

## **Forty-eight classical moral dilemmas in Persian language: A validation and cultural adaptation study**

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## **ABSTRACT**

Moral dilemmas are a useful tool to investigate empirically, which parameters of a given situation modulate participants' moral judgment, and in what way.

In an effort to provide moral judgment data from a non-WEIRD culture, we provide the translation and validation of 48 classical moral dilemmas in Persian language. The translated dilemma set was submitted to a validation experiment with N=82 Iranian participants. Data from Iranian participants confirmed the four-factor structure of this dilemma set including *Personal Force* (Personal, Impersonal), *Benefit Recipient* (Self, Other), *Evitability* (Avoidable, Inevitable), and *Intentionality* (Accidental, Instrumental). When comparing moral judgments of Iranian participants to those of Spanish and Italian participants' from previous research with the same dilemma set, differences emerged. Iranian participants' moral judgments were more deontological (i.e., they refrained from harm), than Spanish and Italian participants. Religiosity made participants' moral judgments more deontological, and also dysphoric mood resulted in a more deontological response style.

**Keywords:** Moral judgment; moral dilemmas; deontology; utilitarianism; trade-off, Iran; Persia

## **Forty-eight classical moral dilemmas in Persian language: A validation and cultural adaptation study**

*“Head not the Sunna, nor the law divine;  
If to the poor his portion you assign,  
And never injure one, nor yet abuse,  
I guarantee you heaven, and now some wine!”*

Omar Khayyam (1048-1131)

Persian polymath, mathematician, astronomer, philosopher, and poet

### **1. Introduction**

On a basic physiological level, we human beings, just like all other animals, are concerned with maximizing pleasure and avoiding pain. Basic neural circuitries in our brain process events that cause pleasure and displeasure and, in so doing, guide our behavior and the choices that we make. They make us strive towards some stimuli, and shy away from others. These basic circuitries ensure survival in the wild.

However, for human beings, the process doesn't stop here. Throughout evolution, folds of sociality were added to the neutral architecture of our brain, enabling life in ever more complex groups and, eventually, in large-scale societies. The “social brain” is an enigmatic layer of the human brain that harbors our ability to feel prosocial emotions like empathy, empathic concern, shame, guilt, and embarrassment. Thus, more than “just” striving to minimize instant pain and maximize immediate pleasure, our human brain has a more complex equation to solve, as we navigate our social world. Superimposed to the basic “approach and avoidance” tendencies of our brain is a complex web of conditions that make the decision to approach or avoid riddled with “ifs”.

In experimental psychology and cognitive neuroscience, these “ifs” are being referred to as moral intuitions or foundations of human cognition. These guide our behavior. For example, our ability to feel empathy for the pain of another human being may propel us to help a person in need, *even if* this may be contrary to our brain's primary motive of avoiding pain and maximizing pleasure for ourselves. Yet again, research shows that our proneness to help a person in need may depend on whether the person to be saved is our next-of-kin, or a stranger. Finally, an additional layer of conditions governs our behavior. These are the rules, conventions, and enculturation processes that societies set up and agree to live by to enable peaceful life in societies. Some of these rules are set out in complex legal systems, others are merely enforced through the social network and the social gaze.

The Moral Foundations' Theory of Human Morality by Haidt and Joseph (Haidt & Joseph, 2004, 2008), proposes that there are five (or six) universal foundational pillars in our human cognition that determine our behavior, often over and above any learned social principles or rules regarding what's right and what's wrong. These foundations are Care/harm (i.e., act to care for others, and strive to eliminate pain and suffering), Fairness/cheating (i.e., the proportionality of giving and receiving, known as reciprocity, and an aversion of inequity), Loyalty/betrayal (i.e., a tendency to feel fidelity to one's in-group), Authority/subversion (i.e., a tendency to understand and abide by hierarchies), and Sanctity/degradation (i.e., a tendency to glorify and elevate to “sanctity” certain individuals, deeds, or values, as well as tending to condemn violations of the so-declared

sacred individuals, deeds and values; aversion of out-group individuals and rigorous enforcing of sexual norms) (Haidt, 2012), and Liberty/ oppression (i.e. moral judgments on political equality, notably rage against bullies and dominators who oppress others) as a potential sixth foundation (Graham et al., 2013).

At a basic cognitive level, it has been proposed that there may be biological determinants in the human cognitive structure that make us override socially enforced criteria. For a given situation, socially enforced criteria for right and wrong and these cognitive foundations may be aligned, while conflict arises when they are not. Moral judgment is one aspect of human moral cognition (Greene, 2015), and the moral judgments that people make can be used to understand which situations trigger such conflicts.

Moral judgment, in experimental psychology, is defined as the judgment that we formulate about a given hypothetical situation (Christensen & Gomila, 2012). As such, moral judgment to hypothetical moral dilemmas has become one important behavioral method to investigate human moral cognition empirically. Moral judgment can be used to probe for moral foundations (Haidt & Joseph, 2004, 2008) (e.g., see Christensen et al., 2014; Greene et al., 2001; Reynolds & Conway, 2018), as well as for how these foundations may be modulated by socialization processes. For example, by comparing moral judgment to moral dilemmas across cultures (where supposedly different socialization processes are at play) (Rhim, Lee, & Lee, 2020). For explanation of the alternative paradigms in moral cognition research, please refer to the supplementary material, section 1.2.

Moral dilemmas are hypothetical scenarios describing two potential outcomes for a situation, both of which involve harm to another person or groups of people and, therefore, commonly trigger conflicting moral foundations, e.g., to protect others from harm. Participants are invited to make a “moral judgment”, which, in the case of moral dilemmas, is the behavioral choice between keys on the keyboard, where one “judgment” leads to the outcome of one person or groups of people being harmed, and the other to a different person or group being harmed. By asking participants to make a forced choice between these two conflicting outcomes, it is possible to examine parameters within the moral dilemmas that may determine which outcome option participants choose. In these classical “thought experiments” (Christensen & Gomila, 2012; Foot, 1967; Thomson, 1976), especially four parameters have been studied empirically. These four include the effects on participants’ moral judgment of: “Personal Force” (whether the physical proximity of one’s own body to the produced harm is up close and personal, or distant and impersonal), “Benefit Recipient” (who the people on each side of the trade-off saved/sacrificed are; children, adults, individuals related to the protagonist, or not), “Evitability” (whether or not the people sacrificed would have been harmed either way, inevitably, regardless of the protagonist’s action), and “Intentionality” (whether or not the protagonist is using the harm to the sacrificed as a means to save the others, or whether the harm happens as a non-desired side-effect) (Christensen & Gomila, 2012). For examples that explain the four different factors, please refer to the supplementary material, section 1.1.

The concepts probed for in the classical moral dilemmas are known in Moral and Legal Theory, coined by Thomas Aquinas, as the Doctrine of Doing and Allowing (DDA) (Quinn, 1989). This doctrine argues that it is more difficult to explain harm resulting from the action than from inaction, as in the instance of active vs. passive harm (Personal Force),

because such a distinction creates a moral difference. Thus, in moral dilemmas, people are more susceptible to the consequences of action than to the consequences of inaction (Christensen & Gomila, 2012); this phenomenon is also known as omission bias (Ritov & Baron, 1990).

Accordingly, by very carefully controlling the variables presented in the dilemmas of a dilemma set, it is possible to add or subtract elements and study how these modulate participants' moral judgment (Christensen & Gomila, 2012), allowing for a systematic empirical assessment of human moral judgments (Hauser, Cushman, Young, Kang-Xing Jin, & Mikhail, 2007).

In addition, moral dilemmas can be formulated to probe for individuals' tendency for utilitarian vs. deontological moral judgments (Greene et al., 2001). The moral theory of utilitarianism (Bentham, 2015; Mill, 1871) implies that the right decision is the one that achieves the best overall impact; hence, the results are measured independently of the acts that contribute to them and what sacrifices they involve (i.e., valuing the end over the means). For example, in the trolley dilemma, the utilitarian moral judgment would be to take action by flipping the control switch to save the five workmen and let the trolley run over one person on the other track. The moral theory of deontology, on the other hand, is an ethical stance that is normative (Kant & Hartenstein, 1867), and it indicates that the morality of an action is valued per the observance of moral laws, privileges, responsibilities, or obligations that individuals must fulfill, irrespective of the possible consequences (i.e., valuing the means over the ends). Thus, a deontological moral judgment would be to take no action, as flipping the control switch would kill the person on the other track in the trolley dilemma.

One criticism of using moral dilemmas is that the events described in the classical moral dilemmas are highly unrealistic, at least, for first-world research participants. However, reality tells a different tale. Even serious moral problems may become part of the regular lives of all people (Christensen & Gomila, 2012), and are a part of everyday news in our globalized world. Besides, how realistic a dilemmatic situation is, given a particular group of participants, is a separate research question in itself. Comparing moral judgment of military service or medical personnel to that of non-military or medical personnel can be one way to assess how real life-experience with dilemmatic situations impacts moral judgment to hypothetical moral dilemmas (Graaff, Schut, Verweij, Vermetten, & Giebels, 2015; Pence, 2004). Another way to assess this is to compare research participants from countries in a state of emergency or war (e.g., the Islamic Republic of Iran), with participants from countries that have had decades of peace, and where the young generations have not known real crises and war (e.g., Europe).

In addition, to investigate subtle determinants of our moral judgment to hypothetical moral dilemmas, it has been proposed in Christensen et al. (2014) to use a Likert scale format when participants make their judgments in the lab. It has been suggested that moral judgment is a matter of degree, more than a question in absolute terms. Using a graded response scale allows assessing the impact of subtle variations in the dilemma formulation on our moral cognition (Christensen et al., 2014).

Given that previous research in this domain has mostly been focused on Western cultures, validating moral dilemmas in diverse populations with less westernized values would promote our understanding of universals and culture-dependent differences in moral judgment. Research has shown that, on average, people in Western, Educated,

Industrialized, Rich, and Democratic (WEIRD) populations are more individualistic and more analytical (see e.g., Kanagawa, Cross, & Markus, 2001; Kitayama, Park, Sevincer, Karasawa, & Uskul, 2009). Westerners also appear to be more impersonally prosocial (i.e., helping strangers that they are not specifically related to in kinship or friendship), while generally exhibiting less conformity, less discipline, less solidarity, and less nepotism (Kanagawa et al., 2001; Kitayama et al., 2009). In a study by Chan et al. (2016) with a Chinese version of the dilemma set found in the Footbridge (personal) dilemma presented in a foreign language, participants made more utilitarian decisions than in their native language (Chan, Gu, Ng, & Tse, 2016).

One set of 40 moral dilemmas (18 impersonal and 22 personal) was developed by Greene et al. (2004) in the US (Greene et al., 2004). Moore et al. (2008) created more dilemmas based on Greene et al. (2004) and increased the number of dilemmas in the set to 24 pairs (48 dilemmas) (Moore, Clark, & Kane, 2008). This set was later translated and validated in several languages. Christensen et al. (2014) translated, fine-tuned, and validated 46 of these dilemmas in Spanish, and also provided further translations of the same for further research (French, Catalan, German, and Danish) (Christensen et al., 2014). Cecchetto et al. (2017) further translated and validated the dilemmas in Italian (Cecchetto, Rumiati, & Parma, 2017).

Despite the widespread use of moral dilemmas in moral judgment research, however, there is, to our knowledge, no research in this domain with Middle Eastern cultures. Therefore, the primary aim of the present project was the translation, cultural adaptation, and empirical validation of the set of 48 moral dilemmas by Christensen et al. (2014) in the Persian language (i.e., Farsi; we use the label “Persian” here). For this, we used methods designed to optimize normative equivalence between the multiple subunits; which is a five stages procedure (i.e., translation, synthesis, back translation, expert committee review, pretesting) for cross-cultural adaptation of self-report measures (Beaton, Bombardier, Guillemin, & Ferraz, 2000). The cultural adaptation consisted in making all dilemmas genderless except for dilemmas number 3, 4, 10, 26, 29, 30, 39, 40, 43, and 44 which was genderless in the original version. We did this adaptation because in the Persian language all pronouns are genderless. The specific examples of adaptations can be found in the supplementary material, section 1.3.

In addition to translating and validating the dilemma set in Persian, to explore to what extent moral judgment is modulated by culture (Graham et al., 2013), we compared the data obtained in our experiment with an Iranian sample to the data of previously published experiments that assessed moral judgment in Italian (Cecchetto et al., 2017) and Spanish samples (Christensen et al., 2014); two WEIRD populations (Henrich, 2021).

We based our hypotheses on the assumptions of the moral foundation's theory (Haidt, 2012), Western populations are different from the non-WEIRD population. In WEIRD societies, the moral domain is exceptionally small, essentially limited to the ethics of individuals (i.e., moral concerns focus on condemning actions by individuals that harm, oppressor cheat on other individuals, independently of any community or divinity-based norms). It is broader in most other cultures, that often incorporate ethics of community and divinity (i.e., moral concerns take into account relations of kinship, favors, and religious prescriptions when condemning actions by individuals) (Haidt, 2012; Henrich, Heine, & Norenzayan, 2010). Therefore, we hypothesized that participants in the Iranian sample would tend to judge moral dilemmas with a more deontological pattern than Italian

or Spanish samples, similar to what has been found in a sample of religious Spanish participants (Christensen et al., 2012). Besides, one other important reason why we predicted a more deontological response pattern in the Iranian sample was that the Iranian population has lived in a constant situation of crisis and sometimes war for the past 40 years. In accordance with Blanchard et al.'s theory (1995), real-life experience of hardship may make moral judgment more deontological (i.e., "if you've experienced a dilemmatic situation and felt the actions of your own body, you may shy away from performing such actions again, and therefore, choose a more deontological moral judgment") (Blanchard et al., 1995).

In addition, due to the fact that previous research has reported mixed results regarding gender differences in moral judgments (Friesdorf, Conway, & Gawronski, 2015), we examined gender differences in this experiment as a secondary aim. For example, research from the 1980s suggests that in real-life dilemmas, women pay more attention to the aspects of care and upbringing—they are more deontological—and men are more inclined to do justice—they are more utilitarian—in moral reasoning (Gilligan & Attanucci, 1988) (e.g., Eagly & Crowley, 1986; Eisenberg, Fabes, & Shea, 1989; Lennon & Eisenberg, 1987). Yet, the effect sizes for these results were small (e.g., care reasoning effect size = -1.04; justice reasoning effect size = 1.04; for a meta-analysis see Jaffee & Hyde, 2000). However, when it comes to moral judgments to hypothetical moral dilemmas in the laboratory setting, results have been mixed concerning the relationship between gender and moral judgment (e.g., for a relatively ignorable contribution of the gender role in participants moral judgment see Banerjee, Huebner, & Hauser, 2010; Gleichgerricht & Young, 2013; Hauser et al., 2007, for a partially positive relation between gender and moral judgment see: Friesdorf, Conway, & Gawronski, 2015; Fumagalli et al., 2010; Rueckert & Naybar, 2008; Youssef et al., 2012). Some research shows that men show more utilitarian response tendencies to hypothetical, harm-based moral dilemmas, as compared to women. Conversely, women adopt a more deontological response tendency than men in personal but not impersonal harm propositions in moral dilemmas (Capraro & Sippel, 2017; Mikhail, 2002; Petrinovich & O'Neill, 1996). Although gender effects on moral judgment have been mixed, we explored the role of gender also in our study.

An additional aim was to examine the contribution of interindividual difference variables including religiosity (Isler, Yilmaz, & John Maule, 2021; for a meta-analysis, see Saroglou & Craninx, 2021), and mood (Gawronski, Conway, Armstrong, Friesdorf, & Hütter, 2018; Haidt, 2003) on moral judgment. Based on previous literature, we predicted that a higher level of religiosity leads to a more deontological and higher level of mood (i.e., happy) would lead to more utilitarian moral judgments. One meta-analysis of 27 studies showed consistent findings across studies, methods, and countries using 'trolley dilemma', that religiosity of research participants was associated with more deontological choices (Christensen, Flexas, Miguel, Cela-Conde, & Munar, 2012; Saroglou & Craninx, 2021). Besides, Gawronski et al.'s (2018) study has been shown incidental happiness decrease sensibility to moral norms, but it doesn't change the sensibility to consequences of a moral dilemma (i.e., more utilitarian judgment) (Gawronski, Conway, Armstrong, Friesdorf, & Hütter, 2018).

Finally, Greene et al., (2001, 2004) and Christensen et al., (2012, 2014) assessed how different moral dilemma factors and response tendencies (utilitarian, deontological) affect participants' reaction times (Kroneisen & Steghaus, 2021). It has been found that a longer

reaction time (RT) is correlated with deontological responses; thus, we expect that deontological moral judgments would take a longer time for participants to make.



## 2. Method

The study was approved by the Institute for Cognitive Sciences Studies, Tehran, Iran (ICSS) ethics committee (Institutional review board (IRB) approval ID: 1497864).

### 2.1. Participants

Eighty-two university students (53 female) aged between 19-44 years ( $M=23.2$ ,  $SD=4.72$ ) participated in this study in exchange for course credit. Inclusion criteria were age older than 18 years, having Iranian nationality, and being native Persian speakers. All the participants had normal or corrected eyesight. One male participant has excluded because he did not complete the process. Participants' characteristics are set out in **Table 1**.

**Table 1**  
*Participant characteristics*

Variable	Females	Males
N	53	28
Age (SD)	23.02 (5.04)	23.79 (4.17)
Completed military service	0 %*	7.14%
Educational level		
High School	22.64 %	21.42 %
Bachelor	54.72 %	42.85 %
Master's	20.75 %	28.57 %
Ph.D.	1.89 %	7.14 %
The Duke University Religion Index		
subscale 1 (organizational religious activity)	2.79 (1.11)	2.55 (1.45)
subscale 2 (non-organizational religious activity)	3.60 (1.95)	2.37 (1.91)
subscale 3 (intrinsic religiosity)	10.28 (3.49)	7.89 (3.97)
Self-reporting religiosity		
In general, how religious do you consider yourself?	3.01 (1.07)	2.37 (1.24)
How religious are your paternal family members in general?	3.26 (1.16)	3.93 (0.73)
Descriptive Statistics for <i>dysphorics</i> and non- <i>dysphorics</i>	N, CESD Score Mean (SD)	
Dysphorics	26, 27.15 (9.04)	18, 25.61 (10.07)
Non-dysphorics	27, 10.22 (3.30)	10, 11.27 (3.83)

\* *Note:* Military service is compulsory only for males aged between 18 and 49 according to the Constitution of the Islamic Republic of Iran.

## **2.2. Stimuli (moral dilemmas)**

Forty-eight stimuli from the original moral dilemma sets comprising 52 dilemmas in total (Foot, 1967; Greene et al., 2004, 2001; Moore et al., 2008; Thomson, 1976), and that have been systematized into four conceptual factors (Personal Force, Benefit Recipient, Evitability, and Intentionality) by Christensen et al. (2014), were used in this experiment. The present set includes four conceptual factors with two levels each, including Personal Force (Personal, Impersonal), Benefit Recipient (Self-beneficial, Other-beneficial), Evitability (Avoidable, Inevitable), and Intentionality (Accidental, Instrumental).

After receiving permission from the original authors, a translation and adaptation procedure of the dilemmas into Persian was carried out in compliance with procedures intended to maximize the normative equivalence between the two language versions (Beaton et al., 2000).

These translation and adaptation phases consisted of the following steps: 1) a Persian native speaker with a high level of English language proficiency (SS) translated the dilemma-set from English to Persian; 2) a second Persian native speaker with a high level of English language proficiency checked the translation and made some corrections (AJ); 3) two additional Persian native speakers with a high level of English language proficiency did the same process as in the first step for back-translation from Persian to English (ZP), and the author of the original version of the dilemmas (JFC) approved the accuracy of the back-translation; 4) all four authors reviewed all translations and attained a consensus on any discrepancies; 5) we presented the final version of the dilemma-set to two pilot participants (one male and one female) and asked them to go through the dilemmas and reply to the proposed solution for each dilemma (moral judgment) verbally.—After responding to all dilemmas, we interviewed these pilot participants regarding their impressions of each dilemma (these verbal responses were recorded on tape for documentation purposes). This procedure was followed to ensure that the Persian version of the dilemmas was understandable and adequately presented the dilemmatic situation to the reader. The final version of the dilemma-set in Persian language is accessible as Supplemental Content online ("Moral dilemma-set – in Persian," n.d.).

## **2.3. Materials (questionnaires)**

Participants completed a demographic questionnaire that asked them to report their age, gender, educational level, and to indicate whether they had completed military service. We collected two measures assessing participants' mood, including the *Visual Analogue Mood Scale* (VAMS; Luria, 1975) which consists of a question about the participant's current mood that is to be answered on a 9-point Likert scale from 1 (Very Sad) to 9 (Very Happy), and the *Center for Epidemiological Study Depression Scale* (CES-D) which screens for depressive symptomatology (Radloff, 1977; Persian version, Malakouti et al., 2015). The CES-D contains 20 questions with a 4-point Likert scale that probes for signs of depression. Scores range between 0 and 60. The cut-off score of 16 is indicative of depressive symptomatology. Reliability and validity of this questionnaire have been established for the Persian language version with a Cronbach's alpha of 0.85, split-half coefficients of 0.65, and test-retest reliability of 0.49 (Malakouti, Pachana, Naji, Kahani, & Saeedkhani, 2015).

To assess participants' religiosity, we used the Duke University Religion Index (DUREL; Koenig & Büssing, 2010). The DUREL comprises five items and responses are given on a 6-point Likert scale. Reliability for the Persian version of the questionnaire was previously established with Cronbach's alphas and test-retest correlations (0.86 and 0.93; 95% CI=.85,.97,  $n = 26$ ,  $p < .0001$ ; Hafizi et al., 2013). The authors of the original scale, Koenig & Büssing (2010), do not recommend summing all three subscales of the DUREL into a total overall religiosity score, but to examine each subscale score independently, and we followed this advice; the subscales include *subscale 1 (organizational religious activity)*, *2 (non-organizational religious activity)*, and *3 (intrinsic religiosity)*. Besides, two additional questions about participants' religiosity were included (*Religiosity Extra Question no. 1: 'In general, how much religious do you consider yourself?'*; REQ1; and *Religiosity Extra Question no. 2: 'How religious are your paternal family members in general?'*; REQ2 (because the paternal family in Iran is more dominant on children (Fathi, 1985)).

## **2.4. Materials (software)**

To present the moral dilemmas to participants, as well as all questionnaires, we used the free version of Limesurvey (<http://www.limesurvey.org/>). For data analysis, IBM SPSS Statistics v. 26.0.0.1 was used.

## **2.5. Procedure**

For recruitment, participants responded to a call that was advertised on student social media groups. Volunteers signed up via phone or text message. After establishing selection criteria were met (i.e., being older than 18 years, having Iranian nationality, and being native Persian speakers), participants were invited to the lab. All were reimbursed for their time with a course score credit. Upon arrival in the lab, participants were given an information sheet that described the experiment following the proposal made by Christensen et al. (2014). Participants were informed that their participation was voluntary and that they could withdraw from the experiment at any stage, without penalty. Subsequently, participants had the opportunity to ask questions and then participants signed the consent form and were directed to the online survey that was set up on a computer, running Limesurvey, to perform the task.

The order of presentation of the different elements of the experiment was as follows: Participants first completed the demographic questions followed by the core task, the moral judgment to 52 moral dilemmas (including four practice dilemmas which were discarded before analysis), and then followed the *Center for Epidemiological Study Depression Scale* (CES-D), the Duke University Religion Index (DUREL), and the *Visual Analogue Mood Scale* (VAMS).

For the moral judgment task, each dilemma was presented in three separate parts: First, participants were presented with the hypothetical situation (first paragraph of the dilemma). Participants then clicked the "next" button which showed the second paragraph that described the logical causation of participants' possible actions (e.g., if you do X, Y will happen). Finally, in the third paragraph of the dilemma, participants replied to a question that evoked moral judgment (e.g., "do you [action verb] so that...") using a 7-

point Likert scale anchored at 1 (No, I don't do it) and 7 (Yes, I do it). Participants did not have any contact with the experimenter until the end of the experiment when they were thanked for their participation and fully debriefed.

## **2.6. Analysis plan**

A  $2 \times 2 \times 2 \times 2$  RM factorial ANOVA was computed with the within-subject factors *Personal Force* (two levels: Personal Moral Dilemma (PMD) vs. Impersonal Moral Dilemma (IMD)), *Benefit Recipient* (two levels: Self-beneficial vs. Other-beneficial), *Evitability* (two levels: Avoidable vs. Inevitable harm), and *Intentionality* (two levels: Accidental vs. Instrumental harm). *Gender* was the between-subjects factor, and the variables *Mood*, *DUREL subscales 1, 2, and 3*, *REQ1*, *REQ2*, and *CES-D score* were included in the analysis as covariates. The above analysis was carried out with the Likert scale moral judgments (1-7) as the dependent variable. In addition, an RM ANOVA was performed with the factors *Personal Force*, *Benefit Recipient*, *Evitability*, and *Intentionality*, and with Reaction Time (RT) data as the dependent variable (see section 3.1.).

Subsequently, to investigate the influence of interindividual differences on moral judgment, a multiple linear regression was performed with the predictors *Gender*, *Mood (VAMS)*, *DUREL subscales 1, 2, and 3*, *REQ1*, *REQ2*, and *CES-D score*. The dependent variable was the Utilitarian Response Rate (URR). The URR ranges between 0 and 1 and is obtained by counting all moral judgment Likert responses above 4 (towards 7: "Yes, I do it") as Utilitarian responses, and the responses below 4 (toward 1: "No, I don't do it") as Deontological responses. Responses of "4" on the Likert scale ("neutral") were removed (see section 3.2.).

Finally, we performed a cross-cultural comparison with moral judgment data available in the literature. With this additional data, we were able to compare our moral judgment data from our Iranian sample with the moral judgment data of Spanish and Italian samples, again using the UUT, this time to compare data across studies (Christensen et al., 2014; Cecchetto et al., 2017).

As effect sizes, we report partial eta ( $\eta_p^2$ ), where .01 is considered a small effect size, .06 a medium effect, and .14 a large effect, and Cohen's *d* for t-tests (Cohen, 1988) (see section 3.3.).

### 3. Results

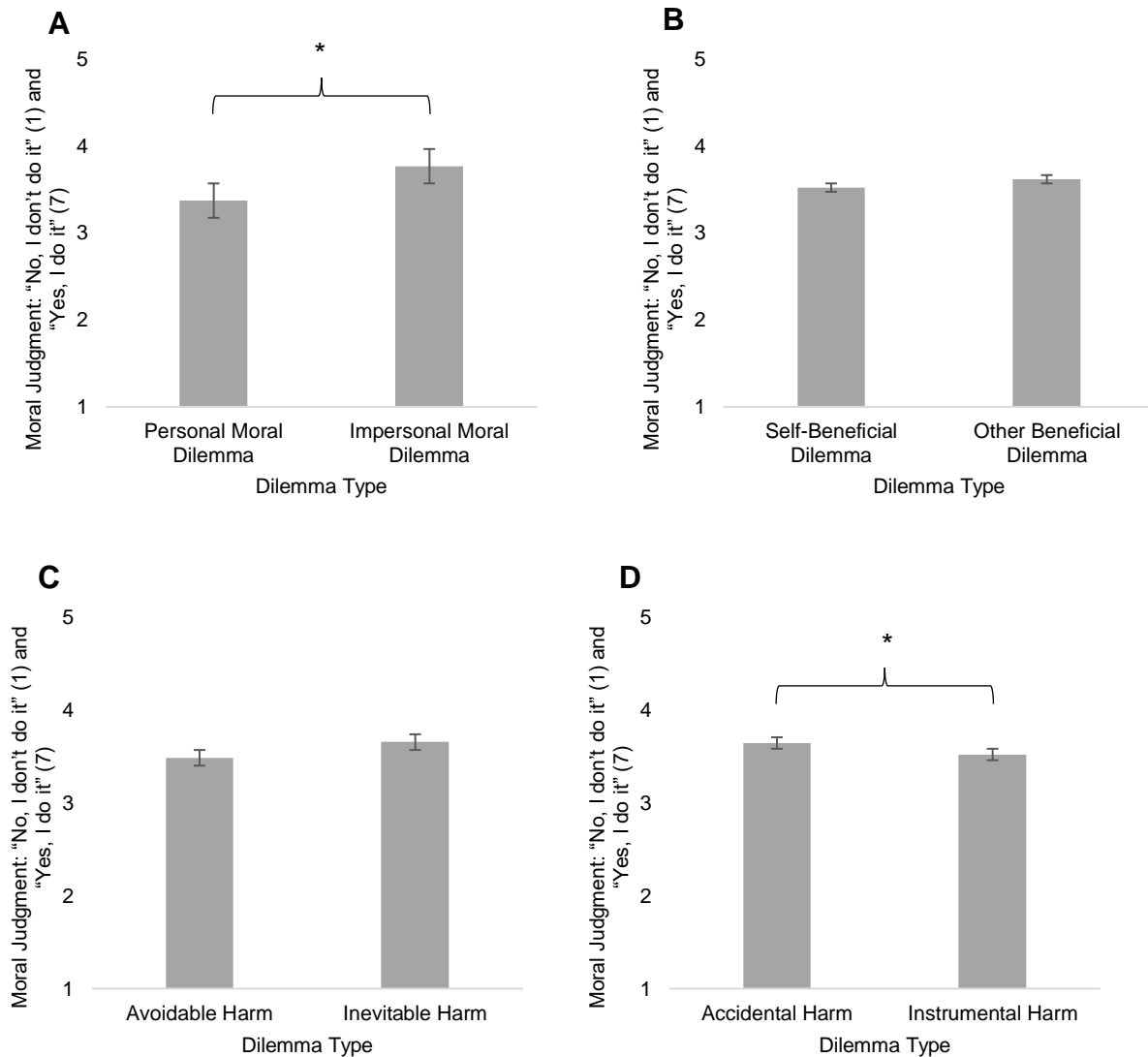
#### 3.1. Subjective ratings: moral judgment

Cronbach's alpha for moral judgments for the 48 test scenarios was very high (Cronbach's = 0.936), across all four dilemma categories (Cronbach's *Personal Force* = 0.942, *Benefit Recipient* = 0.839, *Evitability* = 0.916, and *Intentionality* = 0.923).

There were significant main effects for two of our four within-subject factors. In particular, of *Personal Force* [ $F_{(1,80)} = 5.156$ ;  $p = 0.026$ ;  $\eta_p^2 = 0.067$ ] and of *Intentionality* [ $F_{(1,80)} = 5.903$ ;  $p = 0.018$ ;  $\eta_p^2 = 0.076$ ]. Participants were less likely to commit harm in *PMD* ( $M = 3.37$ ;  $SD = 1.15$ ), than in *IMD* ( $M = 3.77$ ;  $SD = 1.25$ ) (*Personal Force*), and they were more likely to commit harm ( $M = 3.64$ ;  $SD = 1.18$ ) when the victim's death was *Accidental*, than when it was *Instrumental* ( $M = 3.52$ ;  $SD = 1.23$ ). No significant main effect was found for the two other within-subject factors, *Benefit Recipient* [ $F_{(1,80)} = 3.570$ ,  $p = 0.063$ ] and *Evitability* [ $F_{(1,80)} = 0.37$ ,  $p = 0.54$ ]. See **Figure 1**.

#### Figure 1

*Average Moral judgment as a function of the four factors*



*Note.* Likert scale responses of the two levels of each of the factors with a significant main effect. (A) Moral judgment Main Effect: Personal Force, (B) Moral judgment Main Effect: Benefit Recipient, (C) Moral judgment Main Effect: Evitability, (D) Moral judgment Main Effect: Intentionality. There was a main effect of Personal Force (panel A) and Intentionality (panel C). Participants were less likely to commit harm in PMD, than in IMD, and they were more likely to commit harm when the victim's death was Accidental than when it was Instrumental. No significant main effect was found for the two other within-subject factors, Benefit Recipient (panel B) and Evitability (panel D). Y-axis: Moral judgment (1 = No, I don't do it, i.e., deontological moral judgment; 7 = Yes, I do it, i.e., utilitarian moral judgment). For illustration purposes we have shortened the legend to be only between 1 to 5, however, the moral judgments were performed on a Likert scale of 1 to 7, as indicated in the methods section. Error bars indicate SE. \* =  $p < .05$ .

Among the six possible two-way interactions between our four within-subject factors, there were two significant interactions between *Evitability*  $\times$  *Intentionality* [ $F_{(1,80)} = 7.20$ ;  $p$

= 0.009;  $\eta_p^2 = 0.091$ ] and *Personal Force*  $\times$  *Evitability* [ $F_{(1,80)} = 4.13$ ;  $p = 0.046$ ;  $\eta_p^2 = 0.054$ ]. The means and interaction coefficients are shown in the **Table 2**.

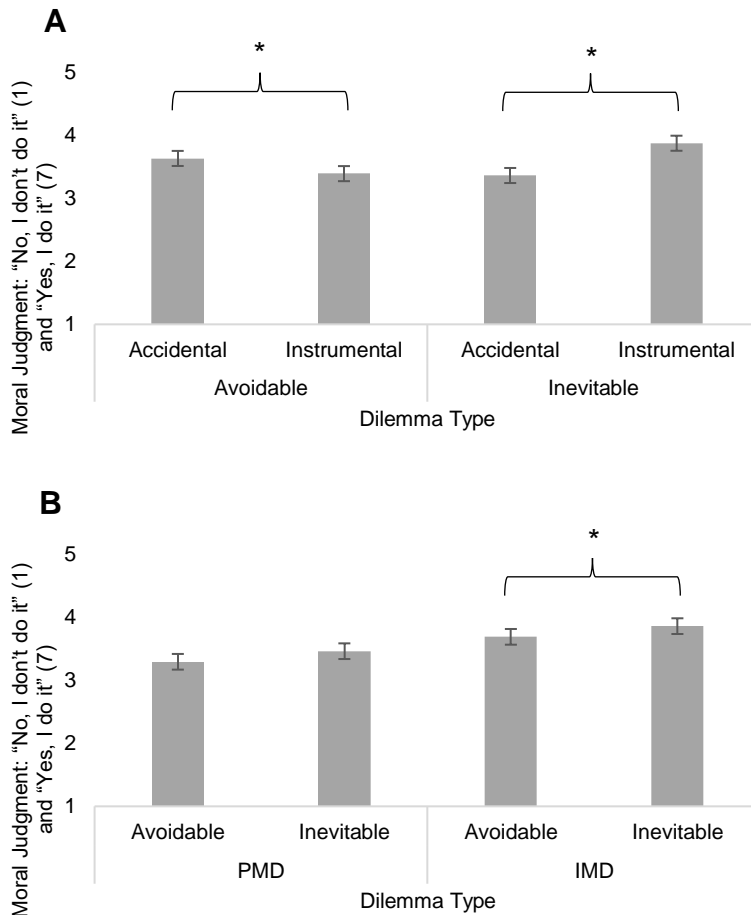
**Table 2**

*Summary table of the interactions (dependent variable: moral judgment, Likert scale rating; range: 1;7)*

		Factors		Descriptive		Interaction Coefficients		
Interactions		Factor 1	Factor 2	Mean	SD	$F_{(1, 80)}$	$p$	$\eta_p^2$
Evitability Intentionality	$\times$	Avoidable	Accidental	3.63	1.53	7.198	0.00	0.091
			Instrumental	3.39	1.81			
		Inevitable	Accidental	3.36	1.49			
			Instrumental	3.87	1.69			
Personal Evitability	$\times$	PMD	Avoidable	3.29	1.11	4.129	0.04	0.054
			Inevitable	3.46	1.31			
		IMD	Avoidable	3.68	1.23			
			Inevitable	3.85	1.36			

*Note.* Table of interaction coefficients for interactions between factors. There was a significant difference in moral judgments to *Avoidable-Accidental* dilemmas and *Avoidable-Instrumental* dilemmas, and in moral judgments to *Inevitable-Accidental* dilemmas and *Inevitable-Instrumental* dilemmas. Results showed a cross-over interaction: when harm was *Avoidable* (as compared to *Inevitable*), participants were less likely to commit it when the harm described in the dilemma was *Instrumental* than when it was *Accidental*, while for *Inevitable* harm participants were less likely to commit harm if it was *Accidental* than when it was *Instrumental*. In addition, participants were more likely to commit moral transgression in *IMDs* when harm was *Inevitable* rather than *Avoidable*.

T-tests were performed to break down the interactions. There was a significant difference in the responses to *Avoidable-Accidental* dilemmas ( $M = 3.63$ ,  $SD = 1.27$ ) and *Avoidable-Instrumental* dilemmas ( $M = 3.39$ ,  $SD = 1.20$ ); 95% CI [0.02, 0.45],  $t_{(80)} = 2.244$ ,  $p = 0.028$ . There was also a significant difference in the response to *Inevitable-Accidental* dilemmas ( $M = 3.36$ ,  $SD = 1.37$ ) and *Inevitable-Instrumental* dilemmas ( $M = 3.87$ ,  $SD = 1.31$ ); 95% CI [-0.36, -7.08],  $t_{(80)} = -7.086$ ,  $p < 0.001$ . This was a cross-over interaction: when harm was *Avoidable* (as compared to *Inevitable*), participants were less likely to commit it when the harm described in the dilemma was *Instrumental*, than when it was *Accidental*, while for *Inevitable* harm participants were less likely to commit harm if it was *Accidental* than when it was *Instrumental*. In addition, participants were more likely to commit moral transgression in *IMDs* when harm was *Inevitable* ( $M = 3.85$ ,  $SD = 1.31$ ), rather than *Avoidable* ( $M = 3.68$ ,  $SD = 1.31$ ). See **Figure 2** for an illustration of the results and tables **Table 2** and **Table 3** for the t-tests.

**Figure 2***Interactions of the 4 within-subject factors in the variable moral judgment*

*Note.* Likert scale responses for interactions between factors with. (A) Interactions between Evitability  $\times$  Intentionality, (B) Interactions between Personal Force  $\times$  Evitability. Mean Likert scale responses on the y-axis: 1 = No, I don't do it, i.e., deontological moral judgment; 7 = Yes, I do it, i.e., utilitarian moral judgment. Error bars indicate SE. \* =  $p < .05$ . There was a significant difference in the responses to *Avoidable-Accidental* dilemmas and *Avoidable-Instrumental* dilemmas. There was also a significant difference in the response to *Inevitable-Accidental* dilemmas and *Inevitable-Instrumental* dilemmas. This was a cross-over interaction: when harm was *Avoidable* (as compared to *Inevitable*), participants were less likely to commit it when the harm described in the dilemma was *Instrumental*, than when it was *Accidental*, while for *Inevitable* harm participants were less likely to commit harm if it was *Accidental* than when it was *Instrumental*. In addition, participants were more likely to commit moral transgression in *IMDs* when harm was *Inevitable* rather than *Avoidable*. For illustration purposes we have shortened the legend to be only between 1 to 5, however, the moral judgments were performed on a Likert scale of 1 to 7, as indicated in the methods section.

**Table 3***Follow-up paired t-tests to Break Down the Interactions in the Moral Judgment Task*



	<i>Mean</i>	<i>SE</i>	<i>t-test</i> <i>(80)</i>	<i>p</i>	<i>Cohens d</i>
(A) Tests to break down the interaction <i>Personal Force</i> × <i>Evitability</i>					
PERSONAL MORAL DILEMMAS					
Avoidable	3.29	0.12	-1.921	0.058	ns
Inevitable	3.46	0.14			
IMPERSONAL MORAL DILEMMAS					
Avoidable	3.68	0.14	-2.250	0.027	0.13
Inevitable	3.85	0.15			
(B) Tests to break down the interactions between <i>Evitability</i> × <i>Intentionality</i>					
AVOIDABLE HARM					
Accidental	3.627	0.14	2.244	0.028	0.19
Instrumental	3.386	0.13			
INEVITABLE HARM					
Accidental	3.356	0.15	-7.086	<0.001	0.38
Instrumental	3.867	0.14			

*Note:* T-tests. There was a significant difference in the moral judgments to *Avoidable-Accidental* dilemmas and *Avoidable-Instrumental*, and in moral judgments to *Inevitable-Accidental* dilemmas and *Inevitable-Instrumental* dilemmas. This was a cross-over interaction: when harm was *Avoidable* (as compared to *Inevitable*), participants were less likely to commit it when the harm described in the dilemma was *Instrumental*, than when it was *Accidental*, while for *Inevitable* harm participants were less likely to commit harm if it was *Accidental* than when it was *Instrumental*. In addition, participants were more likely to commit moral transgression in *IMDs* when harm was *Inevitable*, rather than *Avoidable*.

There was no significant main effect of the between-subjects factor *Gender* [ $F_{(1,80)} = 0.518$ ;  $p = 0.474$ ; *ns*] after controlling for mood, depressive symptomatology (as measured by the *CESD's* score) and religiosity: *Personal Force* × *Gender* [ $F_{(1,80)} = 0.303$ ;  $p = 0.583$ ; *ns*]; *Benefit Recipient* × *Gender* [ $F_{(1,80)} = 0.029$ ;  $p = 0.865$ ; *ns*]; *Evitability* × *Gender* [ $F_{(1,80)} = 0.546$ ;  $p = 0.462$ ; *ns*]; *Intentionality* × *Gender* [ $F_{(1,80)} = 0.619$ ;  $p = 0.434$ ; *ns*]. See

supplementary materials section 2.2 for an additional analysis with cases weighted by gender.

There were several interactions between covariates of our model (e.g., *CESD's score*, *Mood and Religiosity*) and the four main factors of our dilemma categories: *Personal Force*  $\times$  *CESD's score* [ $F_{(1,81)} = 6.451$ ;  $p = 0.013$ ;  $\eta_p^2 = 0.085$ ], *Benefit Recipient*  $\times$  *Mood* [ $F_{(1,81)} = 5.743$ ;  $p = 0.019$ ;  $\eta_p^2 = 0.077$ ], *Evitability*  $\times$  *Religion Extra question no. 1* (which was 'In general, how religious do you consider yourself?') [ $F_{(1,81)} = 4.619$ ;  $p = 0.035$ ;  $\eta_p^2 = 0.063$ ], *Evitability*  $\times$  *Religion extra question no. 2* (which was 'How religious are your paternal family members in general?') [ $F_{(1,81)} = 4.012$ ;  $p = 0.049$ ;  $\eta_p^2 = 0.055$ ], *Intentionality*  $\times$  *Mood* [ $F_{(1,81)} = 9.572$ ;  $p = 0.003$ ;  $\eta_p^2 = 0.122$ ] on moral judgment (utilitarian vs. deontological). There was also a significant between-subjects main effect of the covariate *DUREL subscale 3* [ $F_{(1,80)} = 7.26$ ;  $p = 0.009$ ;  $\eta_p^2 = 0.092$ ]. See **Table 4** for an overview of these interactions. We ignored 3- and 4-way interactions.

**Table 4**

*Summary table of the interactions between within-subjects' factors and covariates*

Interactions	Interaction Coefficients		
	$F(1, 80)$	$p$	$\eta_p^2$
Personal Force $\times$ CESD's score	5.880	0.018	0.075
Benefit Recipient $\times$ Mood	5.880	0.018	0.075
Evitability $\times$ REQ1	4.837	0.031	0.063
Evitability $\times$ REQ2	4.012	0.049	0.055
Intentionality $\times$ Mood	9.733	0.003	0.119

*Note:* CES-D: the *Center for Epidemiological Study Depression Scale* screens for depressive symptomatology (Radloff, 1977; Farsi version, Malakouti et al., 2015); VAMS: *Visual Analogue Mood Scale* (Luria, 1975); REQ1: *Religiosity Extra Question no. 1*: 'In general, how much religious do you consider yourself?'; REQ2: *Religiosity Extra Question no. 2*: 'How religious are your paternal family members in general?'

To explore the contribution of these interindividual differences to moral judgment, we performed a multiple regression.

### 3.2. Multiple Linear Regression (interindividual differences)

To investigate the influence of interindividual differences on moral judgment, a multiple linear regression was performed with the predictors *Gender*, *Mood (VAMS)*, *DUREL subscales 1, 2, and 3*, *REQ1*, *REQ2*, and *CES-D* score. The dependent variable was the Utilitarian Response Rate (URR). The URR ranges between 0 and 1 and is obtained by counting all moral judgment Likert responses above 4 (towards 7: “Yes, I do it”) as Utilitarian responses, and the responses below 4 (toward 1: “No, I don’t do it”) as Deontological responses. Responses of “4” on the Likert scale (“neutral”) were removed. The regression equation was not significant,  $F(8, 72) = 1.247$ ,  $p = 0.285$ , with an  $R^2$  of 0.024, meaning that only 2.4% of the variance was explained by this model. Of all the variables entered into the model, only *DUREL subscale 3 (intrinsic religiosity)* was a significant predictor (*DUREL subscale 3*:  $t = -2.227$ ,  $b = -0.424$ ,  $p = 0.029$ ). The negative t-value suggests the reversal in the directionality of the effect in which participants URR decreased 0.027 points for each point of *DUREL subscale 3*. See **Table 5** for this regression.

**Table 5**  
*Multiple Linear Regression Model Predicting the URR*

		<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
Model						
1	Constant	0.219	0.193		1.113	0.261
	Gender	0.058	0.063	0.114	0.920	0.360
	Mood	0.016	0.020	0.102	0.799	0.427
	CES-D	0.001	0.003	0.066	0.520	0.605
	DUREL subscale 1	-0.008	0.035	-0.042	-0.228	0.821
	DUREL subscale 2	0.002	0.020	0.019	0.108	0.914
	DUREL subscale 3	-0.027	0.012	-0.424	-2.227	0.029*
	REQ1	0.057	0.046	0.276	1.239	0.219
	REQ2	0.020	0.027	0.089	0.717	0.476

*Note.*  $N = 81$ . *B* = unstandardized Beta; *SE* = Standard Error;  $\beta$  = standardized Beta coefficient; \* =  $p < .05$ ; VAMS: *Visual Analogue Mood Scale* (Luria, 1975); CES-D: the *Center for Epidemiological Study Depression Scale* screens for depressive symptomatology (Radloff, 1977; Farsi version, Malakouti et al., 2015); the Duke University Religion Index (DUREL; Koenig & Büssing, 2010) included *subscale 1 (organizational religious activity)*, *2 (non-organizational religious activity)*, and *3 (intrinsic religiosity)*; REQ1: *Religiosity Extra Question no. 1: ‘In general, how much religious do you consider yourself?’*; REQ2: *Religiosity Extra Question no. 2: ‘How religious are your paternal family members in general?’*.

### 3.3. Cross-cultural analysis

Subsequently, an item analysis was performed to compare moral judgment to this dilemma set and its four different factors, across three different cultures. For this purpose, data from previously published studies with Italian and Spanish samples (kindly made available by Cecchetto et al., 2017; and by Christensen et al., 2014) were included in the now following analyses.

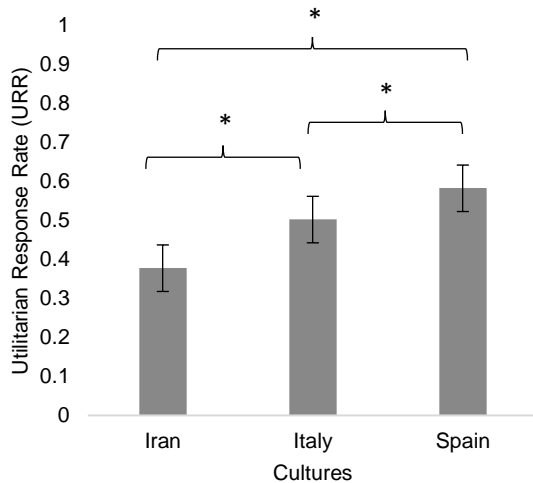
Two dilemmas from the Iranian and Italian sets were not included in the present analyses because they were not available in the Spanish data set (Cliffhanger (a and b)). Likewise, four dilemmas from the Italian set were not included in the present analyses because they were not available in the Spanish and Iranian data sets (Missile (a and b), and Bomb in the Bank (a and b)). This the following analyses are based on a dilemma set of 46 moral dilemmas.

For this item analysis, a 4×3 RM ANOVA was conducted. The variable *culture* was our within-items factor (3 levels: Iran, Italy, Spain), and the four categories of the dilemmas were our between-items factors, namely, *Personal Force* (PMD vs. IMD), *Benefit Recipient* (Self-beneficial vs. Other-beneficial), *Evitability* (Avoidable vs. Inevitable harm), and *Intentionality* (Accidental vs. Instrumental harm). The dependent variable was the Utilitarian Response Rate (URR). The URR ranges between 0 and 1 and is obtained by counting all moral judgment Likert responses above 4 (towards 7: “Yes, I do it”) as Utilitarian responses, and the responses below 4 (toward 1: “No, I don’t do it”) as Deontological responses. Responses of “4” on the Likert scale (“neutral”) were removed. The average number of Utilitarian Responses was obtained for each of the 46 dilemmas (the Spanish data had eliminated two dilemmas (21 and 22), so we eliminated these very two dilemmas from Italian and our samples too): The number of 1s (Likert responses above 4 towards 7: “Yes, I do it”) divided by the number of all participants responses for each dilemma. We call this the Utilitarian Response Rate (URR), based on the conjecture by Cecchetto et al. (2017).

There was a significant main effect for our within-items factor *Culture* [ $F_{(1,80)} = 52.959$ ;  $p < 0.001$ ;  $\eta_p^2 = 0.638$ ]. To follow up the main effect of *Culture*, paired sample t-tests were conducted. to compare the URR between, respectively, Iranian, Italian, and Spanish samples, in 3 pair-wise comparisons. There were significant differences in the URR of moral judgment between the Iranian and Italian samples ( $t_{(45)} = -4.51$ ,  $p < 0.001$ ), between the Iranian and Spanish samples ( $t_{(45)} = -8.10$ ,  $p < 0.001$ ), and between the Italian and Spanish samples ( $t_{(45)} = -4.79$ ,  $p < 0.001$ ). On average, Iranian URR was 0.12 points lower (more deontological), than the Italian URR (95% CI [-0.18, -0.07]), and it was 0.20 points lower (more deontological) than the Spanish URR (95% CI [-0.11, -0.05]). The Italian URR was 0.08 points lower (more deontological), than the Spanish URR (95% CI [-0.11, -0.05]). See **Figure 3**.

**Figure 3**

*Utilitarian Response Rate (URR) of Iranian, Italian, and Spanish sample's URR across all moral dilemmas (The graph illustrates the main effect of the between-items variable Culture)*



*Note.* Likert scale responses of the two levels of each of the factors with a significant main effect. Y-axis: 0 = No, I don't do it, i.e., deontological moral judgment; 1 = Yes, I do it, i.e., utilitarian moral judgment. Error bars indicate SE. \* =  $p < .05$ .

Three of four possible two-way interactions between our four between-items Dilemma factors and the within-items factor *Culture* were significant: *Culture* × *Personal Force* [ $F_{(2,29)} = 6.037$ ;  $p = 0.004$ ;  $\eta_p^2 = 0.168$ ], *Culture* × *Benefit Recipient* [ $F_{(2,29)} = 7.900$ ;  $p = 0.001$ ;  $\eta_p^2 = 0.208$ ], and *Culture* × *Intentionality* [ $F_{(2,29)} = 4.340$ ;  $p = 0.017$ ;  $\eta_p^2 = 0.126$ ]. Averages and interaction coefficients are shown in **Table 6**.

**Table 6**

*The Interactions Between Dilemma Type and Culture*

Interactions	Factors		Dependent variable means	Interaction Coefficients		
	Factor 1	Factor 2	URR	$F_{(2,29)}$	$p$	$\eta_p^2$
<i>Culture</i> × <i>Personal Force</i>	Iran	PMD	0.34	6.037	0.004	0.168
		IMD	0.41			
	Italy	PMD	0.44			
		IMD	0.57			
	Spain	PMD	0.47			
		IMD	0.69			
<i>Culture</i> × <i>Benefit Recipient</i>	Iran	Self	0.36			
		Other	0.38			
	Italy	Self	0.57			

Interactions	Factors		Dependent variable means	Interaction Coefficients		
	Factor 1	Factor 2	URR	$F_{(2,29)}$	$p$	$\eta_p^2$
<i>Culture × Intentionality</i>	Spain	Other	0.44	7.900	0.001	0.208
		Self	0.64			
		Other	0.52			
	Iran	Accidental	0.37	4.340	0.017	0.126
		Instrumental	0.38			
	Italy	Accidental	0.56			
		Instrumental	0.45			
	Spain	Accidental	0.60			
		Instrumental	0.56			

Note. dependent variable: *Utilitarian Response Rate*; range: 0;1

For the sake of completeness of these analyses, we also report the results of the comparisons within each culture. Of course, these within-culture comparisons for the Spanish (Christensen, Flexas, Calabrese, Gut, & Gomila, 2014) and Italian (Cecchetto, Rumiati, & Parma, 2017) samples were reported in the respective original papers.

We conducted 4 independent-sample t-tests to compare every two levels of the within-item variables of Dilemma Type. For the *Personal Force* factor, there was a significant difference in the URR of the Spanish sample for *PMD* ( $M = 0.48$ ;  $SD = 0.26$ ) and *IMD* ( $M = 0.68$ ;  $SD = 0.21$ ); ( $t_{(44)} = -2.90$ ,  $p = 0.006$ ); the Spanish sample's URR was 0.20 points higher (more utilitarian) when the dilemma type was *IMD* (95% CI [-3.42, -0.06]). The comparisons between *IMD* and *PMD* were not significant between the two other cultures (Iranian and Italian).

Regarding the *Intentionality* factor, there was a significant difference in the URR in the Italian sample between *Accidental* ( $M = 0.60$ ;  $SD = 0.22$ ) and *Instrumental* harm ( $M = 0.43$ ;  $SD = 0.22$ ); ( $t_{(44)} = 2.58$ ,  $p = 0.013$ ); the Italian sample's URR was 0.17 points higher (more utilitarian) when the dilemma type was *Accidental* (95% CI [0.04, 0.31]). The comparison between *Instrumental* and *Accidental* harm was not significant in two other cultures (Iranian and Spanish), and regarding *Evitability* and *Benefit Recipient* factors none of the comparisons were significant (all  $ps > 0.05$ ).

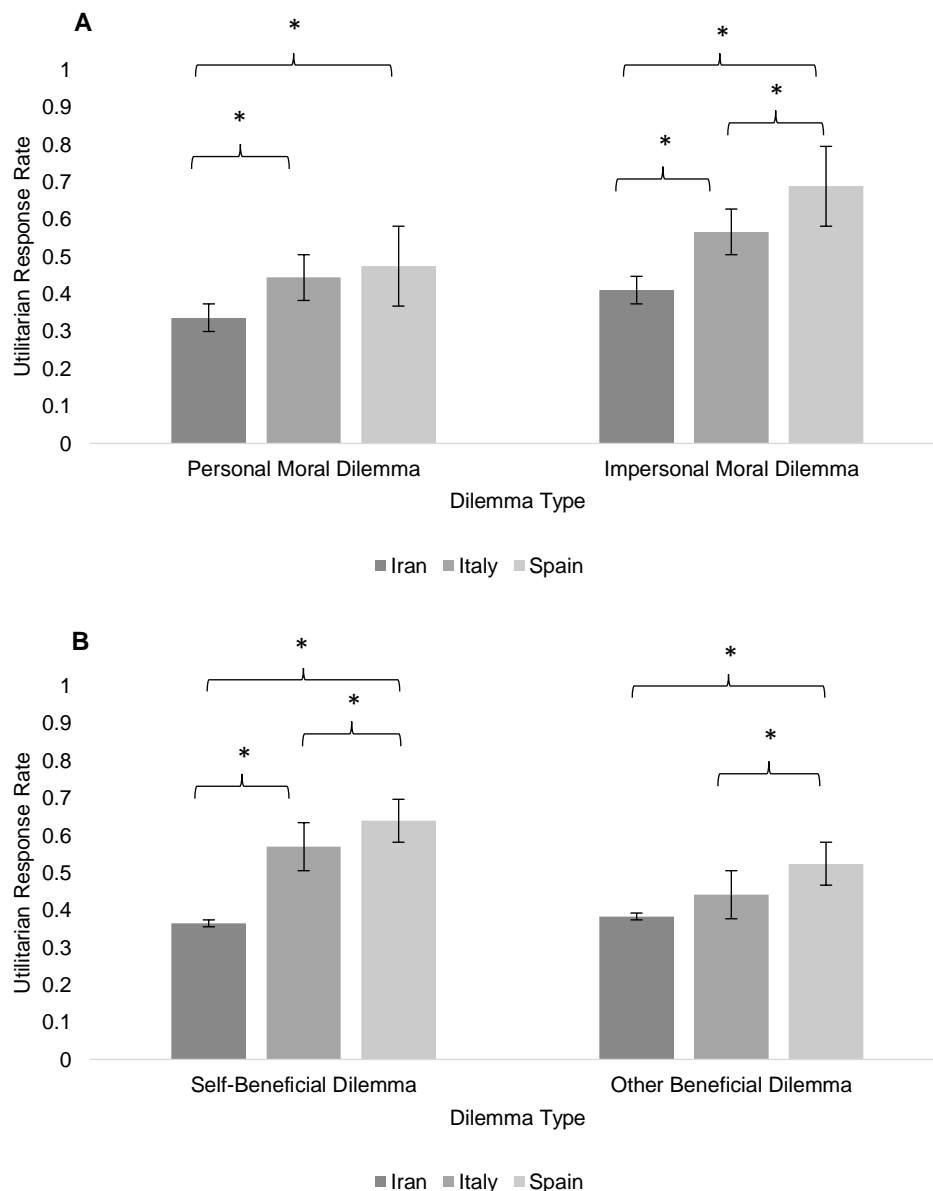
To follow up the significant interactions, to compare the Iranian, Italian, and Spanish samples' URR to our four different types of moral dilemmas, we conducted four paired sample t-tests, comparing the three cultures' URR pair-wise for each of the eight dilemma categories (four factors with 2 levels each).

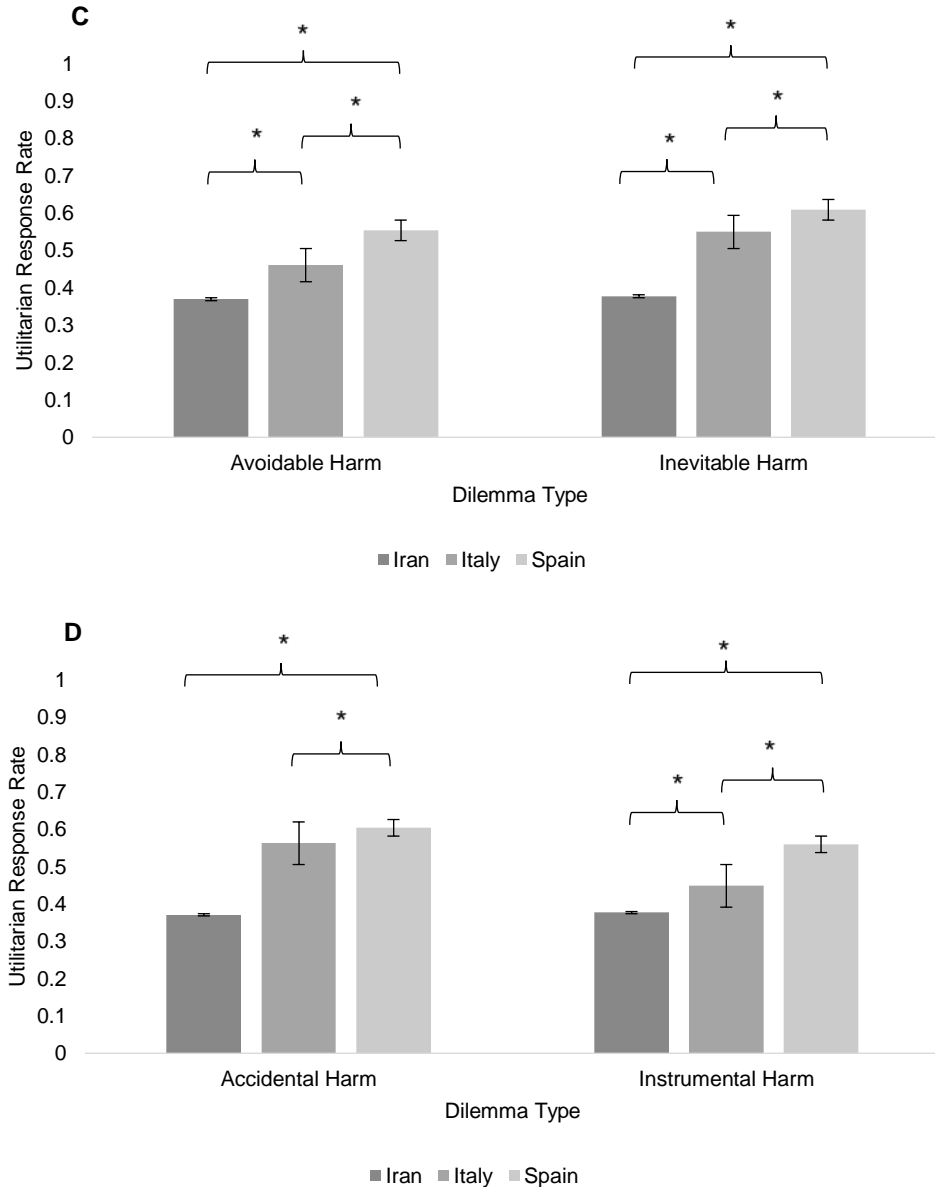
For the factor *Personal Force*, there were significant differences in the URR to *PMD* between Iranian and Italian ( $t_{(22)} = -2.91$ ,  $p = 0.008$ ), and Iranian and Spanish ( $t_{(22)} = -4.23$ ,  $p < 0.001$ ) samples. On average, Iranian URR to *PMD* was 0.10 points lower (more deontological) than the Italian URR (95% CI [-0.17, -0.07]), and the Iranian URR was 0.14 points lower than the Spanish URR to *PMD* (more deontological) (95% CI [-0.20, -0.14]). There were also significant differences in the URR to *IMD* between Iranian and Italian ( $t_{(22)} = -3.43$ ,  $p = 0.002$ ), and Iranian and Spanish ( $t_{(22)} = -7.95$ ,  $p < 0.001$ ), and Italian and

Spanish ( $t_{(22)} = -6.37, p < 0.001$ ) samples. On average, Iranian URR to *IMD* was 0.15 points lower than Italian URR (more deontological) (95% CI [-0.24, -0.06]), Iranian URR was 0.27 points lower than Spanish URR to *IMD* (more deontological) (95% CI [-0.34, -0.20]), and Italian URR was 0.12 points lower than Spanish URR to *IMD* (more deontological) (95% CI [-0.16, -0.08]); see **Figure 4, A**.

**Figure 4**

*Utilitarian Response Rate (URR) of Iranian, Italian, and Spanish participants Moral judgment as a function of the four factors*





*Note.* Likert scale responses of the two levels of each of the factors with a significant main effect. (A) Interactions between URR of moral judgment, Culture and Personal Force, (B) Interactions between URR of moral judgment, Culture and Benefit Recipient, (C) Interactions between URR of moral judgment, Culture and Evitability, (D) Interactions between URR of moral judgment, Culture and Intentionality. Y-axis: 0 = No, I don't do it, i.e., deontological moral judgment; 1 = Yes, I do it, i.e., utilitarian moral judgment. Error bars indicate SE. \* =  $p < .05$ .

For the factor *Benefit Recipient*, there were significant differences in the URR to Self-beneficial dilemmas between Iranian and Italian ( $t_{(21)} = -5.49, p < 0.001$ ), Iranian and Spanish ( $t_{(21)} = -7.97, p < 0.001$ ), and Italian and Spanish ( $t_{(21)} = -3.08, p = 0.006$ ) samples. Iranian URR to Self-beneficial dilemmas was 0.19 points lower than Italian (more deontological) (95% CI [-0.26, -0.12]), and Iranian URR was 0.27 points lower than



Spanish URR to Self-beneficial dilemmas (more deontological) (95% CI [-0.34, -0.20]). There were also significant differences between the URR to Other-beneficial dilemmas for Iranian and Spanish ( $t_{(23)} = -4.30, p < 0.001$ ), and Italian and Spanish samples ( $t_{(23)} = -3.62, p = 0.001$ ). On average, Iranian URR was 0.15 points lower than Spanish URR to Other-beneficial dilemmas (more deontological) (95% CI [-0.22, -0.08]), and Italian URR was 0.09 points lower than Spanish URR to Other-beneficial dilemmas (more deontological) (95% CI [-0.13, -0.03]); see **Figure 4, B**.

For the factor *Evitability*, there were significant differences in the URR to Avoidable harm between Iranian and Italian ( $t_{(23)} = -2.31, p = 0.030$ ), Iranian and Spanish ( $t_{(23)} = -5.19, p < 0.001$ ), and Italian and Spanish ( $t_{(23)} = -4.56, p < 0.001$ ) samples. On average, Iranian URR to Avoidable harm dilemmas was 0.08 points lower than Italian (more deontological) (95% CI [-0.15, -0.01]), and 0.18 points lower than the Spanish sample's URR (more deontological) (95% CI [-0.25, -0.10]), and Italian URR was 0.10 lower than the Spanish sample's (more deontological) (95% CI [-0.14, -0.05]). There were also significant differences between URR to Inevitable harm dilemmas for Iranian and Italian ( $t_{(21)} = -4.12, p < 0.001$ ), and Iranian and Spanish ( $t_{(21)} = -6.26, p < 0.001$ ), and Italian and Spanish samples ( $t_{(21)} = -2.36, p = 0.028$ ). Iranian URR to Inevitable harm dilemmas was 0.17 points lower than Italian (more deontological) (95% CI [-0.26, -0.09]), and 0.23 points lower than the Spanish sample's URR (more deontological) (95% CI [-0.31, -0.16]), and Italian URR was 0.06 points lower than the Spanish sample's (more deontological) (95% CI [-0.12, -0.01]); see **Figure 4, C**.

For the factor *Intentionality*, there were significant differences between the URR to Accidental harm dilemmas for Iranian and Spanish ( $t_{(26)} = -5.29, p < 0.001$ ), and Italian and Spanish ( $t_{(26)} = -4.22, p < 0.001$ ) samples. Iranian URR to Accidental harm dilemmas was 0.16 points lower than Spanish (more deontological) (95% CI [-0.22, -0.10]), and Italian URR was 0.10 points lower than Spanish URR (more deontological) (95% CI [-0.15, -0.05]). There was not significant difference between Iranian and Italian for accidental harm dilemmas ( $t_{(26)} = -1.766, p = 0.089$ ) (95% CI [-0.13, 0.01]). There were also significant differences between the URR to Instrumental harm dilemmas for Iranian and Italian samples ( $t_{(18)} = -5.58, p < 0.001$ ), Iranian and Spanish samples ( $t_{(18)} = -6.60, p < 0.001$ ), and Italian and Spanish samples ( $t_{(18)} = -2.44, p = 0.028$ ). Iranian URR was 0.22 points lower than Italian URR to Instrumental harm dilemmas (more deontological) (95% CI [-0.30, -0.14]), and 0.27 points lower than the Spanish sample's URR (more deontological) (95% CI [-0.35, -0.18]), and Italian URR was 0.04 points lower than the Spanish sample's (more deontological) (95% CI [-0.09, -0.01]); see **Figure 4, D**.

See supplementary materials section 2.1 for Reaction time results.

#### 4. Discussion

The aim of the current study was to translate a moral dilemma set to Persian language and to provide normative moral judgment data from a sample of Iranian participants. With this, we would like to lay the foundations for future cross-cultural research on moral judgment including a much under-researched population, Iranian participants. We based our procedure on the roadmap of a previous moral dilemma validation study, from which also the moral dilemma set for the present study was taken (Christensen et al., 2014).

Data from Iranian participants' moral judgment confirmed the four-factor structure of the dilemma set (*Personal Force*, *Benefit Recipient*, *Evitability*, and *Intentionality*), that had previously been described for other cultures, including Spanish and Italian samples. When harm was described as Personal, people tended to make more deontological moral judgments, and when the harm was impersonal, they made more utilitarian moral judgments. In other words, when the harm was presented as distant and spatially isolated from the agent, participants were more likely to perform this moral transgression than when the harm was described as close-up and giving the appearance of murder with bare hands. For the *Intentionality* factor; when harm was Instrumental, people tended to make more deontological judgments, as compared to when the harm was Accidental. These results confirm findings of previous research from all over the world (Cecchetto et al., 2017; Christensen et al., 2014; Greene et al., 2001; Moore et al., 2008).

Furthermore, and also in accordance with previous work, interactions between the four factors showed that when the death of the victim was *Avoidable*, participants were less likely to commit *Instrumental*, than *Accidental* harm. While, when the death of the victim was *Inevitable* participants were more likely to commit *Instrumental* than *Accidental* harm. In other words, when the victim of the dilemma is going to die “anyway”, participants are less reluctant to commit a moral transgression and “to use” the death of the victim for the “greater good”, according to Utilitarian considerations, but not when the death of the person could have been avoided. In the IMDs (not in the PMDs) participants were more likely to engage in moral transgression in exchange for the greater good, when harm was *Inevitable* rather than *Avoidable*. This means when the death of a victim is explained in the dilemma as *Inevitable* (“would have died anyway”), participants are more likely to commit the transgression, when the harm was also described as impersonal.

A secondary goal of this research was to look into gender differences in the participants' moral judgment and to control for other covariates that may affect the participant's moral judgment, including religiosity and mood (Gawronski, Conway, Armstrong, Friesdorf, & Hütter, 2018; Saroglou & Craninx, 2021).

In previous research, results regarding gender remain inconclusive (Banerjee et al., 2010; Capraro & Sippel, 2017; Eagly & Crowley, 1986; Eisenberg et al., 1989; Friesdorf et al., 2015; Fumagalli et al., 2010; Gilligan & Attanucci, 1988; Harenski, Antonenko, Shane, & Kiehl, 2008; Jaffee & Hyde, 2000; Lennon & Eisenberg, 1987; Petrinovich & O'Neill, 1996; Reverter-Bañón, 2019; Rueckert & Naybar, 2008), and they remain so, also in our study. Our inconclusive results regarding the gender variable could be due to the fact that our sample size was unequal in terms of gender. Therefore, we ran an additional analysis, weighting the cases for gender; see supplementary materials.

We assessed participants' level of religiosity by means of the DUREL (Malakouti et al., 2015), plus two extra religiosity questions (*Religiosity Extra Question no. 1: 'In general, how much religious do you consider yourself?'; REQ1; and Religiosity Extra Question no. 2: 'How religious are your paternal family members in general?'; REQ2*). A multiple linear regression showed that only the DUREL subscale 3 significantly impacted participants' moral judgments in our sample; the more religious participants were, the more deontological were their responses (lower Utilitarian Response Rate), which is in accordance with a pattern of results found by (Christensen et al., 2012). The other interindividual difference variables including religiosity, mood (VAMS; Luria, 1975), and chronic mood (CES-D; Radloff, 1977; Persian version, Malakouti et al., 2015) were not significant predictors in the model.

After our main analysis, outlined above, we conducted some additional cross-cultural analyses, where we compared the results from our data set with Iranian participants with the data of two previous moral dilemma validations, one using this very dilemma set in Italian (Cecchetto, Rumiati, & Parma, 2017); and one using it in Spanish (Christensen et al., 2014). Results from our cross-cultural comparison showed that Iranian's moral judgments were more deontological in general, than both the Italian and Spanish participants' moral judgments. Besides, Italian participants' moral judgments were more deontological, than Spanish participants' moral judgments. Future cross-cultural assessments may include also measures of the level of religiosity between cultures, welfare coefficients, threat-to-life level, as well as socio-economic variables, to allow for cross-cultural and methodological comparability. These variables were not assessed within the present research and may well be as important as simply the variable "culture" in cross-cultural research, as they act as confounders or modulators of individuals' moral judgment, regardless of culture.

Summing up, in the present study, we translated and validated the first moral dilemma-set in Persian. We were able to confirm the four-factor structure of the classical moral dilemma set; Iranian participants' moral judgments were sensitive to Personal Force, Benefit Recipient, Evitability, and Intentionality. Besides, when compared to Spanish and Italian moral judgment data available in the literature, Iranian participants' moral judgments were more deontological in general, which may be explained by the fact that Iran is a country living in crisis and at the brink of war for almost four decades now, and the situations portrayed in the moral dilemmas are not as unlikely to the lives of people living in Iran, as they may be to research participants from WEIRD cultures. We hope this moral dilemma set in Persian will provide a valuable tool for gathering data from all Persian speakers, including people who are living in Iran, Afghanistan, Tajikistan, and Dagestan.

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