Virtue and Moral Conduct: The Question Framing Effect in Moral Decision-Making

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Abstract

The dual-process theory of morality predicts that, compared to a moral judgment frame (focusing on moral character), a moral action frame (focusing on moral behavior) elicits greater emotional involvement in decision-makers, leading to more deontological decisions or higher norm sensitivity. Conversely, the action-based model of cognitive dissonance posits that in psychologically conflicting situations, decision-makers under a moral action frame (as opposed to a moral judgment frame) will make decisions that deviate further from deontology or exhibit lower norm sensitivity in order to reduce dissonance. The present study investigated this question-framing effect in moral decision-making through three experiments (total N = 960). Experiment 1 employed the classic moral dilemma paradigm, requiring participants to rate their approval of moral proposals under both moral judgment and moral action frames. Experiment 2 manipulated the combination of norms and outcomes—specifically, whether norms promoted or prohibited actions and whether outcomes were beneficial or harmful—using analysis of variance to examine the interactive effects of norms and outcomes on moral decision-making. Experiment 3 utilized the CNI model (Consequence, Norm and general Inaction/action preference) to dissociate outcome sensitivity, norm sensitivity, and general inaction/action preference. Collectively, the three experiments demonstrated that the moral action frame, relative to the moral judgment frame, enhanced outcome sensitivity, weakened norm sensitivity, and increased general inaction preference. Specifically, the moral action frame produced stronger utilitarian tendencies, weaker deontological tendencies, and stronger general inaction preferences compared to the moral judgment frame, thereby replicating the findings of Gawronski et al. (2017) and supporting the action-based model of cognitive dissonance. These results indicate that moral decision-making is influenced by motivational processing.

Full Text

ABSTRACT

Dual-process moral theory posits that when questions are framed in terms of moral action rather than moral judgment, people should exhibit stronger deontological tendencies or greater norm sensitivity due to heightened moral disgust aroused by sacrifice proposals (e.g., sacrificing one innocent life to save five or more others). However, the action-based model of cognitive dissonance predicts the opposite pattern: decision-makers should become less deontological or less sensitive to norms because of stronger motivation to reduce dissonance. Study 1 employed a traditional moral dilemma paradigm and found support for the action-based model' s prediction. To further investigate which factors—norm sensitivity, consequence sensitivity, or generalized action/inaction preference—drive the moral question-framing effect, Study 2 implemented a 2 (norm: proscriptive/prescriptive) × 2 (consequence: benefits greater than/smaller than costs) × 2 (frame: moral judgment/moral action) within-subject design using the Consequences-generalized Action/inaction-Norms sensitivity (CAN) algorithm. Study 3 replicated this design with the Consequences–Norms–generalized Inaction/action preferences (CNI) model. Across studies, participants showed reduced norm sensitivity, increased consequence sensitivity, and a shift from generalized action preference to generalized inaction preference when responding to moral action-framed versus moral judgment-framed questions. These findings support the action-based model of cognitive dissonance and demonstrate that moral decision-making is influenced by motivational processes. Theoretical and methodological implications are discussed.

Keywords: question-framing effect; moral decision-making; dual-process morality theory; action-based model of cognitive dissonance; CNI model; dilemma

The Motivation Process of the Moral-question Framing Effect is Explained by the Action-based Model of Cognitive Dissonance

INTRODUCTION

A classic moral dilemma requires individuals to decide whether to sacrifice one innocent person to save five or more others. Approving the sacrifice aligns with utilitarian principles (maximizing benefits) but violates deontological principles (not killing innocents), whereas disapproving does the opposite. Researchers typically ask two types of questions: "Is it morally acceptable to perform the described action?" (moral judgment frame) and "Would you perform the described action?" (moral action frame). These questions often elicit different responses—a phenomenon known as the "moral-question framing effect." Numerous studies have documented discrepancies between judgment and action choices in moral decision-making [**?**, **?**, **?**, **?**].

The moral-question framing effect is distinctive among framing effects in moral decision-making. Previous research has shown that moral decisions can be in-

fluenced by descriptive language frames [?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?]. For example, in the trolley problem, pushing a person from a bridge elicits lower moral acceptance than pressing a button to switch tracks, presumably because "pushing" evokes stronger moral disgust and emotional engagement than the more impersonal "pressing" [?]. In contrast, the moral question-framing effect holds the scenario and behavior proposal constant while varying only whether the question emphasizes behavior acceptance or execution.

Two Potential Explanations for Moral Question-Framing Effect

The first explanation derives from dual-process morality theory, which links emotional arousal to deontological decisions and rational reasoning to utilitarian decisions [?, ?, ?, ?, ?]. Various framing effects have been explained through this lens, including goal frames ("kill"vs. "save") [?, ?], action frames ("push"vs. "don't push") [?], and consequence frames ("gain"vs. "loss") [?, ?, ?, ?, ?]. Across these effects, different frames activate distinct cognitive and emotional propensities: individuals tend toward utilitarianism when rational cognition is strengthened but toward deontology when emotional arousal—particularly moral disgust—is enhanced [?, ?, ?, ?, ?]. Since moral action implementation evokes stronger emotions than moral proposal acceptance [?], dual-process theory predicts that action-framed questions should increase aversion to sacrifice and refusal of the proposal, reflecting heightened norm sensitivity.

However, Gawronski et al. [?] found partially contradictory results: individuals became less sensitive to moral norms and showed more generalized refusal of sacrifice proposals under moral action frames compared to moral judgment frames. While the discrepancy in generalized preference can be explained by dual-process theory (greater sacrifice disgust under action frames increases overall refusal), the reduced norm sensitivity cannot. This suggests the need for an alternative explanation.

The action-based model of cognitive dissonance [?, ?, ?] may provide such an alternative. In dilemma situations, individuals face potential moral violations regardless of their decision, particularly when proscriptive norms conflict with consequences where benefits exceed costs. Violations of moral principles (whether utilitarian or deontological) threaten one' s positive moral self-image, creating an ethical dissonance state that motivates dissonance reduction [?]. The action-based model specifies that negative affective states arise not from all cognitive conflicts but specifically from conflicts among cognitions with action implications that impede behavior [?]. In traditional moral dilemmas, individuals may recognize that a sacrifice proposal violates norms against killing but yields beneficial consequences, making decisions difficult. To reduce dissonance, those in action frame conditions should show greater spreading of alternatives —considering and rationalizing alternative options more extensively [?, ?, ?]. Consequently, despite overall aversion to the sacrifice proposal, action-framed individuals should be more likely to approve it than those in judgment frames.

Consider the trolley problem: a runaway trolley will kill five workers unless you press a button to divert it onto a sidetrack, killing one worker instead. Dual-process theory predicts that the action-framed question ("Would you press the button?") evokes more emotional disgust than the judgment-framed question ("Is it morally acceptable?"), leading to greater refusal under action frames. In contrast, the action-based model predicts that the action frame motivates dissonance reduction (whereas the judgment frame does not), prompting individuals to consider the beneficial alternative more thoroughly and thus refuse less under action frames. Study 1 tested these contradictory predictions.

Resolving Interpretational Ambiguities

Traditional moral dilemma paradigms suffer from interpretational ambiguities [**?**, **?**]. The binary utilitarian-deontology classification is problematic: when individuals favor pressing the button, this could reflect (a) weaker norm sensitivity, (b) stronger consequence sensitivity, or (c) a general tendency to approve proposals irrespective of norms and consequences. The traditional paradigm cannot disentangle these possibilities.

To address this limitation, researchers must experimentally manipulate both consequences (since utilitarianism presupposes consequence sensitivity) and moral norms (since deontology presupposes norm sensitivity). This requires four dilemma types [**?**, **?**]: (a) proscriptive norm opposing behavior with benefits greater than costs; (b) proscriptive norm opposing behavior with benefits smaller than costs; (c) prescriptive norm endorsing behavior with benefits greater than costs; and (d) prescriptive norm endorsing behavior with benefits smaller than costs. These constitute a 2 (norm: proscriptive/prescriptive) $\times$ 2 (consequence: benefits greater than/smaller than costs) within-subject design enabling ANOVA detection of main effects and interactions.

Based on this design, we developed the CAN algorithm to estimate three parameters representing consequence sensitivity, norm sensitivity, and generalized action/inaction preference [**?**]:

Consequence sensitivity index (C parameter) = [p(approval ratio | proscriptive norm, benefits > costs) + p(approval ratio | prescriptive norm, benefits > costs) - p(approval ratio | proscriptive norm, benefits < costs) - p(approval ratio | prescriptive norm, benefits < costs)]/2

Norm sensitivity index (N parameter) = [p(approval ratio | prescriptive norm, benefits > costs) + p(approval ratio | prescriptive norm, benefits < costs) - p(approval ratio | proscriptive norm, benefits > costs) - p(approval ratio | proscriptive norm, benefits < costs)]/2

Generalized Action/inaction preference (A parameter) = [p(approval ratio | proscriptive norm, benefits > costs) + p(approval ratio | proscriptive norm, benefits < costs) + p(approval ratio | prescriptive norm, benefits > costs) + p(approval ratio | prescriptive norm, benefits < costs)]/4

Positive C/N parameters indicate sensitivity to supporting norms/consequences, with larger values indicating greater sensitivity. A parameters greater than 0.5 indicate generalized action preference, while values below 0.5 indicate inaction preference. Non-significant C/N parameters suggest insensitivity to norms/consequences; non-significant A parameters with at least one significant C/N parameter indicate pure utilitarian or deontological attitudes; non-significance across all parameters suggests random responding. Similar subtractive strategies appear in literature [**?**], and we named our algorithm CAN to differentiate it from the CNI model.

The CNI model [**?**] also exports three similar indexes using the same 2×2 design but employs multinomial processing tree analysis [**?**]. It uses maximum likelihood estimation to derive parameters for consequence sensitivity, norm sensitivity, and generalized inaction/action preference. The model' s processing tree and probability equations are shown in Figure 1 [Figure 1: see original paper]. The CNI model has been widely applied in recent moral judgment research [**?**, **?**, **?**, **?**, **?**].

Five key differences between CAN and CNI warrant attention [**?**]:

(a) CNI assumes sequential processing (consequences → norms → general preference), whereas CAN does not. Decision-makers might consider norms first, and reversing C and N positions in CNI yields different results [**?**]. CAN avoids this a priori assumption using subtractive estimation.

(b) CNI exports group-level parameters, limiting its use in correlation/regression designs and restricting comparisons to between-group or specific value tests. CAN exports individual-level parameters, overcoming these limitations.

(c) The I parameter in CNI (generalized inaction preference) and A parameter in CAN (generalized action preference) have inverse interpretations: larger I values indicate stronger inaction preference, while larger A values indicate stronger action preference.

(d) CNI' s I parameter is dissociated from norm/consequence sensitivities, representing group preference when not driven by norms or consequences. CAN' s A parameter is not dissociated, representing individual preference including all influencing factors.

(e) CNI requires binary Yes/No responses, whereas CAN accommodates continuous designs.

Both models can be applied complementarily. Study 2 used CAN to examine which factors drive the moral question-framing effect, and Study 3 replicated this with CNI to validate CAN' s results. Before these models, the process dissociation (PD) approach [**?**] distinguished utilitarian and deontological preferences using only proscriptive norm scenarios with benefits greater or smaller than costs—situations included in both CAN and CNI. We therefore also conducted PD analyses in Studies 2 and 3.

Overview of Studies

Study 1 used a traditional moral-dilemma paradigm to test whether participants showed greater acceptance of sacrificial proposals under moral action versus moral judgment frames. Study 2 employed a 2 (norm: prescriptive/proscriptive) × 2 (consequence: benefits greater than/smaller than costs) × 2 (frame: moral judgment/moral action) within-subject design with CAN algorithm to identify which factors matter in the framing effect, while also testing Study 1's robustness and calculating U and D factors via process dissociation. Study 3 validated Study 2' s results using CNI model with binary responses, providing further validation of CAN algorithm and testing the robustness of Studies 1 and 2.

Study 1 materials were embedded in a public class quiz; other items concerned class content and were theoretically unrelated. No participants were excluded, and all measures and manipulations are reported. For Studies 2 and 3, all measures, manipulations, and exclusions have been reported.

METHOD

STUDY 1

Participants. A total of 578 university students participated (291 females; aged 18 to 23, M = 20.51, SD = 1.66) and received course credit. We calculated sample size using G*Power software. *Based on effect sizes from Gawronski et al. [**?**] (0.268 and 0.363), we set the minimum effect size at 0.2, with = 0.05 and power = 0.95, yielding a minimum sample of 327. To obtain a more stable effect size, we recruited as many participants as possible from public classes during Spring 2017. Results were not examined before terminating data collection. Sensitivity analysis (G*Power; [**?**]) indicated that with N = 578, we could detect effect sizes of d = 0.12 using standard criteria (= 0.05 two-tailed, 1- = 0.80, difference between two dependent means).

Design. We used a within-subjects design for moral question frames. After reading each dilemma and sacrifice proposal, participants answered two questions: "Is it morally acceptable to perform the described action?" (moral judgment frame) and "Would you perform the described action?" (moral action frame). Responses were made on a nine-point scale (1 = "definitely not," 9 = "definitely yes"). Ratings above the median of 5 were coded as utilitarian; ratings below 5 as deontological. Higher ratings indicated more utilitarian/less deontological orientation.

Materials and procedure. Six moral-dilemma scenarios were selected from Koenigs et al. [**?**], matched for emotional arousal and length (see Appendix 1). All scenarios showed significant moral relevance in pre-studies; pre-study participants were excluded from formal studies (see Supplemental Materials). Each dilemma was followed by a moral sacrifice proposal (e.g., "smother your child in order to save yourself and the other townspeople"). Participants answered moral judgment and action framing questions in sequence. The questionnaire

was embedded in a public class quiz and completed in paper-and-pencil format.

RESULTS

As shown in Figure 2 [Figure 2: see original paper], one-sample t-tests using 5 as the test value revealed that moral ratings were significantly below the median under both moral judgment ($M = 3.35$, $SD = 1.67$, $t(577) = -23.68$, $p < .001$, Cohen' s $d = -0.985$, 95% CI $[-1.78, -1.51]$) and moral action frames ($M = 3.96$, $SD = 1.65$, $t(577) = -15.20$, $p < .001$, Cohen' s $d = -0.632$, 95% CI $[-1.18, -0.91]$), indicating overall deontological decision-making.

A paired-sample t-test showed that moral ratings were significantly higher under the moral action frame than under the moral judgment frame ($t(577) = 10.58$, $p < .001$, Cohen' s $d = 0.62$, 95% CI $[0.49, 0.72]$). Thus, although participants were generally deontological, they became less deontological (more utilitarian) under the moral action frame.

DISCUSSION

Study 1 supported the action-based model of dissonance: participants were less deontological under moral action frames compared to moral judgment frames. When facing moral dilemmas, individuals experience potential moral violations regardless of their decision, inducing dissonance that motivates reduction. Under moral action frames, participants showed greater motivation to reduce dissonance and considered the reasonableness of the proposal more thoroughly, analogous to spreading of alternatives [**?**, **?**]. Consequently, moral action frames reduced deontological propensity relative to judgment frames. Dual-process morality theory cannot explain this reduction, as it would predict increased deontological tendencies given stronger emotional involvement under action frames [**?**, **?**].

However, the traditional paradigm confounds utilitarianism (consequence sensitivity) with deontology (norm sensitivity). The increased acceptance under action frames could reflect either reduced deontological orientation or enhanced utilitarian orientation. This ambiguity arises because traditional dilemmas consider only the proscriptive norm/benefits-greater-than-costs combination, ignoring three other possible combinations. Study 2 therefore used a 2 (norms: prescriptive/proscriptive) $\times$ 2 (consequences: benefits greater/smaller than costs) $\times$ 2 (frame: moral judgment/action) design with CAN algorithm to disentangle these factors and test Study 1' s robustness.

METHOD

STUDY 2

Participants. We recruited 177 university students (59 females; ages 18–23, $M = 20.23$, $SD = 1.13$) who received course credit. Participants provided informed consent. Sample size was determined based on Gawronski et al. [**?**], who

recruited 200 participants to detect a small between-group effect (d = 0.40) with power = 0.80 and = 0.05. Our within-subject design required slightly fewer participants. Results were not examined before terminating data collection. Thirteen participants failed the attitude check and were excluded. Sensitivity analysis (G*Power; [**?**]) indicated that with N = 177, we could detect effect sizes of d = 0.21 using standard criteria (= 0.05 two-tailed, 1- = 0.80, difference between two dependent means).

Design. We used a 2 (norm: prescriptive/proscriptive) × 2 (consequence: benefits greater than/smaller than costs) × 2 (frame: moral judgment/moral action) within-subject design. Each dilemma had four versions (see Appendix 2). Participants answered the same moral judgment and action questions as in Study 1, but using a 10-point scale (0 = "definitely not," 9 = "definitely yes") to prevent median responses. Ratings above 4.5 were coded as utilitarian; ratings below 4.5 as deontological.

Materials and procedure. Three dilemmas were used: one from Gawronski et al. [**?**] and two developed from their scenario structures (see Appendix 2). Each dilemma had four versions, creating 12 scenario sessions. All dilemmas showed significant moral relevance in pre-tests (see Supplemental Materials). Gawronski et al.' s [**?**] attitude-checking scenario was included. Participants read 13 scenario sessions and answered corresponding questions.

Upon arrival, participants received instructions emphasizing careful reading and comprehension: "This is a story reading and comprehension task for filtering materials for the following experiments. Some stories seem very similar but are different in important ways. After reading each scenario, you will be asked several questions about the scenarios. Please carefully read and understand the scenarios, and answer the questions that follow." Participants signed informed consent forms and completed the experiment individually in cubicles.

Dilemma scenarios were presented randomly using Inquisit 3.0. Following each dilemma, moral judgment and action framing questions appeared sequentially. A practice scenario preceded the formal experiment to ensure understanding and was not included in analyses.

RESULTS

Study 1's results were replicated (see Supplemental Materials). Below we present process dissociation and ANOVA with CAN algorithm analyses.

Analysis 1: Process dissociation. Process dissociation uses binary moral judgments, calculating action/inaction probabilities for proscriptive-norm dilemmas with benefits greater than costs (incongruent) or smaller than costs (congruent) [**?**, **?**]. Since we used continuous ratings, we transformed ratings into ratio data by dividing original scores by 9. U and D factor scores were then calculated:

U = p(approval ratio | proscriptive norm, benefits > costs) − p(approval ratio | proscriptive norm, benefits < costs)

D = 1 − [p(approval ratio | proscriptive norm, benefits < costs) / (1 − U)]

Results appear in Figure 3 [Figure 3: see original paper]. A 2 (frame: moral judgment/moral action) × 2 (moral factor: U/D) within-subject ANOVA revealed that moral factor scores were higher under moral action than moral judgment frames ($F(1, 163) = 12.68$, $p < .001$, $p^2 = 0.072$), D factor scores were higher than U factor scores ($F(1, 163) = 1633.68$, $p < .001$, $p^2 = 0.91$), and the frame × factor interaction was significant ($F(1, 163) = 4.56$, $p = .034$, $p^2 = 0.027$). Simple effects showed frame differences were significant for U factor ($F(1, 163) = 10.87$, $p = .001$, $p^2 = 0.063$) but not D factor ($F(1, 163) = 2.15$, $p = .144$, $p^2 = 0.013$). U and D differences were significant under both frames (Fs(1, 163) 1257.07, ps < .001, p^2 0.885).

Process dissociation thus indicated that moral action frames activated more utilitarian propensity than moral judgment frames, but this advantage was not significant for deontological propensity. However, like the traditional paradigm, process dissociation considered only proscriptive norm scenarios, limiting theoretical inference.

Analysis 2: ANOVA and CAN analyses. A 2 (frame: moral judgment/moral action) × 2 (norm: prescriptive/proscriptive) × 2 (consequence: benefits greater than/smaller than costs) within-subject ANOVA (Figure 4 [Figure 4: see original paper]) revealed main effects: moral ratings were higher under moral judgment than action frames ($F(1, 163) = 66.72$, $p < .001$, $p^2 = 0.29$), under prescriptive than proscriptive norms ($F(1, 163) = 680.83$, $p < .001$, $p^2 = 0.81$), and when benefits exceeded costs ($F(1, 163) = 207.92$, $p < .001$, $p^2 = 0.56$).

The frame × norm interaction was significant ($F(1, 163) = 78.38$, $p < .001$, $p^2 = 0.33$). Simple effects showed moral judgment ratings exceeded moral action ratings only under prescriptive norms ($F(1, 163) = 107.92$, $p < .001$, $p^2 = 0.398$), not under proscriptive norms ($F(1, 163) = 0.50$, $p = .48$, $p^2 = 0.003$). Prescriptive norm ratings exceeded proscriptive norm ratings under both frames (Fs(1, 163) 487.09, ps < .001, p^2 0.749).

The frame × consequence interaction was significant ($F(1, 163) = 72.47$, $p < .001$, $p^2 = 0.31$). Simple effects showed moral judgment ratings exceeded moral action ratings only when benefits were smaller than costs ($F(1, 163) = 134.23$, $p < .001$, $p^2 = 0.452$), not when benefits were greater ($F(1, 163) = 0.85$, $p = .357$, $p^2 = 0.005$). Benefits-greater-than-costs ratings exceeded benefits-smaller-than-costs ratings under both frames (Fs(1, 163) 105.55, ps < .001, p^2 0.393).

The norm × consequence interaction was significant ($F(1, 163) = 5.66$, $p = .019$, $p^2 = 0.034$), with simple effects for both norm and consequence significant. Prescriptive norm ratings exceeded proscriptive norm ratings (Fs(1, 163) 482.33, ps < .001, p^2 0.747), and benefits-greater-than-costs ratings exceeded

benefits-smaller-than-costs ratings (Fs(1, 163) 85.23, ps < .001, p^2 0.343).

The triple interaction of frame, norm, and consequence was significant (F(1, 163) = 21.53, p < .001, $p^2 = 0.117$). Simple frame effects were significant (Fs(1, 163) 4.74, ps .031, p^2 0.028). Critically, moral action ratings exceeded moral judgment ratings only in the proscriptive norm/benefits-greater-than-costs condition; in the other three conditions, moral action ratings were lower. Simple effects for norm and consequence remained significant: prescriptive norm ratings exceeded proscriptive norm ratings (Fs(1, 163) 287.49, ps < .001, p^2 0.638), and benefits-greater-than-costs ratings exceeded benefits-smaller-than-costs ratings (Fs(1, 163) 61.11, ps < .001, p^2 0.273).

To identify how moral question frames affected sensitivities and preferences, we transformed original ratings into approval ratios (dividing by 9) and calculated CAN algorithm indexes. Paired t-tests comparing frames showed that moral action frames weakened norm sensitivity (M_action = 0.37, SD = 0.22, 95% CI [0.34, 0.41]; M_judgment = 0.47, SD = 0.22, 95% CI [0.44, 0.51]; t(163) = −8.85, p < .001, Cohen' s d = 0.98, 95% CI of difference [−0.12, −0.08]), strengthened consequence sensitivity (M_action = 0.18, SD = 0.15, 95% CI [0.15, 0.20]; M_judgment = 0.10, SD = 0.12, 95% CI [0.08, 0.12]; t(163) = 8.51, p < .001, Cohen' s d = 0.94, 95% CI of difference [0.06, 0.10]), and shifted from generalized action preference (M_judgment = 0.53, SD = 0.08, 95% CI [0.51, 0.54]) to generalized inaction preference (M_action = 0.48, SD = 0.09, 95% CI [0.47, 0.50]; t(163) = −8.17, p < .001, Cohen' s d = −1.28, 95% CI of difference [−0.06, −0.03]).

DISCUSSION

Study 2 replicated and extended Study 1 through process dissociation and CAN algorithm analyses. Compared to moral judgment frames, moral action frames weakened norm sensitivity, strengthened consequence sensitivity, and transformed preferences from action to inaction.

Simple effect ANOVAs revealed that moral action frames generally reduced acceptance of utilitarian proposals compared to judgment frames, but this effect occurred only under prescriptive norms and when benefits were smaller than costs—not under proscriptive norms or when benefits exceeded costs. This supports the action-based model: proscriptive norms with benefits greater than costs align with both deontological and utilitarian principles, creating minimal cognitive dissonance and no need for alternative spreading. In contrast, prescriptive norms with benefits smaller than costs challenge moral principles, creating dissonance that motivates choice adjustment under action frames.

The divergent results across analysis methods highlight the importance of considering all norm-consequence combinations. Traditional paradigms examined only proscriptive norms with benefits greater than costs, while process dissociation extended to two situations. ANOVA with CAN algorithm covered all

four combinations, revealing that moral action frames affect norm sensitivity, consequence sensitivity, and generalized action/inaction preference.

Using CAN algorithm, we found two novel effects not observed by Gawronski et al. [**?**]: (1) moral-question framing effects on consequence sensitivity, and (2) a significant transformation from action to inaction preference (their Studies 3a and 3b showed unstable action preferences). However, algorithm validity and these new findings require further assessment. Additionally, continuous rating scales may not capture definitive yes/no attitudes. Study 3 therefore used binary responses with the established CNI model to validate CAN algorithm and findings from Study 2, while retesting robustness.

STUDY 3

Method

Participants. Two hundred five university students participated (101 females; aged 17 to 29, M = 19.90, SD = 1.39; one did not report age). Participants provided informed consent and received course credit. Sample size was based on Gawronski et al.' s [**?**] Studies 3a/3b, which recruited 200 participants to detect an effect size of 0.40 with power = 0.80. We recruited additional participants to account for potential exclusions. Results were not examined before terminating data collection. Seven participants failed the attitude check and were excluded. Sensitivity analysis (G*Power; [**?**]) indicated that with N = 205, we could detect effect sizes of d = 0.20 using standard criteria (= 0.05 two-tailed, 1- = 0.80).

Design. Study 3 used the same 2 (norm: proscriptive/prescriptive) × 2 (consequence: benefits greater than/smaller than costs) × 2 (frame: moral judgment/moral action) within-subject design as Study 2, but with binary responses. Participants indicated whether the action was morally acceptable (moral judgment) and whether they would perform it (moral action) using "Yes" / "No" options. C, N, and I parameters were calculated following Gawronski et al. [**?**]. To assess robustness, we also computed moral approval ratios ("yes" frequencies divided by 6 scenarios). Ratios above 0.5 were coded as utilitarian; below 0.5 as deontological.

Materials and procedure. In addition to Study 2' s three dilemmas, we included three more from Gawronski et al. [**?**] (Assisted Suicide, Immune Deficiency, Abduction; see Appendix 2). All six dilemmas and their four versions created 24 scenario sessions. Gawronski et al.' s [**?**] attitude check scenario was included, totaling 25 sessions presented randomly via Inquisit 3.0. Participants answered moral judgment and action questions sequentially after each scenario. Other procedures matched Study 2.

Results

Studies 1 and 2 results were replicated (see Supplemental Materials). Below we present CNI model analyses to validate CAN algorithm and findings.

Using Gawronski et al.' s [**?**] software and model, results appear in Figure 5 [Figure 5: see original paper]. Note that I parameter (CNI) and A parameter (CAN) have inverse scoring: larger I values indicate stronger inaction preference, while larger A values indicate stronger action preference. Norm and consequence sensitivity indexes share the same directional interpretation.

The CNI model showed significant misfit ($G^2(2) = 12.26$, $p = .002$), though the effect size was small (Cohen' s $w = 0.050$), comparable to Gawronski et al.' s [**?**] Study 3b. Bayesian information criteria were negative ($\Delta BIC = -6.05$), suggesting negligible misfit [**?**]. Further analysis revealed that under both frames, participants were significantly sensitive to consequences and norms (parameters > 0). For C parameter: M_judgment = 0.13 (95% CI [0.11, 0.16], $\Delta G^2(1) = 123.38$, $p < .001$, Cohen' s $d = 0.810$); M_action = 0.26 (95% CI [0.23, 0.29], $\Delta G^2(1) = 368.94$, $p < .001$, Cohen's $d = 1.420$). For N parameter: M_judgment = 0.60 (95% CI [0.57, 0.63], $\Delta G^2(1) = 1415.85$, $p < .001$, Cohen' s $d = 2.931$); M_action = 0.45 (95% CI [0.41, 0.48], $\Delta G^2(1) = 578.02$, $p < .001$, Cohen' s $d = 1.792$). For generalized inaction/action preference, participants showed significant action preference under moral judgment frames (M_judgment = 0.34, 95% CI [0.31, 0.38], $\Delta G^2(1) = 81.36$, $p < .001$, Cohen' s $d = -0.667$) and significant inaction preference under moral action frames (M_action = 0.55, 95% CI [0.52, 0.58], $\Delta G^2(1) = 10.30$, $p < .001$, Cohen' s $d = 0.214$).

Paired comparisons between frames showed significant moral-question framing effects for all parameters: C parameter, $\Delta G^2(1) = 49.65$, $p < .001$, Cohen' s $d = -0.714$; N parameter, $\Delta G^2(1) = 44.42$, $p < .001$, Cohen' s $d = 0.682$; I parameter, $\Delta G^2(1) = 77.76$, $p < .001$, Cohen's $d = -0.901$. Compared to moral judgment frames, moral action frames weakened norm sensitivity, strengthened consequence sensitivity, and shifted from action to inaction preference.

Discussion

Study 3 used four analytical approaches to explore the moral-question framing effect. Studies 1 and 2 results were replicated, and CNI model analyses converged with CAN algorithm results. Together, moral action frames caused weaker norm sensitivity, stronger consequence sensitivity, and a shift from action to inaction preference compared to moral judgment frames.

We used four analytical approaches (Table 1). Traditional paradigms and process dissociation did not cover all four norm-consequence combinations, creating theoretical ambiguity. ANOVA with CAN algorithm and CNI model covered all combinations and yielded identical results, demonstrating CAN algorithm' s validity. Future studies should consider using both methods complementarily. Hütter and Klauer [**?**] recommend multinomial tree models for within-subject designs; our within-subject framing design may explain our more robust effects than Gawronski et al.' s [**?**] between-subject design.

Study 3 confirmed and extended Study 2's results in three ways. First, moral action frames increased consequence sensitivity—an effect not found by Gawronski

et al. [?]. This may reflect cultural differences: Chinese participants typically seek a "middle way" when confronting contradictions [?, ?], balancing norms and consequences and thus showing framing effects on both. Westerners may focus more on normative aspects, showing framing effects only for norms. This cross-cultural hypothesis requires future testing.

Second, our norm-sensitivity framing effect was stronger than Gawronski et al.' s [?] marginally significant Study 3a effect ($\Delta G^2(1) = 3.31$, $p = .069$, $d = 0.268$) and significant Study 3b effect ($\Delta G^2(1) = 6.15$, $p = .013$, $d = 0.363$). Our within-subject design provided greater control over individual differences, yielding more robust effects.

Third, our participants showed clear transformation from action to inaction preference under moral action frames—a phenomenon not found by Gawronski et al. [?]. This may also reflect cultural differences in attitudes toward change [?, ?]. From a Chinese dialectical perspective, individuals are more likely to change to maintain balance compared to Westerners, making Chinese participants more responsive to framing.

GENERAL DISCUSSION

Three studies using four analytical approaches demonstrated that moral action frames produce weaker deontological propensity, stronger utilitarian propensity, and a shift from action to inaction preference compared to moral judgment frames. These results, together with Gawronski et al. [?], contradict dual-process morality theory' s prediction that norm sensitivity should be stronger under action frames. Instead, we found the opposite pattern.

Two factors may explain this discrepancy. First, dual-process theory considers only proscriptive norms with benefits greater than costs, whereas Studies 2 and 3 and Gawronski et al.' s [?] work covered all four norm-consequence combinations. Second, dual-process theory focuses on cognitive-emotional competition but not motivational processes. Moral action frames involve stronger acting motivation, prompting individuals to spread their choices. While stronger sacrificial disgust under action frames [?, ?] may reinforce inaction preference, this cannot be dissociated in previous studies. In our studies and Gawronski et al.' s [?], participants generally rejected proposals more under action frames, supporting dual-process theory' s prediction for general action/inaction preferences but not for norm/consequence sensitivity.

Our results support the action-based model of dissonance, which emphasizes cognitive dissonance in decision-making. Individuals show greater alternative-spreading behavior under high dissonance [?, ?, ?, ?]. Harmon-Jones' s research demonstrates that higher approach motivation increases dissonance-reduction behavior and alternative evaluation [?]. In our studies, framing effects disappeared when benefits exceeded costs or when proscriptive norms applied—situations aligning with default moral principles (obey rules, maximize benefits), producing minimal dissonance and no alternative spreading. Framing effects

emerged when benefits were smaller than costs or when prescriptive norms applied—situations creating significant dissonance and motivating choice spreading under action frames.

Contributions

This research extends Gawronski et al. [?] in four ways. First, we provide a motivational perspective on moral decision-making. While dual-process theory explains moral judgment through cognitive-emotional competition, it is less applicable to moral action. Our research, with Gawronski et al. [?], highlights motivational processes: individuals experiencing dissonance with default principles adjust choices when considering action versus judgment. This tendency aligns with the action-based model [?, ?, ?], suggesting individuals pursue norm-consequence balance. Dual-process theory may explain general action/inaction preference discrepancies between frames, while the action-based model explains changes in norm/consequence sensitivity and generalized preferences.

Second, ANOVAs in Studies 2 and 3 revealed that framing effects occurred only when benefits were smaller than costs and when prescriptive norms applied, not when benefits exceeded costs or proscriptive norms applied. To our knowledge, this boundary condition has not been previously identified and further supports the action-based model. When situations align with default principles, dissonance is minimal and framing effects absent; when they challenge principles, dissonance motivates choice spreading.

Third, differences between our findings and Gawronski et al.' s [?] provide new evidence for cross-cultural variation in moral decision-making. Chinese participants showed framing effects on consequence sensitivity, norm sensitivity, and generalized inaction/action preferences, whereas Western participants showed effects only on norm sensitivity. This may reflect dialectical thinking [?, ?] and attitudes toward change [?, ?]: Chinese seek "middle ways" and balance, while Westerners focus more on normative aspects. Chinese participants also showed clearer transformation from action to inaction preference.

Fourth, we comprehensively applied four analytical approaches. ANOVA with CAN algorithm, which calculates norm/consequence indexes and generalized action/inaction preference, complements existing methodologies [?]. It covers all four norm-consequence combinations and permits correlation/regression analysis, advantages over CNI' s group-level estimation. Hütter and Klauer [?] recommend multinomial tree models for within-subject designs, which we employed for framing questions, potentially explaining our more robust effects than Gawronski et al.' s [?] between-subject design. Other studies with similar structures (e.g., examining how harming intention and consequence affect moral blame) could adopt our 2×2 design.

Possible Critiques

Three limitations merit consideration. First, critics may argue for more ecologically valid scenarios. We emphasize that relevance to participants' morality is paramount. Our pilot studies ensured scenario relevance, and we developed "air pollution" and "jump the queue" dilemmas based on everyday experience while using established life-or-death scenarios. Results were stable across these variations.

Second, a fixed random order for scenario presentation might reduce random error. In Study 3, CNI model misfit (though negligible) may have resulted from random presentation order creating variability across participants. While we recommend fixed random order as in Gawronski et al. [**?**], our stable, replicated results suggest presentation order effects were minimal.

Finally, critics may attribute framing effects to sequential question answering (judgment first, action second) rather than intrinsic motivation. However, sequential order cannot fully explain our results. In Studies 2 and 3, framing effects appeared only when situations contradicted moral principles (prescriptive norms, benefits smaller than costs), not when they aligned (proscriptive norms, benefits greater than costs). If participants merely adjusted second answers arbitrarily, patterns would be consistent across scenarios. The differential patterns across norm-consequence combinations indicate that adjustments were principle-dependent, not random. Future studies could use fixed random question order for further verification.

CONCLUSION

Three studies using four analytical approaches demonstrated that moral action frames activate weaker deontological propensity, stronger utilitarian propensity, and shift preferences from action to inaction compared to moral judgment frames. These results support the action-based model of cognitive dissonance and advance moral theory by incorporating motivational processes into moral decision-making.

Appendix 1: The Scenarios Used in Study 1

Scenario 1: Crying Baby; Mean emotion rating: 6.8; High-conflict Enemy soldiers have taken over your village. They have orders to kill all remaining civilians. You and some of your townspeople have sought refuge in the cellar of a large house. Outside you hear the voices of soldiers who have come to search the house for valuables. Your baby begins to cry loudly. You cover his mouth to block the sound. If you remove your hand from his mouth his crying will summon the attention of the soldiers who will kill you, your child, and the others hiding out in the cellar. To save yourself and the others you must smother your child to death. Would you smother your child in order to save yourself and the other townspeople?

Scenario 2: Ecologists; Mean emotion rating: 6.1; High-conflict You are part of a group of ecologists who live in a remote stretch of jungle. The entire group, which includes eight children, has been taken hostage by a group of paramilitary terrorists. One of the terrorists takes a liking to you. He informs you that his leader intends to kill you and the rest of the hostages the following morning. He is willing to help you and the children escape, but as an act of good faith he wants you to kill one of your fellow hostages whom he does not like. If you refuse his offer all the hostages including the children and yourself will die. If you accept his offer then the others will die in the morning but you and the eight children will escape. Would you kill one of your fellow hostages in order to escape from the terrorists and save the lives of the eight children?

Scenario 3: Sacrifice; Mean emotion rating: 6.7; High-conflict You, your husband, and your four children are crossing a mountain range on your return journey to your homeland. You have inadvertently set up camp on a local clan' s sacred burial ground. The leader of the clan says that according to the local laws, you and your family must be put to death. However, he will let you, your husband, and your three other children live if you will kill your oldest son. Would you kill your oldest son in order to save your husband and your other three children?

Scenario 4: Footbridge; Mean emotion rating: 6.0; High-conflict A runaway trolley is heading down the tracks toward five workmen who will be killed if the trolley proceeds on its present course. You are on a footbridge over the tracks, in between the approaching trolley and the five workmen. Next to you on this footbridge is a stranger who happens to be very large. The only way to save the lives of the five workmen is to push this stranger off the bridge and onto the tracks below where his large body will stop the trolley. The stranger will die if you do this, but the five workmen will be saved. Would you push the stranger onto the tracks in order to save the five workmen?

Scenario 5: Sophie' s Choice; Mean emotion rating: 6.6; High-conflict It is wartime and you and your two children, ages eight and five, are living in a territory that has been occupied by the enemy. At the enemy' s headquarters is a doctor who performs painful experiments on humans that inevitably lead to death. He intends to perform experiments on one of your children, but he will allow you to choose which of your children will be experimented upon. You have twenty-four hours to bring one of your children to his laboratory. If you refuse to bring one of your children to his laboratory, he will find them both and experiment on both of them. Would you bring one of your children to the laboratory in order to avoid having them both die?

Scenario 6: Vitamins; Mean emotion rating: 5.8; High-conflict You are the leader of a mountaineering expedition that is stranded in the wilderness. Your expedition includes a family of six that has a genetically caused vitamin deficiency. A few people' s kidneys contain large amounts of this vitamin. There is one such person in your party. The only way to save the lives of the six members of this family is to remove one of this man' s kidneys so that the

necessary vitamins may be extracted from it. The man will not die if you do this, but his health will be compromised. The man is opposed to this plan, but you have the power to do as you see fit. Would you forcibly remove this man' s kidney in order to save the lives of the six vitamin-deficient people?

Appendix 2: Dilemma Scenarios Used in Studies 2 And 3

The first two dilemmas are self-compiled and the latter four are selected from Gawronski et al. (2017). The first three dilemmas were used in Study 2 and all six were used in Study 3.

Dilemmas	Proscriptive norm prohibits action	Prescriptive norm prescribes action
Pollution	Benefits of action greater than costs: You are the director of the village enterprise management committee. One village enterprise is located between villages A and B. The exhaust gases blow toward village B. If no purification equipment is installed, the air quality will be affected, causing one additional cold each year for the villagers in village B, while each villager in village A will get an extra 50,000 enterprise bonus every year, rapidly addressing the issue of poverty. Is it acceptable in this case not to install purification equipment?	Benefits of action greater than costs: You are the director of the village enterprise management committee. One village enterprise is located between villages A and B. The exhaust gases blow toward village B. If purification equipment is installed, the air quality will be affected, causing one less cold each year for the villagers in village B, while each villager in village A will get 50,000 less of an enterprise bonus every year and continue to struggle in poverty. Is it acceptable in this case to install purification equipment?

Dilemmas	Proscriptive norm prohibits action	Prescriptive norm prescribes action
	Benefits of action smaller than costs: You are the director of the village enterprise management committee. One village enterprise is located between villages A and B. The exhaust gases blow toward village B. If no purification equipment is installed, the air quality will be affected, causing an average lifespan decrease of 5 years for villagers in village B, while each villager in village A will get an extra 1,000 enterprise bonus every year and an improved quality of life. Is it acceptable in this case not to install purification equipment?	Benefits of action smaller than costs: You are the director of the village enterprise management committee. One village enterprise is located between villages A and B. The exhaust gases blow toward village B. If purification equipment is installed, the air quality will not be affected, causing an average lifespan increase of 5 years for villagers in village B, while each villager in village A will get 1,000 less of an enterprise bonus every year and a small reduction in quality of life. Is it acceptable in this case to install purification equipment?
Jump the Queue	Benefits of action greater than costs: You are an ordinary passenger. In the ticket hall of the railway station, a person needs to buy tickets for a train that is about to depart. If you help him to jump the queue and buy the tickets for the only train on the same day, he himself can successfully travel, but it will affect the travel of another five people who wish to buy tickets for the only train on the same day. Is it acceptable in this case to help him jump the queue?	Benefits of action greater than costs: You are an ordinary passenger. In the ticket hall of the railway station, a person is jumping the queue to buy a ticket for a train that is about to depart. If you stop him from jumping the queue, he cannot travel successfully, but it will guarantee that another five people can buy tickets for the only train on the same day. Is it acceptable in this case to stop him from jumping the queue?

Dilemmas	Proscriptive norm prohibits action	Prescriptive norm prescribes action
	Benefits of action smaller than costs: You are an ordinary passenger. In the ticket hall of the railway station, a person needs to buy a ticket for a train that is about to depart. If you help him to jump the queue, he himself can successfully travel, but it will affect the travel of one other person. Is it acceptable in this case to help him jump the queue?	Benefits of action smaller than costs: You are an ordinary passenger. In the ticket hall of the railway station, a person needs to buy a ticket for a train that is about to depart. If you stop him from jumping the queue, he cannot successfully travel, and the disturbance caused by your behavior will affect the travel of another five people. Is it acceptable in this case to stop him from jumping the queue?
Transplant	Benefits of action greater than costs: You are a surgeon in a small hospital. One day, your hospital receives five badly hurt patients from a car accident. The patients all need organ transplants or they will die. You have no spare organs, but there is a patient who has been in a coma for several weeks and it seems unlikely that he will wake up again. You could terminate his life support and take his organs for the five accident victims, so that their lives will be saved. Is it acceptable in this case to terminate the patient' s life support to take his organs?	Benefits of action greater than costs: You are a surgeon in a small hospital. One day, your hospital receives five badly hurt patients from a car accident. The patients all need organ transplants or they will have serious health problems for the rest of their lives. You have no spare organs, but there is a patient who has been in a coma for several weeks and it seems unlikely that he will wake up again. One of your co-workers plans to terminate his life support and take his organs for the five accident victims, so that they won' t suffer from health problems. You could stop your co-worker by informing the director of the hospital. Is it acceptable in this case to stop your co-worker from terminating the patient' s life support to take his organs?

Dilemmas	Proscriptive norm prohibits action	Prescriptive norm prescribes action
	Benefits of action smaller than costs: You are a surgeon in a small hospital. One day, your hospital receives five badly hurt patients from a car accident. The patients all need organ transplants or they will have serious health problems for the rest of their lives. You have no spare organs, but there is a patient who has been in a coma for several weeks and it seems unlikely that he will wake up again. You could terminate his life support and take his organs for the five accident victims, so that they won' t suffer from health problems. Is it acceptable in this case to terminate the patient' s life support to take his organs?	Benefits of action smaller than costs: You are a surgeon in a small hospital. One day, your hospital receives five badly hurt patients from a car accident. The patients all need organ transplants or they will die. You have no spare organs, but there is a patient who has been in a coma for several weeks and it seems unlikely that he will wake up again. One of your co-workers plans to terminate his life support and take his organs for the five accident victims, so that their lives will be saved. You could stop your co-worker by informing the director of the hospital. Is it acceptable in this case to stop your co-worker from terminating the patient' s life support to take his organs?
Assisted Suicide	Benefits of action greater than costs: You are a doctor and are treating a seriously ill, suffering patient. Even the strongest drugs do not relieve him from his pain anymore. He feels terrible agony and you know that his condition will never improve. For days, he has been waiting for his death. Since he no longer wants to endure his pain, he repeatedly asks you to end his life. You could give him a drug causing his death, which will release him from his pain. Is it acceptable in this case to provide your patient with this drug?	Benefits of action greater than costs: You are a doctor and are treating a seriously ill, suffering patient. Even the strongest drugs do not relieve him from his pain anymore. He feels terrible agony, but you know that he will get better again soon. For days, he has been waiting to see improvements. Since he no longer wants to endure his pain, he repeatedly asks you to end his life. Suddenly, he has a severe heart attack. You could give him a drug to save him from dying. Is it acceptable in this case to provide your patient with this drug?

Dilemmas	Proscriptive norm prohibits action	Prescriptive norm prescribes action
	Benefits of action smaller than costs: You are a doctor and are treating a seriously ill, suffering patient. Even the strongest drugs do not relieve him from his pain anymore. He feels terrible agony, but you know that he will get better again soon. For days, he has been waiting to see improvements. Since he no longer wants to endure his pain, he repeatedly asks you to end his life. You could give him a drug causing his death, which will release him from his pain. Is it acceptable in this case to provide your patient with this drug?	Benefits of action smaller than costs: You are a doctor and are treating a seriously ill, suffering patient. Even the strongest drugs do not relieve him from his pain anymore. He feels terrible agony and you know that his condition will never improve. For days, he has been waiting for his death. Since he no longer wants to endure his pain, he repeatedly asks you to end his life. Suddenly, he has a severe heart attack. You could give him a drug to save him from dying. Is it acceptable in this case to provide your patient with this drug?
Immune Deficiency	Benefits of action greater than costs: You are the director of a hospital in a developing country. A foreign student who is volunteering in the country got infected with a rare virus. The virus is highly contagious and deadly to seniors and children. The only medication that can effectively stop the virus from spreading has severe side-effects. Although the virus will not kill her, the student suffers from a chronic immune deficiency that will make her die from these side-effects. However, taking her out of quarantine to return her to her home country for special treatment involves a considerable risk that the virus will spread. Is it acceptable in this case to give the student the medication?	Benefits of action greater than costs: You are the director of a hospital in a developing country. A foreign student who is volunteering in the country got infected with a rare virus. The virus is highly contagious and can cause severe stomach cramps. The only medication that can effectively stop the virus from spreading has severe side-effects. The virus will not kill her, but taking her out of quarantine to return her to her home country for treatment involves a considerable risk that the virus will spread. Is it acceptable in this case to take the student out of quarantine to return her to her home country for treatment?

Dilemmas	Proscriptive norm prohibits action	Prescriptive norm prescribes action
	Benefits of action smaller than costs: You are the director of a hospital in a developing country. A foreign student who is volunteering in the country got infected with a rare virus. The virus is highly contagious and can cause severe stomach cramps. The only medication that can effectively stop the virus from spreading has severe side-effects. The student suffers from a chronic immune deficiency that will make her die from the virus if she is not returned to her home country for special treatment. However, taking her out of quarantine involves a considerable risk that the virus will spread. Is it acceptable in this case to give the student the medication?	Benefits of action smaller than costs: You are the director of a hospital in a developing country. A foreign student who is volunteering in the country got infected with a rare virus. The virus is highly contagious and deadly to seniors and children. The only medication that can effectively stop the virus from spreading has severe side-effects. The student suffers from a chronic immune deficiency that will make her die from the virus if she is not returned to her home country for special treatment. However, taking her out of quarantine involves a considerable risk that the virus will spread. Is it acceptable in this case to take the student out of quarantine to return her to her home country for treatment?
Abduction	Benefits of action greater than costs: You are the president of your country. A guerilla group operating in a conflict zone has abducted a journalist from your country and threatens to behead him if your government does not pay a ransom of one million dollars. The group will use the ransom money to buy weapons for their guerilla war, which will cause the deaths of many people. Congress has approved payment of the ransom, but you have the power to veto the payment. Is it acceptable in this case to approve the ransom payment?	Benefits of action greater than costs: You are the president of your country. A guerilla group operating in a conflict zone has abducted a journalist from your country and threatens to behead him if your government does not pay a ransom of one million dollars. The group will use the ransom money to buy food for their families, who live in an area that has been plagued by several draughts. As the president, you have the power to approve payment of the ransom. Is it acceptable in this case to veto the ransom payment?

Dilemmas	Proscriptive norm prohibits action	Prescriptive norm prescribes action
	Benefits of action smaller than costs: You are the president of your country. A guerilla group operating in a conflict zone has abducted a journalist from your country and threatens to behead him if your government does not pay a ransom of one million dollars. The group will use the ransom money to buy food for their families, who live in an area that has been plagued by several draughts. Congress has approved payment of the ransom, but you have the power to veto the payment. Is it acceptable in this case to approve the ransom payment?	Benefits of action smaller than costs: You are the president of your country. A guerilla group operating in a conflict zone has abducted a journalist from your country and threatens to behead him if your government does not pay a ransom of one million dollars. The group will use the ransom money to buy weapons for their guerilla war, which will cause the deaths of many people. As the president, you have the power to approve payment of the ransom. Is it acceptable in this case to veto the ransom payment?

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TABLES, TABLE CAPTIONS

TABLE 1. Four main analysis methods in moral decision-making and the respective scenario types involved.

Methodology	Proscriptive Norm	Prescriptive Norm
	Benefits greater than costs	Benefits smaller than costs
Traditional	+	
Process dissociation	+	+
ANOVA with CAN algorithm	+	+

Note: + means that type of scenario was considered.

FIGURES, FIGURE CAPTIONS

FIG. 1. CNI model of moral decision-making predicting action versus inaction responses in moral dilemmas with proscriptive and prescriptive norms and consequences involving benefits of action that are either greater or smaller than costs of action (Gawronski et al., 2017).

p(inaction | proscriptive norm, benefits > costs) = [(1−C) × N] + [(1−C) × (1−N) × I]

p(inaction | proscriptive norm, benefits < costs) = C + [(1−C) × N] + [(1−C) × (1−N) × I]

p(inaction | prescriptive norm, benefits > costs) = (1−C) × (1−N) × I

p(inaction | prescriptive norm, benefits < costs) = C + [(1−C) × (1−N) × I]

p(action | proscriptive norm, benefits > costs) = C + [(1−C) × (1−N) × (1−I)]

p(action | proscriptive norm, benefits < costs) = (1−C) × (1−N) × (1−I)

p(action | prescriptive norm, benefits > costs) = C + [(1−C) × N] + [(1−C) × (1−N) × (1−I)]

p(action | prescriptive norm, benefits < costs) = [(1−C) × N] + [(1−C) × (1−N) × (1−I)]

FIG. 2. Moral ratings under the moral judgment and moral action frames in Study 1.

Note: Error bars represent standard errors. *** $p < .001$

FIG. 3. U and D factor scores under the moral judgment and moral action frames in Study 2. Only the scenarios of proscriptive norms were considered.

Note: Error bars represent standard errors. *** $p < .001$

FIG. 4. Moral ratings in the four combined situations of norm (proscriptive/prescriptive) and consequence (benefits greater/smaller than costs) under the moral judgment and moral action frames in Study 2.

Note: Error bars represent standard errors.

FIG. 5. Parameter estimates of sensitivity to consequences (C), sensitivity to norms (N), and general preference for inaction versus action (I) as a function of question framing (moral judgment vs. moral action) in Study 3.

Note: Error bars represent standard errors.

Note: Figure translations are in progress. See original paper for figures.