



# Acceptability and emotional states in moral dilemmas across sex: a cross-cultural analysis

Aline Ponzoni<sup>1</sup> , Irani Iracema de Lima Argimon

Pontifícia Universidade Católica do Rio Grande do Sul – PUC-RS, Porto Alegre-RS, Brasil

María del Carmen Moret-Tatay

Universidad Católica de Valencia San Vicente Mártir, Espanha

Anna Maria Giannini , Pierluigi Cordellieri

University of Rome, Itália

## ABSTRACT

Studies have investigated cognitive and emotional processes related to moral judgment, with recent findings showing sex-related differences in moral reasoning. This study aimed to investigate sex differences in acceptability and emotional states in relation to resolving moral dilemmas, comparing Brazil and Spain. The sample consisted of: 333 Brazilian participants (46.2% men and 53.8% women) and 292 Spanish participants (45.5% men and 54.5% women), aged between 18 and 39 years. They read and judged five utilitarian and deontological moral dilemmas. Main results: men presented higher scores in acceptability and lower scores in emotional states; the Spanish subsample scored higher in both variables; there was no interaction between gender and country; sex predicted acceptability only in the second utilitarian dilemma. The results suggest that moral transgressions are more acceptable to men and Spanish people. This suggests that sociocultural factors are important for a proper understanding of morality.

*Keywords:* sex differences; moral judgment; moral reasoning; utilitarian; deontological.

## RESUMO – Aceitabilidade e estados emocionais em dilemas morais entre sexos: uma análise intercultural

Estudos têm investigado processos cognitivos e emocionais relacionados ao julgamento moral e achados recentes mostraram diferenças relacionadas ao sexo no raciocínio moral. Este estudo teve como objetivo investigar as diferenças de sexo na aceitabilidade e nos estados emocionais na resolução de dilemas morais, comparando Brasil e Espanha. A amostragem foi: 333 participantes brasileiros (46,2% do sexo masculino e 53,8% do sexo feminino) e 292 espanhóis (45,5% masculino e 54,5% feminino), com idades entre 18 e 39 anos. Eles leram e julgaram cinco dilemas morais utilitaristas e deontológicos. Principais resultados: os do sexo masculino apresentaram escores maiores em aceitabilidade e menores em estados emocionais; a subamostra espanhola apresentou escores maiores em ambas as variáveis; não teve interação entre as variáveis sexo e país; o sexo previu a aceitabilidade apenas no 2º dilema utilitarista. Os resultados sugerem maior propensão a transgressão moral na subamostra espanhola e no sexo masculino. Assim, fatores socioculturais são importantes para compreender adequadamente a moralidade.

*Palavras-chave:* diferenças de sexo; julgamento moral; raciocínio moral; utilitarista; deontológico.

## RESUMEN – Aceptabilidad y estados emocionales en dilemas morales entre sexos: un análisis intercultural

Los estudios han investigado procesos cognitivos y emocionales relacionados con el juicio moral, y hallazgos recientes han mostrado diferencias de sexo en esto. El objetivo de este estudio fue investigar las diferencias de sexo en aceptabilidad y estados emocionales en la resolución de dilemas morales, comparando Brasil y España. La muestra incluyó: 333 brasileños (46,2% hombres y 53,8% mujeres) y 292 españoles (45,5% hombres y 54,5% mujeres), con 18 a 39 años. Ellos leyeron y juzgaron cinco dilemas morales utilitaristas y deontológicos. Principales resultados: los hombres obtuvieron puntuaciones mayores en aceptabilidad y menores en estados emocionales; la submuestra española presentó puntuaciones mayores en ambas variables; no hubo interacción entre sexo y país; el sexo predijo aceptabilidad solo en el segundo dilema utilitarista. Los resultados sugieren mayor propensión a la transgresión moral en la submuestra española y en los hombres. Así, los factores socioculturales son importantes para comprender la moralidad.

*Palabras clave:* diferencias de sexo; juicio moral; razonamiento moral; utilitarista; deontológico.

The moral sense is a key element for the human being, who frequently encounter complex and stressful decisions. On a cognitive level, the literature has demonstrated distinct outcomes using electromagnetic resonances or fMRI techniques.

Classic studies on moral judgment (Greene & Haidt, 2002; Greene et al., 2004; Harenski & Hamann, 2006) have identified neural activity patterns by presenting impersonal dilemmas. These studies have revealed that impersonal moral dilemmas elicit less activation in

<sup>1</sup> Endereço para correspondência: Rua Borges do Canto, nº 110/701, 90630-020, Petrópolis, RS. E-mail: alineponzoni.psi@hotmail.com

Paper derived from the master's thesis by Aline Ponzoni, supervised by the second author (Irani Iracema de Lima Argimon), defended in 2021 in the postgraduate program in Psychology at the Pontifical Catholic University of Rio Grande do Sul.

emotional areas compared to personal and non-moral dilemmas. Furthermore, the research highlights differences between moral dilemmas classified as personal and impersonal, relating to three specific variables: the type of harm, particularly when resulting in death; the target (single or multiple); and the deviation of the dilemma to a third person.

In a meta-analysis (Boccia et al., 2017a) under an Activation Likelihood Estimation (ALE) analysis, possible neuronal segregation was identified based on whether the perspective was first-person or third-person. This segregation refers to networks involved in moral reasoning and emotional regulation, including the orbitofrontal cortex, insula, amygdala, anterior cingulate cortex, and both the anterior and posterior cingulate cortex. Despite criticisms between personal and impersonal moral dilemmas (Boccia et al., 2017b; McGuire et al., 2009), previous findings highlight differences between cognitive and emotional processes in moral judgment.

According to the dual processing theory of dilemma judgments (Greene et al., 2004), two different types of dilemmas can be distinguished: utilitarian and deontological. The utilitarian dilemma describes a choice related to causing harm in order to save lives, considered utilitarian morality, whereas the deontological dilemma involves rejecting such harm even if it means not saving lives (Christov-Moore et al., 2017). These types of dilemmas engage different anatomical structures. Deontological dilemma is associated with emotional states, and consequently to the limbic system, while utilitarian dilemma considers the prefrontal area to deal with emotion inhibition (Patil et al., 2021). Another meta-analysis using a similar procedure explored the role of theory of mind (ToM) and empathy in moral decision-making (Bzdok et al., 2012).

Sex differences in moral reasoning have been robustly described in the literature (Atari et al., 2020; Cordellieri et al., 2020; Fumagalli et al., 2010; Harenski & Hamann, 2006). Research indicates that women were less likely than men to accept extreme moral violations, such as killing someone. Additionally, women were more emotionally involved and experienced dysphoric emotions compared to men.

Context also plays a crucial role in moral reasoning. According to Reinders Folmer et al. (2019), moral dilemmas must be considered within the context of interpersonal and intergroup interactions, adhering to specific attributions.

Several studies suggest that morality cannot be fully understood without considering socio-cultural factors (Gehrig et al., 2019; Sorokowski et al., 2020). Consequently, cross-cultural research is a valuable tool in this field. Although some concepts in the literature may be considered universal (Carmona et al., 2015; Fernandes et al., 2018), they can vary according to the norms or values of a society (Gehrig et al., 2019; Sorokowski et al.,

2020). For example, useless harm to a third person is considered morally unacceptable, and attitudes toward a young person's sexual relations may differ across societies based on values related to health, purity, or descent, among other variables.

This study aims to identify sex differences across cultures in acceptability and emotional states to deontological and utilitarian dilemmas. Two countries with culturally distinct crime rates were selected for comparison. According to the UNODC's list of homicide rates, measured in deaths per 100,000 individuals per year by intentional homicide, Brazil ranks 97th and Spain 201st out of 230 countries (UNODC, 2018). It is hypothesized that the acceptability of moral transgressions is influenced by both culture and sex, with men expected to present higher rates of acceptability. Additionally, women are expected to show greater emotional activation than men in both countries. Thus, in order to test these hypotheses, five different scenarios, varying in deontological and utilitarian ethics, will be examined among men and women in Brazil and Spain.

## Method

### Participants

A total of 333 participants from Brazil and 292 participants from Spain volunteered to participate in the study. In Brazil, 46.2 % were men and 53.8 % were women. In Spain, 45.5 % were men and 54.5 % were women. The age mean was 29.97 ( $SD=5.82$ ) in Brazil and 21.15 ( $SD=3.72$ ) in Spain, ranging from 18 to 39 years for both countries. Regarding marital status, 73% were single, 25.2 % were married or living with their partner, 0.3 % were widowed, and 1.5 % were divorced in Brazil. In Spain, 90.4% were single, 9.2 % married or living with their partner, and 0.3% were widowed. In terms of employment, 33.5% of the Brazilian participants were not working, while 59.5% were employed. In Spain, 76.7% were not working, while 14% were employed (6.6% and 9.2% reported a combined situation with studies in Brazil and Spain, respectively).

### Instruments

The questionnaire used was a self-report Likert-type scale, with questions of 4, 5, and 7 points. It was administered via online survey platforms. Participants were invited to read and judge five moral dilemmas involving care-oriented or justice-oriented behavior (Boccia et al., 2017b), and answered related questions without a time limit. The stories were part of an abbreviated adaptation of Manfrinati's moral dilemmas (Lotto et al., 2014; Manfrinati et al., 2013), procedure already adapted in previous literature (Cordellieri et al., 2020).

Each moral dilemma presented a conflicting moral choice between two possible tendencies. The first moral dilemma involved a scenario where the only way to save

their child from a rare type of cancer would be to rob a drugstore and steal the medicine. The choice assesses moral attitudes towards deontological ethics (not stealing) versus a utilitarian perspective (protecting your child's health). The second moral dilemma involved a terrorist group that invaded a church. The participant is hiding with other religious people and a child starts crying. The decision is between suffocating the crying child to avoid detection by terrorists, or doing nothing and running the risk of being discovered and killed. Thus, the participants had to judge a moral decision involving a behavior-oriented towards the utilitarian ethic (ensuring self and community safety) versus the deontological ethic (protecting the child). The third moral dilemma presented an extermination camp scenario, requiring a choice between sacrificing one of their two children or refusing to choose and losing both, assessing deontological behavior (refusing to sacrifice) or a utilitarian perspective (sacrificing one to save the other). The fourth dilemma involved a scenario where the participant with no money to feed their children and the youngest may die from starvation. The only way to feed the starving child is by stealing a supermarket with the risk of being arrested. The choice assesses moral attitudes towards deontological ethics (not stealing) versus the utilitarian perspective (protecting your child). Finally, the fifth dilemma, the participant has Siamese twins at risk of death and must decide whether or not to authorize the death of one to save the other. The choice assesses deontological ethics (refusing to sacrifice) versus the utilitarian perspective (sacrificing one child to save the other).

Each dilemma was followed by four questions that evaluated: (a) moral acceptability of the proposed choice; (b) guilt; (c) responsibility; and (d) consequences. Participants expressed their agreement level on a Likert scale ranging from 0 (completely disagree) to 4 (completely agree). Engagement with each moral dilemma was measured using a three-item scale assessing: (1) involvement, (2) interest, and (3) motivation (1 = not involved at all, not interested at all, not motivated at all; 7 = totally involved, totally interested, totally motivated), as performed in previous literature (Lee & Aaker, 2004; Lee et al., 2010). A composite engagement score was computed by averaging responses across the three items. Additionally, participants answered five questions about their emotional states indicating how angry, sad, happy, disgusted, and fearful they felt on a Likert scale ranging from 1 (not at all) to 5 (very). All original items were translated from Italian to Spanish by a native Spanish speaker fluent in Italian, then back-translated from Spanish to Italian by another bilingual professional. The same procedure was followed for the Portuguese version. In both cases, the translations were reviewed with native speakers to identify and correct any potential mistranslations.

## Procedure

This observational cross-sectional study was conducted in two educational institutions, one in Brazil and the other in Spain. The sampling procedure was incidental, using the "snowball" method, and focused on university students over 18 years old. The research was publicized through social networks. Participants completed a sociodemographic questionnaire and a moral dilemmas questionnaire. The studies adhered to the Declaration of Helsinki and were approved by the University Ethical Committee (UCV/2020-2021/074 and CEP-PUCRS/3.988.845). Participants provided informed consent before participating in the study.

## Data analysis

Statistical analyses were performed using SPSS (IBM SPSS Statistics v. 23). Engagement for each dilemma across countries was analyzed. The reliability of the three-item scale showed optimal values for dilemma one ( $\alpha=.83$  in Brazil and  $\alpha=.75$  in Spain), dilemma two ( $\alpha=.84$  in Brazil and  $\alpha=.78$  in Spain), dilemma three ( $\alpha=.85$  in Brazil and  $\alpha=.83$  in Spain), dilemma four ( $\alpha=.90$  in Brazil and  $\alpha=.80$  in Spain) and dilemma five ( $\alpha=.92$  in Brazil and  $\alpha=.80$  in Spain). ANOVAs were conducted on the scores for (a) moral acceptability of the proposed choice, (b) guilt, (c) responsibility, (d) consequences, (e) engagement, and (f) emotional state (anger, sadness, happiness, disgust, and fear) for each dilemma. The statistical tests were performed based on several assumptions about the data (normal distribution and homogeneity of variances).

## Results

First, engagement levels across a sample of participants were compared. A descriptive analysis was conducted on sex differences across countries, as shown in Table 1. Additionally, a t-test comparison for independent samples was performed. No differences in engagement were found across countries, indicating that further country comparisons could be conducted while controlling this variable.

Secondly, a 2 (sex) x 2 (country) factorial between subject ANOVA was conducted on moral acceptability of the proposed choice, guilt, responsibility, and consequences (see Table 2).

Lastly, a one-way multivariate analysis of variance (MANOVA) was conducted to test the hypothesis that there would be one or more mean differences between emotions across sex and country, as shown in Figure 1. Each analysis is described according to each dilemma.

A statistically significant MANOVA effect was obtained for country and sex across all five dilemmas, however, no interaction between these variables was found.

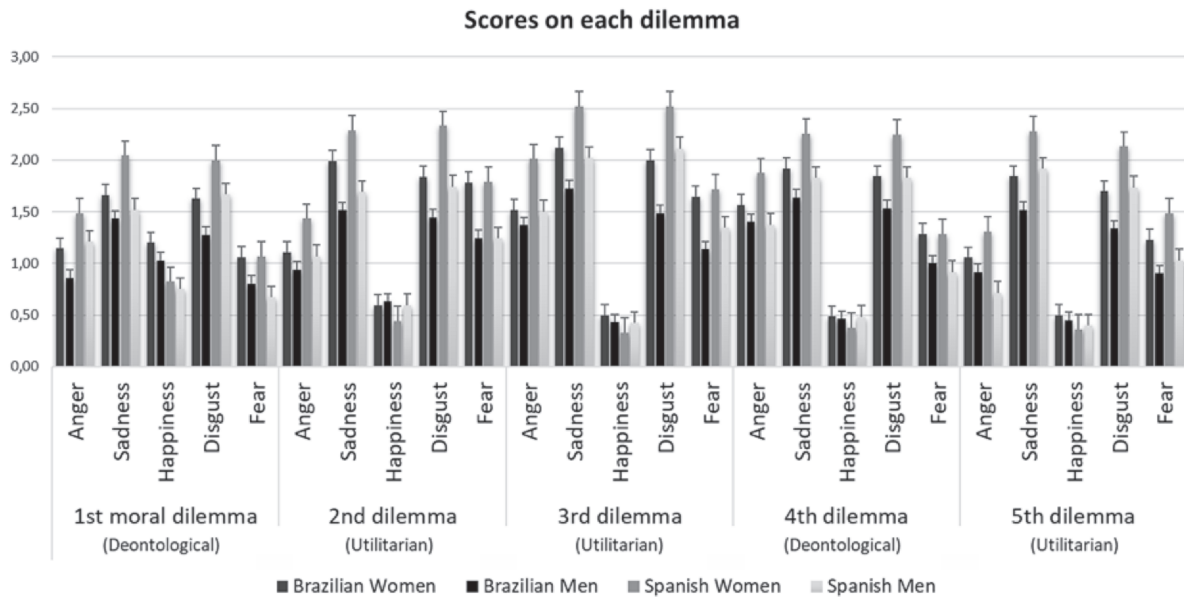
**Table 1**  
Engagement for the five dilemmas across countries

Dilemma	Group	N	Mean	SD	t
1st dilemma	Brazil	333	13.40	4.586	0.24
	Spain	292	12.99	4.163	
2nd dilemma	Brazil	333	13.64	4.579	0.05
	Spain	292	12.94	4.375	
3rd dilemma	Brazil	333	12.97	4.812	0.51
	Spain	292	12.72	4.558	
4th dilemma	Brazil	333	13.61	4.939	0.19
	Spain	292	13.12	4.512	
5th dilemma	Brazil	333	12.67	5.095	0.22
	Spain	292	12.21	4.329	

Notes.  $p < 0.05$ .  $t = t$ -statistic**Table 2**  
Mean and standard deviation on different dimensions of moral judgment across sex in each country

Dilemma	Variable	Brazil		Spain		2x2 Factorial Between Subjects ANOVA		
		Females	Males	Females	Males	Sex ( $p$ ; $\eta^2$ )	Country ( $p$ ; $\eta^2$ )	Interaction ( $p$ )
Deontological 1st moral dilemma	Acceptability	1.34 (1.17)	1.79 (1.35)	2.26 (1.23)	2.19 (1.37)	$p < .001$ ; .06	$p < .05$ ; .1	$p = .05$
	Guilt	1.97 (1.26)	2.25 (1.33)	2.94 (1.16)	2.86 (1.33)	$p = .06$	$p < .001$ ; .08	$p = .32$
	Responsibility	1.40 (1.22)	1.74 (1.41)	2.24 (1.44)	2.33 (1.49)	$p = .27$	$p < .001$ ; .06	$p = .05$
	Consequences	2.39 (1.27)	2.04 (1.31)	2.24 (1.16)	2.36 (1.44)	$p < .05$ ; .008	$p = .41$	$p = .26$
Utilitarian 2nd moral dilemma	Acceptability	1.03 (1.12)	1.5 (1.28)	1.75 (1.24)	1.27 (1.42)	$p < .001$ ; .03	$p < .05$ ; .1	$p = .91$
	Guilt	3.57 (0.71)	3.25 (0.89)	3.57 (0.59)	3.74 (0.76)	$p < .001$ ; .02	$p < .001$ ; .02	$p = .22$
	Responsibility	3.59 (0.74)	3.28 (1.02)	3.67 (0.52)	3.78 (0.61)	$p < .001$ ; .03	$p < .001$ ; .1	$p = .09$
	Consequences	2.51 (1.01)	2.79 (1.11)	2.89 (0.97)	2.50 (1.23)	$p < .001$ ; .02	$p = .59$	$p = .51$
Utilitarian 3rd moral dilemma	Acceptability	1.07 (1.12)	1.25 (1.39)	1.72 (1.32)	1.20 (1.58)	$p < .001$ ; .01	$p < .005$ ; .1	$p = .11$
	Guilt	3.74 (0.53)	3.62 (0.82)	3.68 (0.52)	3.86 (0.75)	$p < .005$ ; .01	$p = .11$	$p = .54$
	Responsibility	3.49 (0.76)	3.24 (1.18)	3.25 (0.89)	3.55 (1.24)	$p < .005$ ; .01	$p = .63$	$p = .77$
	Consequences	2.01 (1.24)	2.27 (1.43)	2.65 (1.39)	2.42 (1.56)	$p < .001$ ; .008	$p < .001$ ; .01	$p = .87$
Deontological 4th moral dilemma	Acceptability	2.01 (1.33)	2.04 (1.49)	2.77 (1.24)	2.69 (1.34)	$p = .56$	$p < .001$ ; 0.6	$p = .86$
	Guilt	2.41 (1.22)	2.35 (1.32)	2.51 (1.33)	2.58 (1.50)	$p = .51$	$p = .13$	$p = .98$
	Responsibility	2.78 (1.22)	2.72 (1.30)	3.40 (0.92)	3.47 (1.03)	$p = .51$	$p < .001$ ; .08	$p = .95$
	Consequences	2.39 (1.17)	2.07 (1.25)	2.23 (1.27)	2.37 (1.33)	$p < .005$ ; .08	$p = .50$	$p = .38$
Utilitarian 5th moral dilemma	Acceptability	1.65 (1.19)	1.72 (1.26)	1.86 (1.30)	1.73 (1.39)	$p = .28$	$p = .326$	$p = .79$
	Guilt	3.13 (0.95)	2.81 (1.17)	3.36 (0.88)	3.49 (1.04)	$p < .005$ ; .01	$p < .001$ ; .04	$p = .22$
	Responsibility	3.09 (1.02)	2.94 (1.18)	3.24 (0.96)	3.47 (1.11)	$p < .005$ ; .08	$p < .001$ ; .02	$p = .65$
	Consequences	2.01 (1.27)	2.12 (1.33)	2.72 (1.23)	2.58 (1.40)	$p = .21$	$p < .001$ ; .04	$p = .89$

**Figure 1**  
Mean score according to each dilemma, country, and sex



In the first moral dilemma (deontological), women reported higher emotional states scores. Spanish participants had higher scores for all emotions, except for happiness (country: Pillais' Trace=.05;  $F_{(5,617)}=7.07$ ;  $p<.001$ ;  $\eta^2=.05$ ; sex: Pillais' Trace=.04;  $F_{(5,617)}=4.66$ ;  $p<.001$ ;  $\eta^2=.04$ ). In the second moral dilemma (utilitarian), women reported higher scores except for happiness. Spanish participants had higher scores for all emotions, except for happiness (country: Pillais' Trace=.03;  $F_{(5,617)}=4.37$ ;  $p<.001$ ;  $\eta^2=.03$ ; sex: Pillais' Trace=.04;  $F_{(5,617)}=6.41$ ;  $p<.001$ ;  $\eta^2=.04$ ). In the third, fourth and five dilemmas, the results were similar: women reported higher scores except for happiness, only in the Spanish group; Spanish participants scored higher for all

emotions, except for happiness. Third dilemma: country: (Pillais' Trace=.05;  $F_{(5,617)}=6.99$ ;  $p<.001$ ;  $\eta^2=.05$ ) and sex (Pillais' Trace=.03;  $F_{(5,617)}=4.73$ ;  $p<.001$ ;  $\eta^2=.03$ ). Fourth dilemma: country (Pillais' Trace=.05;  $F_{(5,617)}=4.31$ ;  $p<.001$ ;  $\eta^2=.03$ ) and sex (Pillais' Trace=.02;  $F_{(5,617)}=3.09$ ;  $p<.001$ ;  $\eta^2=.02$ ). Fifth dilemma: country (Pillais' Trace=.04;  $F_{(5,617)}=5.28$ ;  $p<.001$ ;  $\eta^2=.04$ ) and sex (Pillais' Trace=.03;  $F_{(5,617)}=4.27$ ;  $p<.001$ ;  $\eta^2=.03$ ).

Lastly, a regression model was performed to predict acceptability. Sex and country were included as dummy variables in the analysis. As shown in Table 3, the model that best explained the variance was the second dilemma on the utilitarian manipulation. This also reflected a stronger prediction based on sex and country.

**Table 3**  
Linear regression on the prediction of acceptability for each dilemma

Model	Variable	B	SE	$\beta$	T	p
1st moral deontological dilemma $R^2=.268$	Intercept	0.719	0.218		3.294	0.001
	Guilt	0.354	0.038	0.355	9.404	<.001
	Responsibility	0.177	0.034	0.191	5.154	<.001
	Consequences	-0.096	0.035	-0.093	-2.697	0.007
	Sex	-0.160	0.092	-0.060	-1.733	0.084
	Country	0.272	0.097	0.102	2.791	0.005
	2nd moral utilitarian dilemma $R^2=.314$	Intercept	1.323	0.318		4.159
Guilt		-0.330	0.062	-0.197	-5.343	<.001
Responsibility		-0.095	0.061	-0.057	-1.555	0.121
Consequences		0.516	0.041	0.436	12.681	<.001
Sex		-0.201	0.088	-0.078	-2.286	0.023
Country		0.332	0.088	0.129	3.783	<.001

**Table 3 (continuation)***Linear regression on the prediction of acceptability for each dilemma*

Model	Variable	B	SE	$\beta$	T	p
3rd moral utilitarian dilemma R <sup>2</sup> =.251	Intercept	1.423	0.341		4.168	<.001
	Guilt	-0.117	0.080	-0.057	-1.459	0.145
	Responsibility	-0.173	0.052	-0.130	-3.332	<.001
	Consequences	0.412	0.035	0.426	11.909	<.001
	Sex	-0.178	0.097	-0.065	-1.839	0.066
	Country	0.143	0.097	0.052	1.482	0.139
4th moral deontological dilemma R <sup>2</sup> =.189	Intercept	0.797	0.254		3.136	0.002
	Guilt	0.169	0.041	0.162	4.159	<.001
	Responsibility	0.281	0.048	0.238	5.879	<.001
	Consequences	-0.168	0.041	-0.151	-4.149	<.001
	Sex	-0.047	0.102	-0.017	-0.458	0.647
	Country	0.500	0.106	0.178	4.710	<.001
5th moral utilitarian dilemma R <sup>2</sup> =.30	Intercept	2.220	0.229		9.714	<.001
	Guilt	-0.340	0.052	-0.276	-6.600	<.001
	Responsibility	-0.146	0.049	-0.123	-3.004	0.003
	Consequences	0.362	0.034	0.377	10.777	<.001
	Sex	0.055	0.087	0.021	0.634	0.526
	Country	0.095	0.092	0.037	1.033	0.302

Notes. R<sup>2</sup>=determination coefficient; B=unstandardized coefficient; SE=standard error;  $\beta$ =standardized coefficient; t=t-statistic; p=probability

## Discussion

Morality is a fundamental aspect of human nature, involving emotional and cognitive aspects and guiding numerous behaviors in society. Although some authors consider certain moral concepts as universal (Carmona et al., 2015; Fernandes et al., 2018; Snarey, 1985), these concepts cannot be fully understood without considering socio-cultural factors, as they can vary according to the norms or values of a society (Gehrig et al., 2019; Sorokowski et al., 2020).

Several studies have identified sex differences in moral choices, particularly when manipulated in terms of utilitarian and deontological choices. Men have been described as more willing to engage in utilitarian transgressions to optimize outcome, while women are more associated with deontological decisions that involve emotional components (Cordellieri et al., 2020; Fumagalli et al., 2010; Harenski & Hamann, 2006). Research has also shown that these sex differences vary across cultures (Atari et al., 2020; Gawronski & Ng, 2024). Thus, cross-cultural research can highlight differences across sex in solving moral dilemmas in different countries.

This study aimed to identify differences in acceptability and emotional states in solving deontological and utilitarian dilemmas across sex and countries, comparing Brazil and Spain. Thus, five scenarios were presented, each differing in deontological or utilitarian perspectives.

The main results are: 1. differences between sex and country were found however without interactions across these two variables; 2. men scored higher than women in acceptability; 3. women scored higher than men in emotional states; 4. Spanish subsample scored higher in both variables; 5. sex predicted acceptability exclusively for the second dilemma concerning utilitarian ethic.

Our findings suggest that moral transgressions are more acceptable to Spanish than Brazilian people; also indicate that men are more prone than women to accept moral transgressions and less sensitive to it. This corroborates with the literature, which robustly shows sex role differences in accepting moral dilemmas that cause harm. Despite advances in women's rights, social roles are still strongly affected by sex differences. This may explain sex differences observed in moral judgment related to variables such as guilt, consequences, and responsibility, despite the small effect size in the analyzed samples.

Atari et al. (2020) conducted a study to explore and identify whether sex differences in morality vary across cultures, using a sample from 67 countries. They analyzed these differences through the framework of Moral Foundations Theory (i.e. Care, Fairness, Loyalty, Authority, and Purity). They also investigate the relationship between country-level indices of cultural characteristics, socioeconomic development, and gender equality related to the magnitude of sex differences in moral

judgments. Their findings revealed that women scored higher than men on Care, Fairness, and Purity, indicating consistent and robust sex differences in these moral domains across cultures. In contrast, sex differences in Loyalty and Authority varied considerably across cultures. They also noted that global sex differences in moral judgments were more pronounced in cultures characterized by individualism and gender equality.

Bentahila et al. (2021), in a review, investigate moral theories that aim to explain how cultural factors influence moral judgment and reasoning. In their conclusions, morality encompasses shared values, implicit rules, principles, and cultural customs, acquired over time during individual development. These principles are influenced by cultural norms that regulate emotions to maintain social order.

This cultural influence may explain the differences observed in acceptability and emotional states between the Brazilian and Spanish subsamples in our study. Despite the results do not explain a reason for higher scores in the Spanish subsample, some cultural aspects transmitted across generations evolve slowly in society. Brazil, relatively younger in socio-historical development compared to Spain, may exhibit distinct historical and sociocultural dynamics worthy of further investigation in future studies.

It is important to consider that our findings could be influenced by interpretative ambiguity associated with using unidimensional measures that are not considered independent (Ludwig et al., 2020). Unsurprisingly, no fixed pattern has been described between the different natures of the dilemmas. However, in the regression analysis, acceptability was predicted for the second dilemma of a utilitarian nature. The country variable predicted more dilemmas than sex, suggesting the complexity of social norms, culture, and society.

Potential biases might have arisen due to the self-administered nature of the questionnaires and the use of non-probabilistic sampling methods, which limit the

generalizability of our results. Additionally, our study did not delve into individual differences within the studied groups.

According to Gawronski & Ng (2024), despite the widespread use of moral dilemmas in cross-cultural studies involving participants from various countries, studies that directly investigated cultural differences in moral-dilemma responses are scarce. Furthermore, as reported by Atari et al. (2020), most research on sex and cultural differences in morality has been based on within-culture or small-scale cross-cultural data. Therefore, future research is encouraged to replicate and extend the present findings using more representative sampling procedures across diverse cultural contexts.

### Acknowledgments

There are no mentions.

### Funding

This work was supported by the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) e Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES).

### Authors' contributions

We declare that all authors participated in the preparation of the manuscript.

### Availability of data and materials

All data and syntax generated and analyzed during this research will be treated with complete confidentiality due to the Ethics Committee for Research in Human Beings requirements. However, the dataset and syntax that support the conclusions of this article are available upon reasonable request to the principal author of the study.

### Competing interests

The authors declare that there are no conflicts of interest.

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recebido em outubro de 2022  
aprovado em agosto de 2024

## Sobre os autores

**Aline Ponzoni** has a Master's degree in Clinical Psychology from the Pontifical Catholic University of Rio Grande do Sul, Brazil.

**Irani Iracema de Lima Argimon** is PhD, professor and researcher at the AICV (Life Cycle Assessment and Intervention) laboratory at the Pontifical Catholic University of Rio Grande do Sul, Brazil.

**María del Carmen Moret-Tatay** is PhD, professor and researcher at the MEB laboratory (Mind, Emotion and Behavioral research laboratory) at the Universidad Católica de Valencia San Vicente Mártir, València and at the Neuroscienze Salute Mentale e Organi di Senso (NESMOS), and at Sapienza University of Rome, Italy.

**Anna Maria Giannini** is PhD, professor and researcher at the Department of Psychology at Sapienza University of Rome, Italy.

**Pierluigi Cordellieri** is PhD, professor and researcher at the Department of Psychology at Sapienza University of Rome, Italy.

## Como citar este artigo

Ponzoni, A., Argimon, I. I. L., Moret-Tatay, M. C., Giannini, A. M., & Cordellieri, P. (2023). Acceptability and emotional states in moral dilemmas across sex: a cross-cultural analysis. *Avaliação Psicológica*, 22(4), 359-366. <http://dx.doi.org/10.15689/ap.2023.2204.25062.05>