Action).

In Study 1, we failed to reject the null hypothesis of equal group sizes ($\chi^2(2) = 0.27$; $p = 0.87$; $w = 0.05$). Participants were no more likely to respond on the basis of Moral Code than on the basis of Action, or some combination of the two (as can be seen in Fig. 2, left panel).

For Study 2, while we did observe significant differences in group sizes ($\chi^2(2) = 26.57$; $p < 0.001$; $w = 0.31$), the differences were clearly driven by the large number of participants in the Mixed group (see Fig. 2, right panel). Follow-up pairwise chi-squared tests (again, with a null hypothesis of evenly sized groups) comparing the size of each pair of groups revealed that the Mixed group was significantly larger than both the Action ($\chi^2(1) = 22.33$; $p < 0.001$; $w = 0.33$) and Moral Code group ($\chi^2(1) = 13.07$; $p < 0.001$; $w = 0.25$). Most importantly, there was no significant difference between the size of the Moral Code and Action groups ($\chi^2(1) = 1.32$; $p = 0.25$; $w = 0.09$).[7]

For this lattermost comparison, the sizes of Moral Code and Action groups (*N*s of 67 and 81, respectively) afforded us the ability to detect effects of at least $w = 0.23$ with a power of 0.80. While such effect sizes are typically regarded as small to medium, we would argue that the utilitarian hypothesis rests upon a *strong implicit assumption* of a large effect of Moral Code. Thus our analyses were not underpowered for our particular aim.

4.4. Testing an alternative explanation

Because deontological moral codes are concerned with whether or not specific moral obligations are followed (rather than the actual *content* of those obligations), we cannot rule out the possibility of participants responding according to different deontological moral codes that give rise to different response patterns. Thus an alternative explanation for the lack of a difference between the sizes of the Action and Moral Code groups is that participants could have responded consistently according to a deontological moral code in a way that is not captured by the coding scheme outlined above (and were thus placed in the Mixed or Action groups despite consistently applying their own moral code). For example, while some participants could be adhering to the prescriptive rule "prevent killing under all circumstances" (which would result in placement in the Moral Code group), others could plausibly (though perhaps improbably) adhere to a pair of proscriptive rules such as "do not kill," and "do not interfere in other people's affairs" in the modified dilemmas (which would result in placement in the Action group).

While this ambiguity applies to inferences regarding deontological moral judgments, the same does not apply in the case of utilitarian judgments. Thus an alternative approach to testing the utilitarian hypothesis that sidesteps the issues outlined above is to restrict analyses to participants who chose the "utilitarian" response in a given standard dilemma, examining what proportion of those participants *also* gave the utilitarian response to the modified version of that dilemma. Here, the utilitarian hypothesis would predict that a substantial majority of utilitarian responders in a given standard dilemma would *also* give the utilitarian response in the modified version. Thus we conducted six binomial tests (one per dilemma pair per study), reported in Fig. 3, to

[4] While aware of statistical concerns about dichotomization (MacCallum, Zhang, Preacher, & Rucker, 2002), our primary hypotheses *explicitly* concern the binary distinction between endorsing vs. not endorsing action, rather than the strength of participants' endorsement, making dichotomization appropriate.

[5] In our analyses, we do not examine the proportion of participants endorsing the same moral code (e.g., uniformly utilitarian) *across* dilemma pairs because the payoffs (i.e., number of lives saved) differ between (but not within) dilemma pairs. Thus, participants in the Moral Code group could plausibly respond in a manner consistent with a particular utility function *without* endorsing the same moral code *across* sets. It is important to bear in mind, however, that if outcomes were matched across dilemma pairs, consistency within dilemma pairs would still be a necessary condition for overall consistency. Hence our grouping scheme can be interpreted as, at a minimum, capturing whether participants meet a *necessary condition* for responding consistently based on Moral Code (or Action).

[6] For completeness, we note that this null hypothesis of 1/3 of participants in each group is different to the null hypothesis of completely random responding. Random responses would result in a 1/8 chance each of being assigned to either the Moral Code or Action group, and a 3/4 chance of being assigned to the Mixed group. This null hypothesis of random responding was resoundingly rejected in both Study 1 ($\chi^2(2) = 122.36$; $p < 0.001$; $w = 1.01$) and Study 2 ($\chi^2(2) = 116.37$; $p < 0.001$; $w = 0.64$).

[7] We believe the larger proportion of people in the Mixed group in Study 2 versus Study 1 is most likely explained by greater participant fatigue (from the longer study) causing more inconsistent responses.

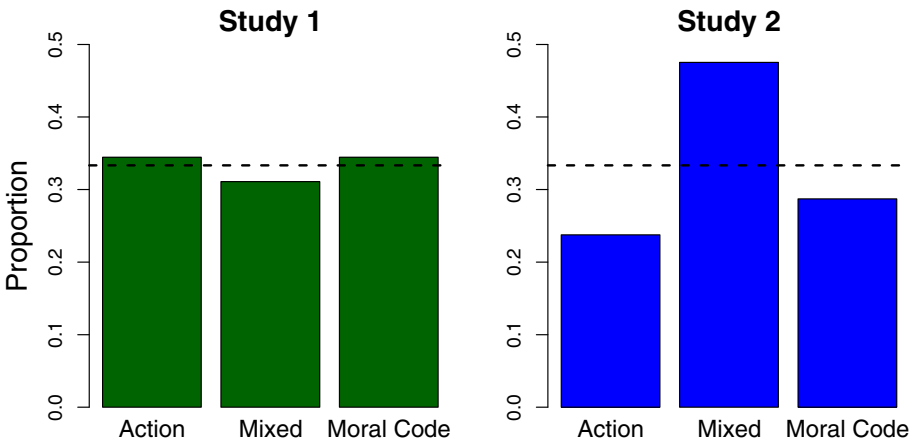

Fig. 2. Proportion of participants in each response pattern group by study. Dashed black line denotes even group sizes.

test whether the proportion of participants giving the utilitarian response to the standard version of a dilemma who *also* gave the utilitarian response to the modified version was greater than chance (i.e., >50%, as the utilitarian hypothesis would predict).

Once again, the results at best provide weak support for the utilitarian hypothesis. In Study 1, for all three dilemmas, participants who gave the utilitarian response in a standard dilemma gave the utilitarian response in the modified version at rates only just above chance, such that no effect would survive a Bonferroni correction where $\alpha = 0.017$. Moreover, the statistical significance of dilemma pairs one and two were contingent on the number of decimal places to which one rounded the lower confidence interval. For the more highly powered Study 2, the comparable subset of participants only gave utilitarian responses at above chance in the third dilemma pair. In other words, at best, only a small majority of participants respond in a way consistent with the utilitarian hypothesis, while a substantial minority do not.

4.5. Supplementary analyses

For Study 2, we collected additional data using a different set of modified dilemmas. Analyses of this additional data (described in the Supplementary Materials) corroborate the findings reported above.

5. Discussion

Over the last decade, there has been a proliferation of studies employing sacrificial dilemmas to examine the psychological and biological factors underlying preferences for utilitarian versus deontological moral codes. The aim of this paper was to explore a largely overlooked confound built into standard sacrificial dilemmas: the confounding of Action (endorsing action versus inaction) and Moral Code (endorsing a utilitarian versus deontological moral code). Across two studies we found that, after de-confounding Action and Moral Code, preferences for utilitarian vs. deontological moral codes appear no more (or at best only slightly more) predictive of sacrificial dilemma responses than preferences for action vs. inaction.

5.1. Implications and future research

Most importantly, along with other recent studies (Bauman et al., 2014; Kahane et al., 2015), our findings cast further doubt on the status of standard sacrificial dilemmas as valid measurements of moral preferences. Put simply, if respondents are not unambiguously more sensitive to Moral Code than they are to Action, it is doubtful that one can rely upon standard sacrificial dilemmas to draw inferences about who is more "utilitarian" (and under what circumstances).

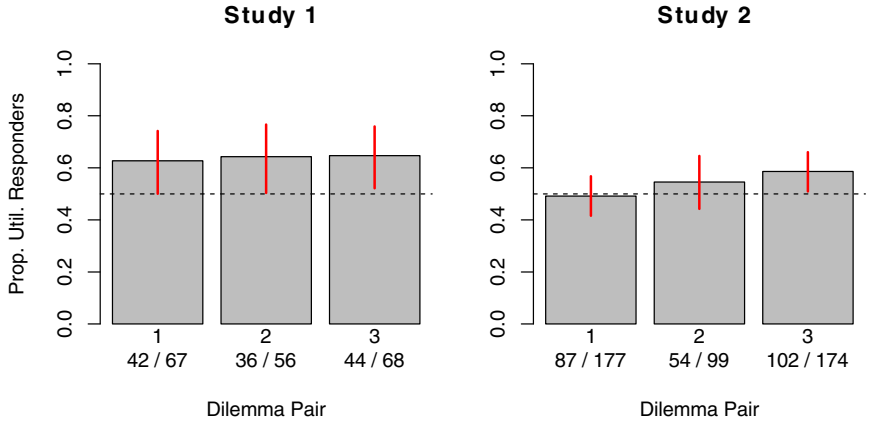

Fig. 3. Proportion of utilitarian respondents in each standard dilemma that also gave the utilitarian response to the corresponding modified dilemma. Each bar represents a separate dilemma pair; Red bars represent 95% CIs; Black dashed line represents chance; Numbers below each bar represent dilemma pair (first row), and the number of participants giving the utilitarian response to (a) both versions, and (b) the standard version of a dilemma pair.

A critical question following from such findings is how one ought to interpret the existing sacrificial dilemma literature. Previous research has linked factors such as reward sensitivity (Moore et al., 2011) and positive emotion (Valdesolo & Desteno, 2006) to more "utilitarian" responses. Insofar as these factors produce heightened tendency towards disinhibited (i.e., action-oriented) behavior, they may in fact be irrelevant to people's preferred moral code. An obvious direction for future research is thus to replicate existing effects after deconfounding Action and Moral Code.

We must also consider the broader question of whether sacrificial dilemmas can adequately measure moral preferences at all. At first glance, our findings paint a pessimistic picture, however we arrive at a slightly different conclusion to Kahane et al. (2015). We agree with Kahane et al. that, even if standard sacrificial dilemmas *do* measure concern for the greater good, it is certainly clear that that is not the *only* thing they measure. However, our results suggest that one could *potentially* achieve more valid measurement of moral preferences using deconfounded dilemma sets. For example, in our studies, about one third of participants responded consistently on the basis of Moral Code. A profitable line of future research may be to describe the people who fit into this group based on various cultural and psychological variables.[8] Moreover, by focusing attention *within* this subpopulation, researchers may be able to use sacrificial dilemmas to productively examine the psychological factors underlying different moral codes. Nonetheless, such an approach would still require thorough validation.

Finally, we note that the concerns about sacrificial dilemmas raised in this paper and elsewhere apply specifically to their construct validity as measures of one's preferred moral code. The use of sacrificial dilemmas as measurements of other moral constructs such as harm aversion may not be as problematic, especially given the presence of converging evidence from independent methods (Crockett et al., 2015; Miller, Hannikainen, & Cushman, 2014).

6. Conclusion

Despite the widespread use of sacrificial dilemmas to measure people's relative preferences for utilitarian versus deontological moral principles, recent studies have highlighted a concerning lack of evidence for their validity for such purposes. We showed that responses to sacrificial dilemmas seem just as likely to be driven by action preferences as by moral preferences. As well as providing further cause for concern about the validity of sacrificial dilemmas, our findings raise the possibility that the confounding of Action and Moral Code may have driven some previous findings. Given the available evidence, claims based on sacrificial dilemmas about the processes underlying utilitarian moral judgment now appear tenuous. Future attempts to study utilitarian moral preferences may be best served by employing alternative methods, or focusing on the validity of sacrificial dilemmas.

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[8] Candidate variables might include some of those already in the sacrificial dilemma literature such as behavioral (dis)inhibition, as well as other variables such as moral competence (Lind, 2008) or the perceived extent of one's moral obligations (Baron & Miller, 2000), for which there is known cultural variability.

Appendix A. Supplementary data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.paid.2016.09.022.

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