

Exploring cultural and gender differences in moral judgment: A cross-cultural study based on the CNI model

Yachun Qian¹ · Yoshiyuki Takimoto² · Lu Wang³ · Akira Yasumura⁴

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Abstract

Recently, researchers have proposed a polynomial model called the "consequences, norms, generalized inaction" (CNI) model for researching moral judgment. However, it is unclear whether the model can be used to explore cultural differences in moral judgment. In this study, we investigated the applicability of the CNI model of moral judgment to East Asian groups, and subsequently explored cultural and gender differences in moral judgment between East Asian (i.e., Japan, n = 211; China, n = 200) and Western (i.e., USA, n = 201) groups. The CNI model was proposed by Gawronski et al., and it can quantify individuals' sensitivity to moral consequence, sensitivity to moral norms, and their general preference for inaction or action in moral dilemmas. Our results indicate that the CNI model fits well for Japanese and Chinese individuals. Both East Asian women and Western women were significantly more sensitive to moral norms than men in their respective countries. In the international comparison, Westerners were more sensitive to moral norms. The Japanese groups, for both men and women, were most biased towards inaction. Regarding sensitivity towards consequences, no differences were observed in the comparison between Eastern and Western male groups, whereas poor sensitivity was observed among women. By using this new model, this study provides new insights into the differences of cultural and gender in moral judgment.

 $\textbf{Keywords} \hspace{0.2cm} \textbf{Moral judgment} \cdot \textbf{CNI} \hspace{0.2cm} \textbf{model} \cdot \textbf{Cross-cultural} \cdot \textbf{Gender difference}$

Introduction

With the COVID-19 pandemic afflicting the world, the issue of ethical dilemmas is once again highly debated, for example, people's attitudes toward compulsory vaccines or the ethical decisions doctors sometimes make about which patients should be admitted to intensive care units when medical resources are scarce (Carron et al., 2022; Shortland et al., 2020). As these moral dilemmas can occur globally,

Akira Yasumura yasumura@kumamoto-u.ac.jp

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- Graduate School of Social and Cultural Sciences, Kumamoto University, Kumamoto, Japan
- Department of Biomedical Ethics, Faculty of Medicine, The University of Tokyo, Tokyo, Japan
- ³ Guizhou University of Finance and Economics, Guiyang, China
- Graduate School of Humanities and Social Sciences, Kumamoto University, 2-40-1 Kurokami Chuo-Ku, Kumamoto 860-8555, Japan

understanding how people across different cultures make moral judgments while facing the same moral dilemma is crucial. Individuals across different countries or cultures may make different moral judgments even when faced with the same moral dilemma, possibly owing to their varying cultural belief systems (Winskel & Bhatt, 2020).

Research on moral judgment has been dominated by sacrificial dilemmas, where sacrificing the life of another person is necessary to save several lives. In these dilemmas, it is widely considered utilitarian judgments to sacrifice one person to save many based on the principle of the greatest happiness of the greatest number, while the opposite is considered deontological judgments that emphasizes morality in the process (Kahane, 2015). To understand the processes underlying moral judgment, Greene et al. (2001) proposed a dual process model, which suggests that there are two systems in moral cognition, where people's processing of some moral issues includes a greater degree of emotional factors, whereas the processing of other issues includes more cognitive processing factors. According to the dual processing theory, in the trolley problem, most people would agree

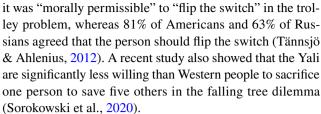


to change the direction of the track to save more lives by sacrificing one person, with this utilitarian choice primarily resulting from cognitive processing. By contrast, in the flyover dilemma, most people would refuse to save more lives by pushing a stranger off the overpass, with this deontological choice primarily resulting from emotional activation (Greene et al., 2001; Greene, 2009). Few cross-cultural studies supporting the dual process model suggest its reliability across cultures (Duan et al., 2012; Moore et al., 2011).

However, utilitarianism and deontology are strictly opposed and incompatible in the dual process model; the stronger the tendency of utilitarianism, the weaker the tendency of deontology, and vice versa. Additionally, existing studies have been unable to quantify the difference in the degree to which policymakers respond to utilitarianism versus deontology (Conway & Gawronski, 2013). Recently, researchers have proposed a polynomial model called the "consequences, norms, generalized inaction" (CNI) model for researching moral judgment, which is not hindered by the limitations of the dual process model (Gawronski et al., 2017, 2018). The CNI model is a multi-indicator model that quantifies people's sensitivity to consequences (i.e., the extent to which people's responses are influenced by consequences for the greater good; the C parameter), sensitivity to ethical norms (i.e., the extent to which people's responses are influenced by moral norms; the N parameter) and general preference for inaction versus action (i.e., the extent to which people show a general preference for inaction versus action; the I parameter) in response to ethical dilemmas (Luke & Gawronski, 2022). However, whether the model can explore cultural differences in moral judgment is yet to be clarified. This study aims to explore the differences in moral judgment between Eastern and Western groups using the CNI model.

Moral judgment across cultures

Moral judgment can be significantly influenced by cultural differences. The existence of these cultural differences has been demonstrated through a number of studies that do not use the CNI model. For example, a large-scale study across 67 countries noted that gender differences in moral judgment conceptualized in moral grounded theory (caring, fairness, loyalty, authority, and purity) differed across cultures (Atari et al., 2020). In another study involving 70,000 participants responding to three sacrificial dilemmas from 10 languages and 42 countries, all three moral dilemmas were found to exhibit the same level of sacrificial acceptance in each country. This suggests that this order can be explained in terms of underlying cognitive processes rather than cultural norms. However, the quantitative acceptability of each sacrifice varies considerably across countries and cultures (Awad et al., 2020). Furthermore, only 52% of Chinese people agreed that



Cultures are commonly compared based on the relative degrees of individualism and collectivism (Germani et al., 2021; Lykes & Kemmelmeier, 2014). When focusing on Eastern groups versus Western groups, we find that Eastern collectivism emphasizes the importance of social responsibility, interdependence, and social harmony, whereas Western individualism tends to emphasize autonomy and independence (Lim, 2016; Shin et al., 2020). Previous research has shown that individuals from collectivist societies are often less utilitarian when responding to hypothetical moral dilemmas than those from individualistic backgrounds. For example, Chinese participants who studied in the UK were not only less likely to take action and choose to sacrifice one life to save five, but were also less likely to consider such action appropriate compared with participants from the UK (Gold et al., 2014). Hence, our first hypothesis is that in the CNI model, Western groups are more sensitive to consequences than Eastern groups. Moreover, as Oriental cultures are generally considered conservative (Tang & Tang, 2015), people in collectivistic cultures are likely to conceive of groups as agents more so than individuals, and Easterners do not expect individuals to act. Therefore, a negative outcome that occurs when an individual (versus group) does act should generate a relatively high degree of regret (Ng et al., 2015). Therefore, we hypothesize that in the CNI model, Eastern groups are more inclined to inaction than Western groups.

The CNI model

The CNI model operationalizes utilitarian tendencies as sensitivity to consequences and deontological tendencies as sensitivity to norms, and further separates general preference for inaction versus action irrespective of consequences and norms, covering four combinations of norms (prohibited or promoted) and outcomes (more good than bad or more bad than good) in terms of context types. Specifically, the three parameters C, N, and I of the CNI model correspond to the likelihood that behavioral choices are driven by outcomes, ethical norms, and behavioral response preferences respectively, and the four paths of the model describe four situations of behavioral choices. When behavioral choices are driven by outcomes, in line with the utilitarian response model, the situation is described by path C, which represents a situation where behavioral choices are driven by outcomes



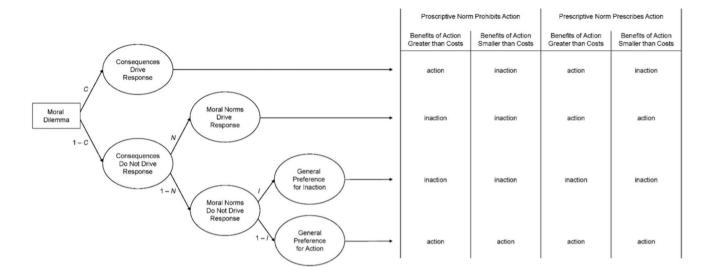


Fig. 1 CNI model of moral decision-making predicting action versus inaction responses in moral dilemmas with proscriptive and prescriptive norms and consequences involving benefits of action that are

either greater or smaller than costs of action. Reproduced from Gawronski et al. (2017). Reprinted with permission from the American Psychological Association

(Fig. 1; row 1). When behavioral choices are driven by moral norms, it is consistent with the deontological response model, which is described by path $(1-C)\times N$, representing a situation where moral norms drive behavioral choices when outcomes do not (Fig. 1; row 2). When behavioral choices reflect an individual's preference for inaction, it is consistent with the inaction response model, which is described by path $(1-C)\times (1-N)\times I$, representing an individual's preference for inaction when outcome and moral norms do not drive behavioral choices (Fig. 1; row 3). When behavioral choices reflect an individual's preference for acting, it is consistent with the action response model, which is described by path $(1-C)\times (1-N)\times (1-I)$, representing an individual's preference for action when outcomes and moral norms do not drive behavioral choices (Gawronski et al., 2017, 2018).

The dilemmas of the CNI model included four parallel versions of six basic scenarios (i.e., abduction, transplant, torture, assisted suicide, immune deficiency, and vaccine dilemma) that varied in terms of whether (a) the dilemma involved a prescriptive norm that prohibited action or one that prescribed action, and (b) the benefits of the described action for overall well-being were greater or smaller than the costs for overall well-being (Gawronski et al., 2017) (Table 1).

As the CNI model overcomes the shortcomings of the dual-process model, it enables researchers to investigate issues pertaining to moral judgment from a new perspective. It has been applied in many studies, for example, on psychopathic traits (Li et al., 2020), internet addiction (Lu et al., 2022), decision-making time (Kroneisen & Steghaus, 2021), language use (Białek et al., 2019), and motivational differences (Cornwell & Bella, 2022). The CNI model is more suitable for inter-population comparisons (Gawronski

et al., 2017), and a recent study has developed an extended dilemma battery that enables the CNI model to research individual differences in moral dilemma judgments (Körner et al., 2020).

Interestingly, when discussing gender differences using the CNI model, Gawronski et al. (2017) found that Western women were more sensitive to moral norms and preferred inaction than men; however, there were no gender differences in sensitivity to consequences, implying that while Western women held more moral positions than men, they were also undiminished in their utilitarian stance. This is at odds with the conclusions of conventional research (Gawronski et al., 2017). Previous research has shown that men are more utilitarian than women (Bartels & Pizarro, 2011), and that men more often make "pragmatic" choices without regard to the risk of putting others at risk or harm (Fumagalli et al., 2010). These findings suggest that using the CNI model helps explore issues in moral judgment from a new viewpoint. However, the material on moral dilemmas in the model was developed in a Western cultural context, and it is worth exploring further whether it can be used in research with groups from other cultural contexts and whether the gender differences exist in other cultural contexts.

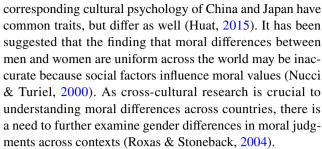
The current study

The aforementioned studies using the CNI model to explore gender differences did not include Oriental cultures. Eastern culture usually refers to the cultures of East Asian countries such as Korea, Japan, and China. China and Japan coexist in East Asian culture, and at the surface level, the cultures and



Table 1 Example of a moral dilemma involving either a proscriptive or a prescriptive norm where the benefits of action are either greater or smaller than the costs of action. Reproduced from

Proscriptive Norm Prohibits Action		Proscriptive Norm Prescribes Action	
Benefits of Action Greater than Costs	Benefits of Action Smaller than Costs	Benefits of Action Greater than Costs	Benefits of Action Smaller than Costs
You are the president of your country. A guerilla group operating in a conflict zone has abducted a journalist from your country and threatens to behead him if your government does not pay a ransom of one million dollars. The group will use the ransom money to buy weapons for their guerilla war, which will cause the deaths of many people. Congress has approved payment of the ransom, but you have the power to veto the payment.	You are the president of your country. A guerilla group operating in a conflict zone has abducted a journalist from your country and threatens to behead him if your government does not pay a ransom of one million dollars. The group will use the ransom money to buy food for their famillies, who live in the area that has been plagued by several droughts. Congress has approved payment of the ransom, but you have the power to veto the payment. Would you veto the ransom	You are the president of your country. A guerilla group operating in a conflict zone has abducted a journalist from your country and threatens to behead him if your government does not pay a ransom of one million dollars. The group will use the ransom money to buy food for their famillies, who live in an area thath has been plagued by several droughts. As the president, you have the power to approve payment of the ransom. Would you approve the ransom payment in this case?	You are the president of your country. A guerilla group operating in a conflict zone has abducted a journalist from your country and threatens to behead him if your government does not pay a ransom of one million dollars. The group will use the ransom money to buy weapons for their guerilla war, which will cause the deaths of many people. As the president, you have the power to approve payment of the ransom. Would you approve the ransom payment in this case?



The first aim of this study was to examine the applicability of the CNI model in the East Asian (i.e., Japan, China) context and the use of the model to discuss gender differences among these two groups. Subsequently, we conducted the first comparative study of Eastern and Western groups using the CNI model, aiming to examine cultural differences in moral judgment. Data for Western groups were obtained from Gawronski et al. As the study did not collect new data in 2022, we used data that were collected in 2017 (Gawronski et al., 2017).

Method

Participants

Following a power analysis based on Gawronski et al. (2017), a target of 200–350 and 200–350 Japanese and Chinese participants, respectively, was set for this study.

In this study, a total of 344 Japanese participants, whose native language was Japanese, were recruited in June 2022 through the Questant data platform from various regions of the country. After excluding data from those who did not complete all measures and did not pass the manipulation check, a total of 211 valid responses (80 men; 131 women) were collected, with a mean age of 32.16 years (SD = 5.31).

A total of 291 Chinese participants, whose native language was Chinese, were recruited in May 2022 through the University of Finance and Economics in Guizhou Province, with participants from all regions of China. After excluding data from those who did not complete all measures and did not pass the manipulation check, a total of 200 valid responses (80 men; 120 women) were collected, with a mean age of 28.98 (SD=6.99).

The original English sample was data from a publicly available study conducted by Gawronski et al. in 2017. Participants were recruited for a study on "how people make moral judgments" via Amazon's MTurk. Eligibility for participation was limited to English native speakers. Participants received compensation of \$1.00 for completing the study. Of the 228 MTurk workers who initially began the study, 206 completed all measures. Of these participants, 5 failed to pass an instructional attention check. Data from



these participants were excluded from the statistical analyses, leaving us with a final sample of 201 participants (95 women; 106 men) and a mean age of 32.2 years (SD = 10.96) (Gawronski et al., 2017).

Procedure and materials

The participants of this study completed a battery of 24 moral dilemma tests for research using the CNI model (Gawronski et al., 2017). The content and structure of the Japanese and Chinese versions of the CNI model were the same as those of the English version.

All participants agreed to participate after receiving written and oral explanations of the purpose of the study. Participants took the test online and had not taken a similar moral judgment test before participating in the study. After registering demographic variables such as gender, age, marital status, and education, they were asked to answer whether the 24 ethical dilemmas were acceptable (the order of presentation was consistent with Gawronski et al.'s (2017) study). Finally, after responding to the dilemmas, the participants completed a manipulation check (The lure question is "Which of these activities do you engage in regularly?" along with sports response options. However, contained within a large block of instructions was a sentence that informed participants to ignore the sports options and instead write "I read the instructions" in the box marked "other.") (Hauser & Schwarz, 2016; Oppenheimer et al., 2009).

CNI model analysis results

The CNI model was applied using the multiTree software (Moshagen, 2010). We processed and coded the raw data to calculate the total number of acts and omissions for each ethical dilemma, which were then entered into the CNI multiTree analysis software (Gawronski et al., 2018).

The goodness of fit of the collected data to the CNI model was analyzed using multiTree software, without

considering the participants' gender. The results for the Japanese groups indicated that the CNI model could fit the Japanese moral judgment data well, and that the CNI model could be used as a research tool for the Japanese groups $[G^2(2) = 4.76, p = 0.093]$. Both the C and N parameters were significantly greater than the baseline scores of 0. The C parameter's ΔG^2 (1) = 128.854, p < 0.001 and the N parameter's ΔG^2 (1) = 115.229, p < 0.001 indicated that Japanese participants' sensitivity to results and moral norms significantly influenced the judgment process of moral dilemmas. Furthermore, The I parameter significantly deviated from its neutral reference point of 0.5 [ΔG^2 (1) = 121.332, p < 0.001], indicating that Japanese participants tended to choose inaction over action. Similarly, the results showed that the CNI model can also fit the moral judgment data of Chinese groups, and that CNI model can be used as a research tool to study Chinese $[G^2(2) = 0.639, p = 0.726]$. Both the C and N parameters were significantly greater than the baseline scores of 0. The C parameter's ΔG^2 (1) = 158.79, p < 0.001, and the N parameter's ΔG^2 (1) = 107.48, p < 0.001 indicated that Chinese people's sensitivity to results and moral norms significantly affected the judgment process of moral dilemmas. The I parameter significantly deviated from its neutral reference point of 0.5 [ΔG^2 (1) = 7.658, p < 0.001], suggesting that the Chinese participants tended to choose inaction over action (Table 2).

Gender differences in Japanese groups

The CNI model fit the data well among Japanese men and women [G^2 (2)=2.391, p=0.302]. Moreover, women scored significantly higher than men on the N parameter [ΔG^2 (1)=18.506, p<0.01], indicating that Japanese women are significantly more sensitive to moral norms than men. However, there was no significant difference between Japanese men and women on the C [ΔG^2 (1)=0.586, p=0.443] and I [ΔG^2 (1)=1.984, p=0.158] parameters (Fig. 2).

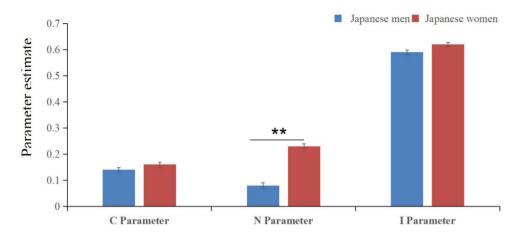
Table 2 Mean estimates and 95% confidence intervals for the parameters of the CNI model for men and women in Japanese, Chinese and Western contexts

Variable	Japanese		Chineses		Western	
	men	women	men	women	men	women
	M	95%CI	M	95%CI	M	95%CI
C Parameter	0.14 [0.10–0.18]	0.16 [0.13–0.20]	0.18 [0.14–0.23]	0.17 [0.14–0.21]	0.18 [0.15–0.22]	0.22 [0.18–0.26]
N Parameter	0.08 [0.04-0.14]	0.23 [0.19-0.27]	0.05 [0.00-0.11]	0.25 [0.21-0.30]	0.15 [0.10-0.19]	0.33 [0.28-0.38]
I Parameter	0.59 [0.56–0.62]	0.62 [0.59–0.64]	0.48 [0.46–0.51]	0.56 [0.53-0.59]	0.48 [0.45–0.51]	0.56 [0.52–0.60]

These parameters reflect sensitivity to consequences (C), sensitivity to ethical norms (N), and a general preference for inaction without regard to consequences and norms (I)



Fig. 2 Estimates of three parameters for Japanese cohort men and women: sensitivity to consequences (C), sensitivity to norms (N), and a general preference for inaction versus action (I). Error bars reflect 95% confidence intervals. **:p < .01



Gender differences in Chinese groups

The CNI model also fit the data well for Chinese men and women $[G^2(2)=1.156,p=0.56]$. Women scored significantly higher than men on the N parameter $[\Delta G^2(1)=34.0,p<0.01]$, indicating that Chinese women are significantly more sensitive to moral norms than men. On the I parameter as well, women scored significantly higher than men $[\Delta G^2(1)=15.87,p<0.01]$, indicating that Chinese women have a stronger tendency for inaction. However, there was no significant difference between Chinese men and women on the C parameter $[\Delta G^2(1)=0.091,p=0.76]$ (Fig. 3).

Pairwise comparisons between Japanese, Chinese and Western groups

For Japanese groups vs. Chinese groups: there were no differences between Japanese and Chinese men on the C [ΔG^2 (1)=2.543, p=0.467] and N [ΔG^2 (1)=1.725, p=0.631] parameters. However, for the I parameter, scores of Japanese men were significantly higher than that of Chinese men

 $[\Delta G^2\ (1) = 28.648,\ p < 0.01]$, indicating that Japanese men have a stronger tendency to prefer inaction. There were no differences between Japanese and Chinese women on the C $[\Delta G^2\ (1) = 0.166,\ p = 0.683]$ and N $[\Delta G^2\ (1) = 0.883,\ p = 0.347]$ parameters. However, for the I parameter, scores of Japanese women were significantly higher than that of Chinese women $[\Delta G^2\ (1) = 7.26,\ p < 0.01]$, indicating that Japanese women have a stronger tendency to prefer inaction.

For Japanese groups vs. Western groups: there were no differences between Japanese and Western men on the C [ΔG^2 (1)=2.395, p=0.122] and N [ΔG^2 (1)=3.059, p=0.080] parameters; however, for the I parameter, the scores of Japanese men were significantly higher than Western men [ΔG^2 (1)=31.398, p<0.01], indicating that Japanese men have a stronger tendency to prefer inaction. A significant difference was found on the C parameter [ΔG^2 (1)=4.649, p<0.05] between Japanese and Western women, indicating that the latter are significantly more sensitive to the results than the former. Furthermore, a significant difference was noted on the N parameter [ΔG^2 (1)=8.849, p<0.01], indicating that Western women are significantly more

Fig. 3 Estimates of three parameters for Chinese cohort men and women: sensitivity to consequences (C), sensitivity to norms (N), and a general preference for inaction versus action (I). Error bars reflect 95% confidence intervals.**:p<.01

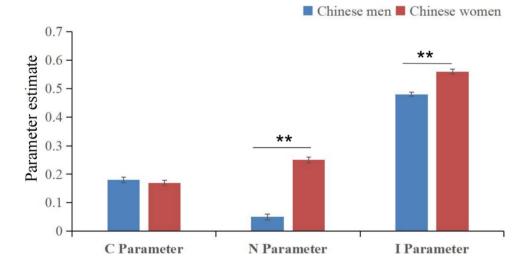
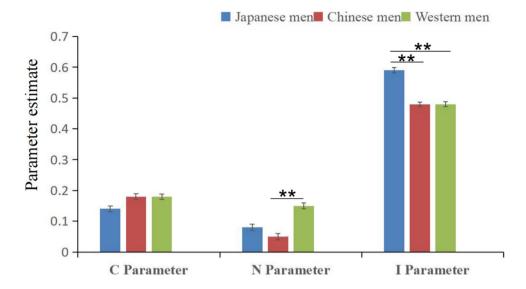




Fig. 4 Estimates of three parameters for men in three countries: sensitivity to consequences (C), sensitivity to norms (N), and a general preference for inaction versus action (I). Error bars reflect 95% confidence intervals. **:p < .01



sensitive to moral norms than Japanese women. Additionally, Japanese women scored significantly higher than Western women on the I parameter [ΔG^2 (1) = 6.447, p < 0.05], indicating that Japanese women prefer inaction.

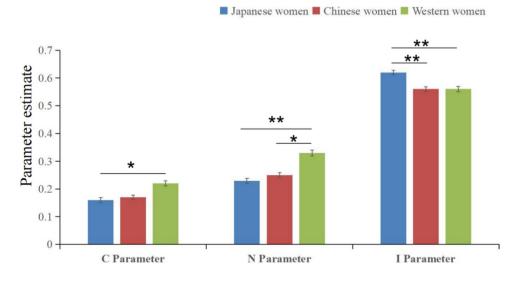
For Chinese groups vs. Western groups: no differences were noted on the C parameter $[\Delta G^2 \ (1) = 0.339, p = 0.853]$ between Chinese men and Western men. It was found that Western men scored significantly higher than Chinese men on the N parameter $[\Delta G^2 \ (1) = 0.901, p < 0.01]$, indicating that Western men are significantly more sensitive to moral norms than Chinese men; there were no differences between Chinese and Western men on the I parameter $[\Delta G^2 \ (1) = 0.057, p = 0.81]$. Moreover, no differences were noted for the C parameter $[\Delta G^2 \ (1) = 3.006, p = 0.08]$ between Chinese and Western women. It was found that Western women scored significantly higher than Chinese women on the N parameter $[\Delta G^2 \ (1) = 4.261,$

p < 0.05], indicating that Western women are significantly more sensitive to moral norms than Chinese women; there were no differences between Chinese and Western women on the I parameter $[\Delta G^2]$ (1) = 0.042, p = 0.835]. (Figs. 4 and 5).

Discussion

This study is the first cross-cultural comparison of moral judgment between Eastern and Western groups using the CNI model. The aims of the current study were twofold: first, this study examines the applicability of the CNI model in the East Asian (i.e., Japan, China) context and the use of the model to discuss gender differences among these two groups; second, the study also aimed to explore gender and cultural differences in moral judgments between East Asian and Western groups.

Fig. 5 Estimates of three parameters for women in three countries: sensitivity to consequences (C), sensitivity to norms (N), and a general preference for inaction versus action (I). Error bars reflect 95% confidence intervals. *:p < .05.**:p < .01

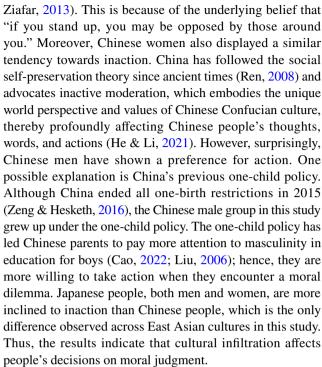




In both the Japanese and Chinese contexts, gender differences emerged in sensitivity to moral norms: women were more sensitive to moral norms than men; however, no differences were found regarding sensitivity to consequences in either case. This demonstrates the similarity of East Asian cultures in terms of moral judgment. Moreover, our results did not support prior studies that showed that men are more utilitarian than women (Fumagalli et al., 2010). Furthermore, combining Gawronski et al.'s (2017) data, we found that both East Asian and Western women are significantly more sensitive to moral norms than men in their respective countries, indicating that women are more sensitive to moral norms irrespective of their cultural background. A pilot study using process dissociation to assess utilitarian and deontological reaction tendencies also showed that women scored higher on moral tendencies than men (Armstrong et al., 2019). Furthermore, a prior study that also used the CNI model showed that higher endogenous testosterone levels influencing moral judgments were associated with lower moral norm sensitivity (Brannon et al., 2019). Therefore, higher testosterone levels in men may be a reason they are less sensitive to moral norms than women. Furthermore, from a neurological viewpoint, which could also explain increased insular activity in women, that is, greater moral sensitivity in women, and greater neural activity related to empathy (Harenski et al., 2008). Thus, our study's conclusions on Japanese and Chinese women's sensitivity to moral norms are consistent with those about Western women.

In this study, we also found some cultural differences. First, Westerners, regardless of gender, are more sensitive to moral norms than Easterners, which contrasts our hypothesis. In traditional cognition, East Asians, especially the Chinese and Japanese, are influenced by Confucianism and pay great attention to etiquette norms (Wei & Li, 2013; Young, 2009). However, etiquette norms differ from moral norms (O'Neill, 2017). The results of the current study show that Westerners are more sensitive to moral norms, which may be related to the fact that they hold an independent self-construction outlook that emphasizes individual needs, responsibilities, and attributes (Rothbaum et al., 2000); moreover, the pursuit of individual needs motivates their pursuit of a stable society, and moral norms are closely related to maintaining social stability (Hawkins et al., 2019).

In addition, the Japanese groups, regardless of gender, had a significant preference for inaction, which is a prominent manifestation of cultural differences. Usually, Asians are considered to be passive and implicit, stemming from the traditional cultural attributes of Asian societies (Cheng, 2000). For example, Japanese people are considered poor at expressing their ideas and tend to be more conservative (Petkova, 2015). The Japanese population is majorly characterized by shyness and quietness (Maftoon &



Interestingly, when comparing the sensitivity to consequences on the C parameter, no differences were found between the Eastern and Western groups of men, whereas women showed significant differences. Western women were more sensitive to consequences than Japanese women. We speculate that this is because Western female groups are influenced by feminism in their culture and have utilitarian tendencies. Regarding the N parameter's comparisons of sensitivity to moral norms, only the Western and Chinese data showed differences among men, whereas significant differences were noted in the data of all three countries among women; we observed more cultural differences among women. This is supported by the claim that differences in the utility of moral judgments between cultures more often apply only to one gender, although in a previous study, cultural differences were noted only among men (Arutyunova et al., 2016). Our findings suggest that cultural differences may affect women more than men in terms of moral judgments. This result may be because of our use of the CNI model, which overcomes the limitations of the binary opposition between traditional utilitarianism and deontology (Li et al., 2020).

Implications

In recent years, multifaceted psychological measures of morality have opened the door to the study of cross-cultural similarities and differences in moral judgments (Graham et al., 2009). For this study, we used a new tool to study moral judgment — the CNI model, and demonstrated its applicability to East Asian populations. Our findings suggest



that data from Japan and China fit this new model proposed by Western researchers. The results validate the value of the CNI model in Japanese and Chinese cultures. Additionally, the results support the universality thesis, illustrating that the process by which people make moral judgments is largely consistent, although influenced by factors such as culture. We obtained systematic relations between three parameters of the CNI model, which provides new insights into the differences of cultural and gender in moral judgment. Our results indicate that Both East Asian women and Western women were significantly more sensitive to moral norms than men in their respective countries. In the international comparison, Westerners were more sensitive to moral norms. The Japanese group, for both men and women, were most biased towards inaction. With regard to sensitivity towards consequences, no differences were observed in the comparison between Eastern and Western male groups, while poor sensitivity was observed among women. We believe that the results of this study will aid existing literature involving the theoretical advancement and internationalization of research tools for moral judgment.

Limitations and future research

Although this study provides new perspectives on the cultural and gender differences between Eastern and Western groups, it does have few limitations. First, the sample size is not sufficiently large. We only discussed Japanese and Chinese groups, and East Asian culture also includes Korean culture, Mongolian culture, and so on. Therefore, our data are not entirely representative of East Asian groups. In addition, it should be noted that the data used for the Eastern groups in this study were collected in 2022, after the outbreak of the COVID-19 pandemic. However, the data used for the Western groups were collected in 2017, which is not recent. Following the COVID-19 pandemic in 2019, all aspects of people's lives have been greatly affected, including changes in moral judgment (Francis & McNabb, 2022; Maftei et al., 2022). Future studies should ensure that all data used are collected simultaneously. Moreover, the CNI model could be applied to more countries and regions in the future for cross-cultural examinations to ensure further validation and improvement.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s12144-023-04662-6.

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Data Availability The data that support the findings of this study are available on request from the corresponding author, upon reasonable request.

Declarations

Conflicting interests The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

- Armstrong, J., Friesdorf, R., & Conway, P. (2019). Clarifying gender differences in moral dilemma judgments: The complementary roles of harm aversion and action aversion. Social Psychological and Personality Science, 10(3), 353–363. https://doi.org/10.1177/ 1948550618755873
- Arutyunova, K. R., Alexandrov, Y. I., & Hauser, M. D. (2016). Sociocultural influences on moral judgments: East–west, male–female, and young–old. Frontiers in Psychology, 7, 1334. https://doi.org/ 10.3389/fpsyg.2016.01334
- Atari, M., Lai, M. H. C., & Dehghani, M. (2020). Sex differences in moral judgements across 67 countries. *Proceedings. Biological Sciences*, 287(1937), 1201. https://doi.org/10.1098/rspb.2020. 1201
- Awad, E., Dsouza, S., Shariff, A., Rahwan, I., & Bonnefon, J. F. (2020). Universals and variations in moral decisions made in 42 countries by 70,000 participants. *Proceedings of the National Academy of Sciences of the United States of America*, 117(5), 2332–2337. https://doi.org/10.1073/pnas.1911517117
- Bartels, D. M., & Pizarro, D. A. (2011). The mismeasure of morals: Antisocial personality traits predict utilitarian responses to moral dilemmas. *Cognition*, 121(1), 154–161. https://doi.org/10.1016/j.cognition.2011.05.010
- Białek, M., Paruzel-Czachura, M., & Gawronski, B. (2019). Foreign language effects on moral dilemma judgments: An analysis using the CNI model. *Journal of Experimental Social Psychology*, 85, 103855. https://doi.org/10.1016/j.jesp.2019.103855.
- Brannon, S. M., Carr, S., Jin, E. S., Josephs, R. A., & Gawronski, B. (2019). Exogenous testosterone increases sensitivity to moral norms in moral dilemma judgments. *Nature Human Behaviour*, *3*(8), 856–866. https://doi.org/10.1038/s41562-019-0641-3
- Buckels, E. E., Trapnell, P. D., Andjelovic, T., & Paulhus, D. L. (2019). Internet trolling and everyday sadism: Parallel effects on pain perception and moral judgment. *Journal of Personality*, 87(2), 328–340. https://doi.org/10.1111/jopy.12393
- Cao, S. (2022). Cultivating shenti in everyday life: Self, relationality and embodied masculinity in China. *Sociological Review*, 70(3), 438–454. https://doi.org/10.1177/00380261211059669
- Carron, R., Blanc, N., & Brigaud, E. (2022). Contextualizing sacrificial dilemmas within Covid-19 for the study of moral judgment. *PLOS ONE*, 17(8), e0273521. https://doi.org/10.1371/journal.pone. 0273521
- Cheng, X. (2000). Asian students' reticence revisited. *System*, 28(3), 435–446. https://doi.org/10.1016/S0346-251X(00)00015-4
- Conway, P., & Gawronski, B. (2013). Deontological and utilitarian inclinations in moral decision making: A process dissociation approach. *Journal of Personality and Social Psychology*, 104(2), 216–235. https://doi.org/10.1037/a0031021
- Cornwell, J. F. M., & Bella, A. F. (2022). Morals for the sake of movement: Locomotion and sensitivity to norms in moral dilemmas. *Journal of Experimental Social Psychology*, *101*, 104322. https://doi.org/10.1016/j.jesp.2022.104322



- Duan, L., Mo, S. L., Fan, C. Y., & Liu, H. S. (2012). The role of mental states and causality in moral judgment: Examination on dual-process theory of moral judgment. *Acta Psychologica Sinica*, 44(12), 1607–1617. https://doi.org/10.3724/SPJ.1041.2012.01607
- Francis, K. B., & McNabb, C. B. (2022). Moral decision-making during COVID-19: Moral judgements, moralisation, and everyday behaviour. *Frontiers in Psychology*, 12, 6484.
- Fumagalli, M., Ferrucci, R., Mameli, F., Marceglia, S., Mrakic-Sposta, S., Zago, S., Lucchiari, C., Consonni, D., Nordio, F., Pravettoni, G., Cappa, S., & Priori, A. (2010). Gender-related differences in moral judgments. *Cognitive Processing*, 11(3), 219–226. https://doi.org/10.1007/s10339-009-0335-2
- Gawronski, B., Armstrong, J., Conway, P., Friesdorf, R., & Hütter, M. (2017). Consequences, norms, and generalized inaction in moral dilemmas: The CNI model of moral decision-making. *Journal of Personality and Social Psychology*, 113(3), 343–376. https://doi. org/10.1037/pspa0000086
- Gawronski, B., Conway, P., Armstrong, J., Friesdorf, R., & Hütter, M. (2018). Effects of incidental emotions on moral dilemma judgments: An analysis using the CNI model. *Emotion*, 18(7), 989–1008. https://doi.org/10.1037/emo0000399
- Germani, A., Delvecchio, E., Li, J. B., Lis, A., Nartova-Bochaver, S. K., Vazsonyi, A. T., & Mazzeschi, C. (2021). The link between individualism–collectivism and life satisfaction among emerging adults from four countries. *Applied Psychology. Health and Well-Being*, 13(2), 437–453. https://doi.org/10.1111/aphw.12259
- Gold, N., Colman, A. M., & Pulford, B. D. (2014). Cultural differences in responses to real-life and hypothetical trolley problems. *Judg-ment and Decision Making*, 9(1), 65–76. https://doi.org/10.1017/ S193029750000499X
- Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Journal of Personality and Social Psychology*, 96(5), 1029–1046. https://doi.org/10.1037/a0015141
- Greene, J. D. (2009). Dual-process morality and the personal/impersonal distinction: A reply to McGuire, Langdon, Coltheart, and Mackenzie. *Journal of Experimental Social Psychology*. Langdon: Coltheart and Mackenzie, 45(3), 581–584. https://doi.org/10.1016/j.jesp.2009.01.003.
- Greene, J. D., Sommerville, R. B., Nystrom, L. E., Darley, J. M., & Cohen, J. D. (2001). An fMRI investigation of emotional engagement in moral judgment. *Science*, 293(5537), 2105–2108. https://doi.org/10.1126/science.1062872
- Harenski, C. L., Antonenko, O., Shane, M. S., & Kiehl, K. A. (2008). Gender differences in neural mechanisms underlying moral sensitivity. Social Cognitive and Affective Neuroscience, 3(4), 313–321. https://doi.org/10.1093/scan/nsn026
- Hauser, D. J., & Schwarz, N. (2016). Attentive Turkers: MTurk participants perform better on online attention checks than do subject pool participants. *Behavior Research Methods*, 48(1), 400–407. https://doi.org/10.3758/s13428-015-0578-z
- Hawkins, R. X. D., Goodman, N. D., & Goldstone, R. L. (2019). The emergence of social norms and conventions. *Trends in Cognitive Sciences*, 23(2), 158–169. https://doi.org/10.1016/j.tics.2018.11. 003
- He, Y., & Li, T. (2021). Mediating model of college students' Chinese Zhongyong culture thinking mode and depressive symptoms. *Psychology Research and Behavior Management*, 14(10), 1555–1566. https://doi.org/10.2147/PRBM.S327496
- Huat, C. B. (2015). Conceptualizing an East Asian popular culture. In *Inter-Asia Cultural Studies Reader*. Routledge, (131–155).
- Körner, A., Deutsch, R., & Gawronski, B. (2020). Using the CNI model to investigate individual differences in moral dilemma judgments. Personality and Social Psychology Bulletin, 46(9), 1392–1407. https://doi.org/10.1177/0146167220907203

- Kroneisen, M., & Steghaus, S. (2021). The influence of decision time on sensitivity for consequences, moral norms, and preferences for inaction: Time, moral judgments, and the CNI model. *Journal of Behavioral Decision Making*, 34(1), 140–153. https://doi.org/10. 1002/bdm.2202
- Li, S., Ding, D., Wu, Z., Yi, L., Lai, J., & Dang, L. (2020). Do high psychopaths care more about moral consequences than low psychopaths in Chinese culture? An exploration using the CNI model. *Healthcare*, 8(4), 505. MDPI, 8(4). https://doi.org/10.3390/healt hcare8040505.
- Lim, N. (2016). Cultural differences in emotion: Differences in emotional arousal level between the East and the West. *Integrative Medicine Research*, 5(2), 105–109. https://doi.org/10.1016/j.imr. 2016.03.004
- Liu, F. (2006). Boys as only-children and girls as only-children—Parental gendered expectations of the only-child in the nuclear Chinese family in present-day China. *Gender and Education*, *18*(5), 491–505. https://doi.org/10.1080/09540250600881626
- Lu, J., Xie, J., Chen, J., Zeng, Y., Jiang, Z., Wang, Y., & Zheng, H. (2022). More utilitarian judgment in Internet addiction? An exploration using process dissociation and the CNI model. *Brain and Behavior*, 12(3), e2510. https://doi.org/10.1002/brb3.2510.
- Luke, D. M., & Gawronski, B. (2022). Temporal stability of moral dilemma judgments: A longitudinal analysis using the CNI model. *Personality and Social Psychology Bulletin*, 48(8), 1191–1203. https://doi.org/10.1177/01461672211035024
- Lykes, V. A., & Kemmelmeier, M. (2014). What predicts loneliness? Cultural difference between individualistic and collectivistic societies in Europe. *Journal of Cross-Cultural Psychology*, 45(3), 468–490. https://doi.org/10.1177/0022022113509881
- Maftei, A., Holman, A. C., & Gancevici, O. (2022). Utilitarian choices in COVID-19 dilemmas depend on whether or not a foreign language is used and type of dilemma. *Ethics and Behavior*, 32(6), 480–497. https://doi.org/10.1080/10508422.2021.1934684
- Maftoon, P., & Ziafar, M. (2013). Effective factors in interactions within Japanese EFL classrooms. Clearing House: A Journal of Educational Strategies, Issues and Ideas, 86(2), 74–79. https:// doi.org/10.1080/00098655.2012.748641
- Moore, A. B., Lee, N. Y. L., Clark, B. A. M., & Conway, A. R. A. (2011). In defense of the personal/impersonal distinction in moral psychology research: Cross-cultural validation of the dual process model of moral judgment. *Judgment and Decision Making*, 6(3), 186–195. https://doi.org/10.1017/S193029750000139X
- Moshagen, M. (2010). multiTree: A computer program for the analysis of multinomial processing tree models. *Behavior Research Methods*, 42(1), 42–54. https://doi.org/10.3758/BRM.42.1.42
- Ng, S., Kim, H., & Rao, A. R. (2015). Sins of omission versus commission: Cross-cultural differences in brand-switching due to dissatisfaction induced by individual versus group action and inaction. *Journal of Consumer Psychology*, 25(1), 89–100. https://doi.org/10.1016/j.jcps.2014.07.003
- Nucci, L. P., & Turiel, E. (2000). The moral and the personal: Sources of social conflicts. In L. P. Nucci, G. B. Saxe, & E. Turiel (Eds.), *Culture, thought, and development* (pp. 115–137). Mahwah, NJ: Erlbaum.
- O'Neill, E. (2017). Kinds of norms. *Philosophy Compass*, *12*(5), e12416. https://doi.org/10.1111/phc3.12416
- Oppenheimer, D. M., Meyvis, T., & Davidenko, N. (2009). Instructional manipulation checks: Detecting satisficing to increase statistical power. *Journal of Experimental Social Psychology*, 45(4), 867–872. https://doi.org/10.1016/j.jesp.2009.03.009
- Petkova, D. P. (2015). Beyond silence: A cross-cultural comparison between Finnish "quietude" and Japanese "tranquility." *Eastern Academic Journal*, 4, 1–14.



- Ren, W. L. (2008). The political significance of Wang Gen's theory of making the self secure. *Tsing Hua Journal of Chinese Studies*, 38(2), 257–288.
- Rothbaum, F., Pott, M., Azuma, H., Miyake, K., & Weisz, J. (2000). Trade-offs in the study of culture and development: Theories, methods, and values. *Child Development*, 71(5), 1159–1161. https://doi.org/10.1111/1467-8624.00220
- Roxas, M. L., & Stoneback, J. Y. (2004). The importance of gender across cultures in ethical decision-making. *Journal of Business Ethics*, 50(2), 149–165. https://doi.org/10.1023/B:BUSI.00000 22127.51047.ef
- Shin, L. J., Armenta, C. N., Kamble, S. V., Chang, S. L., Wu, H. Y., & Lyubomirsky, S. (2020). Gratitude in collectivist and individualist cultures. *Journal of Positive Psychology*, 15(5), 598–604. https:// doi.org/10.1080/17439760.2020.1789699
- Shortland, N., McGarry, P., & Merizalde, J. (2020). Moral medical decision-making: Colliding sacred values in response to COVID-19 pandemic. *Psychological Trauma: Theory, Research, Practice and Policy*, 12(S1)(Suppl. 1), S128–S130. https://doi.org/10.1037/tra00 00612
- Sorokowski, P., Marczak, M., Misiak, M., & Białek, M. (2020). Trolley dilemma in papua. Yali horticulturalists refuse to pull the lever. *Psychonomic Bulletin and Review*, 27(2), 398–403. https://doi.org/10.3758/s13423-019-01700-y
- Tang, Y. (2015). Some reflections on new Confucianism in Chinese Mainland culture of the 1990s. In *Confucianism, Buddhism, Daoism, Christianity and Chinese culture* (pp. 67–78). https://doi.org/ 10.1007/978-3-662-45533-3_5

- Tännsjö, T., & Ahlenius, H. (2012). Chinese and Westerners respond differently to the trolley dilemmas. *Journal of Cognition and Culture*, 12(3–4), 195–201. https://doi.org/10.1163/15685373-12342073
- Wei, X., & Li, Q. (2013). The Confucian value of harmony and its influence on Chinese social interaction. Cross-Cultural Communication, 9(1), 60–66.
- Winskel, H., & Bhatt, D. (2020). The role of culture and language in moral decision-making. *Culture and Brain*, 8(2), 207–225. https://doi.org/10.1007/s40167-019-00085-y
- Young, D. A. (2009). Bowing to your enemies: Courtesy, budō, and Japan. *Philosophy East and West*, 59(2), 188–215.
- Zeng, Y., & Hesketh, T. (2016). The effects of China's universal two-child policy. *Lancet*, 388(10054), 1930–1938. https://doi.org/10.1016/ S0140-6736(16)31405-2

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