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Selfish or altruistic? The influence of thinking styles and stereotypes on moral decision-making

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ABSTRACT

This study aimed to explore the influence of individual thinking styles and stereotypes on moral decision-making. 114 participants completed the Rational-Experiential Inventory-40, after which they performed a moral decision-making task in which participants were asked to decide whether to sacrifice their self-interest to help the protagonists in the moral dilemmas. The results showed that: (1) Experiential participants were more likely to make altruistic moral decisions as compared to Rational participants. (2) Participants were more willing to help the protagonists who had both high-warmth and high-competence, and were less willing to help the protagonists with both low-warmth and low-competence. (3) The moral decisions of the rational participants were influenced by stereotypes of both warmth and competence, while the experiential participants were affected only by the stereotypes of warmth. These results suggest that rational participants may show preference towards protagonists with different levels of both warmth and competence during moral decision-making, and that experiential participants may only prefer to help protagonists with high levels of warmth. This study provides a reference point from which we might further explore the influencing factors of moral decision-making, and helps in understanding how people might make more appropriate decisions in the face of similar scenarios.

1. Introduction

In recent years, Europe has experienced an unprecedented wave of refugee arrivals with countless displaced people pouring into European countries from the Middle East. European countries are in a dilemma of whether to sacrifice self-interests to help these refugees or not. If they do, it could mean bearing the chaos and economic burden brought by the people in need. If they do not, it means choosing against humanity, and large numbers of refugees could die from coldness and hunger. When making this decision, will decision-makers with different thinking styles make different decisions? Will policymakers' stereotypes of these refugees also influence their moral decision-making? Furthermore, do stereotypes have different impacts on individual decision-making, depending on the decision-maker's particular thinking style? The current study attempted to answer these questions.

Moral decision-making is the ability to choose an optimal course of action out of multiple alternatives within a system of norms and values that guides our behavior in a community (Rilling & Sanfey, 2011). Moral decision-making is not an uncommon occurrence in real life. Psychologists have studied it extensively (Garrigan, Adlam, & Langdon, 2018; Zhan et al., 2018). At present, the dual-process theory is the most widely accepted theory in moral psychology regarding moral decision-making (Greene, Nystrom, Engell, Darley, & Cohen, 2004; Greene, Sommerville, Nystrom, Darley, & Cohen, 2001). Dual process theory considers the influences of both emotion and cognitive reasoning ability on moral judgment and decision-making, recognizing that different individuals have different inputs of emotion and cognitive ability when making judgments and decisions, and notes that this difference may be related to the individuals' thinking styles.

Previous research has proposed that people have two independent information processing systems: rational and experiential (Epstein, Pacini, & Denes-Raj, 1996). Epstein et al. (1996) found that there were individual differences in the extent to which individuals rely on information processing systems, and created the Rational Experiential Inventory (REI-40) to measure the differences. They found that individuals with a rational thinking style prefer logical and causal cognitive

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processing, while individuals with an experiential thinking style prefer heuristic, emotional, and spontaneous processing. These results have been verified by several scholars showing that those with a rational thinking style tend to make normative judgments and avoid biases, while individuals with an experiential thinking style tend to make more heuristic judgments (Shiloh, Salton, & Sharabi, 2002).

Thinking style has been found to influence moral decision-making. Studies proposed that individuals with a rational thinking style are more likely to make utilitarian judgments and decisions in both the "Footbridge Dilemma" and "Trolley Dilemma" (Greene et al., 2001), while individuals with an experiential thinking style are more likely to make deontological moral judgments and decisions (Li, Xia, Wu, & Chen, 2018; Paul & Bertram, 2013). Researchers have studied moral judgments in dilemma situations and found that utilitarian decision-making primarily activates dorsolateral prefrontal cortex (DLPFC), a cognitive center that is mainly responsible for logical judgment and abstract reasoning in moral decision-making. Deontological decisions, on the other hand, primarily activate ventral prefrontal cortex (VMPFC), an important indicator of emotional activation in moral decision-making, which may reflect that deontological decisions may be driven by emotions (Greene et al., 2001). Ultimately, we know that rational individuals who prefer cognitive processing will make more utilitarian decisions, while experiential individuals who prefer emotional processing will make more deontological decisions. However, in the moral dilemma between altruism and self-interest, the influence of thinking style on moral decision-making has rarely been studied.

A large number of studies have shown that pro-social decisions are influenced by thinking styles (Rand, 2016; Rand, Greene, & Nowak, 2012). But whether rational or experiential thinking makes people more prosocial is a matter of debate. Some scholars believe that selfishness is a spontaneous tendency in individuals, while prosocial needs require deliberate control over oneself (Steinbeis, Bernhardt, & Singer, 2012). Dewall, Baumeister, Gailliot, and Maner (2008) found that a loss of self-regulation ability reduces one's willingness to help others, which may indicate that prosocial behaviors require self-restraint. However, other researchers have suggested that prosociality should be intuitive and spontaneous (Zaki & Mitchell, 2013). Rand et al. (2012) found that forcing participants to make a quick decision would increase their donations amount in economic games, while forcing them to make a slow decision would reduce the donation amount. Another study indicated that participants with an experiential thinking style were more inclined to share than rational participants (Kinnunen & Windmann, 2013). Other studies have used situation or time pressures to show that deliberate thinking reduces cooperative behavior, while experiential thinking increases cooperative and altruistic behavior (Bear & Rand, 2016; Evans, Dillon, & Rand, 2015).

By and large, it is difficult to draw a conclusion as to whether a rational or an experiential thinking style causes a person to make more prosocial decisions. The reasons for contradictions on this topic may be due to the limitations of these past studies. First, none of these studies examined the relationship between an individual's stable thinking style and prosocial behavioral decisions, but rather they only manipulated the decision time to distinguish between deliberate thinking and experiential thinking (Evans et al., 2015). Second, previous studies exploring the relationship between prosocial decision-making and thinking style have usually adopted economic games, wherein the situations generally appear relatively simple and unreal. Therefore, to examine individuals' stable thinking style, this current study used moral dilemmas to explore how individuals with different thinking styles make decisions specifically between altruism and self-interest.

In addition to thinking style, numerous studies have shown that decision-making can be influenced by socially biased information (Hilbert & Martin, 2012), and by stereotypes in particular (Fabre, Causse, Pesciarelli, & Cacciari, 2015). Previous research has found that the "beauty is good" stereotype influenced moral assessments and trait judgments (Dion, Berscheid, & Walster, 1972). Even when assessing an intentional criminal or a hostile act, age and gender stereotypes have been shown to bias moral judgments, with people making more negative judgments about the perpetrator when the victim is older or female rather than younger or male (Chu & Gruhn, 2018).

The Stereotype Content Model (SCM) has proposed that stereotypes of social groups are made up of two primary dimensions: warmth and competence (Fiske, Cuddy, Glick, & Xu, 2002). Specifically, the theory asserts that a large number of social groups can be divided into four categories which form the basis for all stereotypes: high warmth-high competence (HW-HC), high warmth-low competence (HW-LC), low warmth-high competence (LW-HC), and low warmth-low competence (LW-LC). Cuddy, Fiske, and Glick (2007) have proposed that in-group preferences and stereotypes can cause participants to have different emotional experiences, thus affecting individual behaviors. Cikara, Farnsworth, Harris, and Fiske (2010) found that 84% of participants were more willing to accept the sacrifice of one LW-LC person to save five HW-LC people in footbridge dilemma. Moreover, they also found that stereotypes affect an individual's nervous system during moral decision-making, and predicted that the dimensions of warmth and competence in a stereotype may be important factors affecting moral decision-making.

In our study, we speculated that thinking styles and stereotypes interact in moral decision-making. Researchers have found that when playing games with stereotypical female stereotype proposers, participants were more motivated to engage in costly and deliberate reasoning, while when playing games with stereotypical male stereotype proposers, more positive and strong emotions were evoked in participants (Fabre et al., 2015). This indicates that these stereotypes affect the thinking process when participants are making decisions. Further research has found that rational thinking is less influenced by external socially biased information during decision-making (Shiloh et al., 2002). Previous research has proposed that the automatic activation of stereotypes can be overcome by engaging an individual's mindset to think differently (Sassenberg & Moskowitz, 2005). Another study found that priming participants to engage in comparative thinking with a generalized focus on difference reduced behavioral and judgmental stereotyping effects (Corcoran, Hundhammer, & Mussweiler, 2009). An experiential thinking style, meanwhile, is more likely to associate external information and more likely to be influenced by emotions, and is therefore more likely to be influenced by stereotypes (Pacini & Epstein, 1999). Individuals with an experiential thinking style tends to make more heuristic judgments than rational individuals (Shiloh et al., 2002). Previous research has shown that making unethical decisions or sacrifices generates moral aversion, which is mediated by stereotypes (Cikara et al., 2010). Individuals with an experiential thinking style are more susceptible to emotional changes. Therefore, they may be more sensitive to different groups of stereotypes (Epstein et al. (1996)).

The following hypotheses were proposed for the current study: H1, Individuals with different thinking styles differ in the helpfulness of their moral decisions; specifically, individuals with a rational thinking style are more likely to make less altruistic moral decisions than those with an experiential thinking style. H2, Stereotypes may influence individuals' moral decisions, with warmth holding a higher value in moral decision-making than competence, thereby leading to a decision to offer more help to those perceived as being "warm". H3, thinking styles and stereotypes interact in moral decision-making; specifically, individuals with a rational thinking style may be less affected by content stereotypes than those with an experiential thinking style.

2. Method

2.1. Participants

A priori power analysis using G*Power indicated that a minimum total sample of 72 participants would be required to detect a high effect ($1\text{-}\beta = 0.95$; $\alpha = 0.05$). A total of 213 Chinese undergraduates (147

female) took part in the thinking style assessment. Next, in accordance with extreme grouping (Kelley, 1939), we regarded the top 27% of the rationality score minus the experiential score as being the typical rational style, and the top 27% of the experiential score minus the rationality score as being the typical experiential style. Finally, 114 participants (56 female) with typical rational or experiential thinking styles were selected to participate in the subsequent moral decision-making experiment based on the analysis of the thinking style scale. Among them were 59 typical rational thinking style participants and 55 typical experiential thinking style participants. Before we conducted the study, we obtained ethical approval from the Institutional Review Board (IRB) of Hunan University of Science and Technology. Written informed consent was obtained from all participants prior to commencing the experiment.

2.2. Design and measures

In this study, the 2 (thinking styles: rational style or experiential style) × 4 (stereotypes: HW-HC, HW-LC, LW-HC, LW-LC) mixed design was conducted. The dependent variable was the frequency of that the participant chose to help others in moral dilemma. The frequency of choosing to help was scored: helping scored 1 point, and refusal to help scored 0 points. The response time of the participants in making their decision was also taken as a dependent variable.

Operation of Stereotypes. Drawing on previous research, this study adopted a variation of the "distant planet paradigm" (Ufkes, Otten, van der Zee, Giebels, & Dovidio, 2012). By presenting different trait information descriptions of virtual groups to the participants, the stereotype content, warmth, and competence dimensions were operated. In other words, the Emotional Quotient (EQ) was employed to affect warmth perception, while the Intelligence Quotient (IQ) was employed to affect competence perception. In addition, the different groups were each described with different trait terms. For instance, high-warmth would be described with friendly and social. And the competence of the stereotypes was manipulated in a similar way (e.g., intelligent, capable).

Measuring Thinking Style. The revised Chinese scale of Rational-Experiential Inventory-40 (REI-40) was employed to test participants' thinking style (Epstein et al., 1996). The internal consistency of the measure was 0.816, and the internal consistency of all four subscales was above 0.60. A confirmatory factor analysis was carried out on the scale, which proved that the two-factor theoretical structure model (*GFI* = 0.85, *AGFI* = 0.87, *CFI* = 0.65, *RMSEA* = 0.06) of the Chinese version of the scale was established. The REI-40 has two rational scales and two experiential scales, each measured by 10 items using a five-point Likert scale.

Moral Dilemmas. 20 common moral dilemmas were adopted and revised from Zhan et al. (2018). Each dilemma consisted of a scenario and two options. The scenario described a dilemma wherein the protagonist desperately needs help, while "you", the participant, are conducting an important task. A decision must be made whether to aid the protagonist and give up doing your important task, or ignore their request for help and continue with your task. Participants had to choose between these two options. For example, in one scenario, someone is accidentally hit by a car and you are on your way to take a postgraduate entrance examination. This person needs your help urgently and needs to be taken to a hospital nearby. Will you offer your help?

2.3. Procedure

Participants were first asked to complete the REI-40 to measure their thinking style. A few days later, 114 participants with typical thinking styles were invited to the lab to participate in the moral decision-making experiment (see Fig. 1). The pilot program was compiled by *E*-prime 2.0 and the stimulus presentation was displayed on a 15.6-inch laptop. Participants were guided through an adaptation sequence lasting several minutes, and instructions for the task were given. The formal experiment consisted of four blocks. Each block began with presenting stereotype activation materials for each of the four groups, after which 20 moral dilemma scenarios were presented in a random order. The computer then presented situations involving members representing all four groups, asking the participants to make their decisions based on the current situation with consideration of the characteristics of the group members. The participants could decide to help by pressing the F key, and could cancel the help screen by pressing the J key. At the end of the experiment, the purpose of the experiment was explained to participants and they received a fee as a reward.

2.4. Data statistics and analysis

The dependent variables were the frequency of that the participants made the moral decision to help and their reaction time in making the moral decision. Participants scored one point when they chose to help in the moral dilemma and zero points when they chose not to help. The frequencies of when they decided to help and the reaction time it took to make the decision were analyzed using a mixed-measures ANOVA. Bonferroni-corrected post hoc comparisons were performed for every significant main effect or interaction.

3. Results

3.1. Manipulated check of thinking styles

The independent sample *t*-test was conducted on the scores of the 114 participants looking at the rational and experiential dimensions of the scale. In the rational dimension, the scores of the typical rational thinking style participants were significantly higher than those of the typical experiential thinking style participants ($t = 7.69$, $p < .01$, $d = 1.35$). In the experiential dimension, the scores of participants with the typical rational thinking style were significantly lower than those with the typical experiential thinking style ($t = -6.43$, $p < .01$, $d = -1.21$).

3.2. Frequency of helping decisions

The 2 (thinking styles: rational, experiential) × 4 (stereotypes: HW-

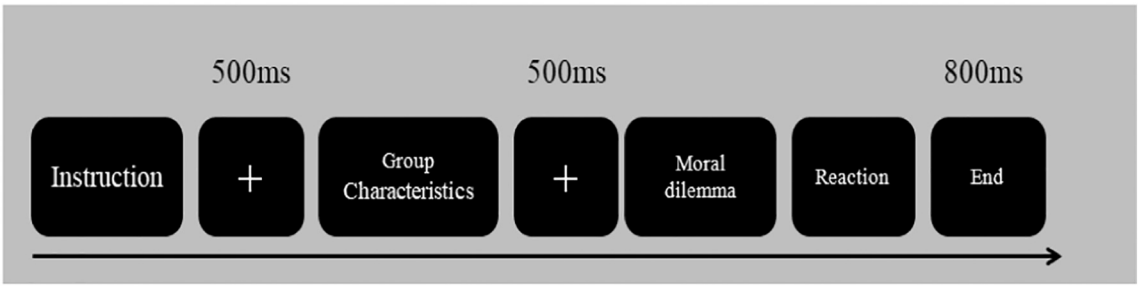

Fig. 1. Experimental procedure.

HC, HW-LC, LW-HC, LW-LC) ANOVA was conducted on the frequency of altruistic decision-making. Detailed results are shown in Table 1. The results revealed that the main effect of the thinking style was significant [F (1,103) = 15.10, $p < .01$, $\eta_p^2 = 0.11$] and that experiential thinking style participants made more helping decisions than rational participants did. Moreover, a significant main effect was observed regarding stereotypes [F (3, 348) = 36.97, $p < .01$, $\eta_p^2 = 0.24$]. Further analysis of the stereotype effect indicated that there was no significant difference between the frequencies of helping HW-HC and HW-LC ($p > .05$), but that these two stereotypes were helped significantly more often than either LW-HC or LW-LC ($p < .01$). Also, the frequency of participants helping HW-LC was significantly higher than that for LW-HC or LW-LC ($p < .01$). There was also a significant difference between the frequencies of helping LW-HC and LW- LC ($p < .01$).

Most interestingly, this study found that there was a significant interaction between thinking style and stereotype [$F(3\ ,\ 348) = 4.42$, $p < .01$. $\eta_p^2 = 0.03$ (see Fig. 2)]. Follow-up analyses revealed that the effect of the stereotype was more significant in the rational thinking style participants. A post hoc analysis showed that the frequency of participants choosing to help HW-HC was greater than that for HW-LC ($p < .05$), LW-HC, and LW-LC ($p < .01$). The frequencies of helping HW-LC were also greater than that for LW-HC and LW-LC ($p < .01$). Moreover, a significant difference was found between LW-HC and LW-LC ($p < .01$). Furthermore, the significant main effect of the stereotype in the experiential group was revealed. A post hoc analysis showed that there was no significant difference between the frequencies of choosing to help HW-HC or HW-LC. The differences between LW-HC and LW-LC were also nonsignificant. However, the frequencies of choosing to help HW-HC and HW-LC were both greater than those for LW-HC and LW-LC ($p < .01$).

3.3. Decision-making reaction time

The 2 thinking styles × 4 stereotypes ANOVA on the reaction time taken to make decisions showed a significant main effect with regards to stereotypes [F (3, 348) = 3.63, $p < .01$, $\eta_p^2 = 0.03$]. Post hoc analysis indicated that participants spent more time making moral decisions involving HW-LC or LW-HC, compared with making decisions regarding HW-HC or LW-LC ($p < .05$, $d = -0.47$). However, the main effect of thinking style and interaction was not significant (total $p \geq .29$).

4. Discussion

4.1. Rational participants are more selfish and experiential participants are more altruistic

The results indicate that there are significant differences between a rational thinking style and an experiential thinking style when it comes to moral decision-making. Specifically, experiential participants tend to help others in a moral dilemma, while rational participants are less inclined to choose to help others. However, there was no significant difference found in decision reaction time between the two styles. This is probably because response times may merely reflect the degree of decision conflict rather than the degree to which intuition and deliberation are applied (Evans et al., 2015). Earlier research has argued that rational individuals are likely to protect their own interests (Aronson, 1969). Zaki and Mitchell (2013) suggested that prosocial behavior appears to stem from processes that are intuitive, reflexive, and even automatic. Furthermore, previous research has suggested that prosociality is an experiential thinking style response, whereas deliberation may lead to more selfish decisions (Bear & Rand, 2016; Rand et al., 2012; Rand et al., 2014). Researchers have also found that a faith in intuition promoted sharing and altruistic punishment, whereas a need for cognition promoted volunteering in situations that require moral courage (Kinnunen & Windmann, 2013). The same study also found that participants with an experiential thinking style were more able to empathize with the pain of the protagonist, and experiential participants showed a higher altruistic tendency. Previous studies have also shown that altruistic behavior in empathic situations is intuitive, and that when participants experience others' feelings, they instinctively tend to make others suffer less, even if it means paying a price (Cecchetto, Korb, Rumiati, & Aiello, 2018; Sarlo et al., 2012). Therefore, our findings in the current study that experiential thinking style participants showed more helping behavior than rational thinking style participants – further verifies the past research.

4.2. One may sacrifice their personal interests to help another person

The current study suggests that stereotypes not only affect an individual's evaluation and judgment, but also their tendency to help group members. That is, participants were more willing to help those from a group with a positive stereotype (i.e., HW-HC), while they were indifferent towards a group with a negative stereotype (i.e., LW-LC). Moreover, participants' reaction times in making their decisions regarding these two extremely positive or negative groups (i.e., HW-HC, LW-LC) was shorter than the time taken to decide on a course of action regarding the other two ambivalence groups (i.e., HW-LC, LW-HC). Our results further validate the primacy-of-warmth effect, whereby an individual will focus more on the warmth dimension than on competence (Asch, 1946; Cuddy et al., 2007). Previous studies have found that evaluation and judgment of others or other groups is consistent with the evaluation validity (positive or negative stereotype) of existing stereotypes (Kliemann, Young, Scholz, & Saxe, 2008). Some researchers have also pointed out that the activation of stereotypes increases an individual's cognition regarding stereotype groups, and thus influences people's attitudes and behaviors towards their related tasks (Wheeler, Jarvis, & Petty, 2001). Previous studies have also shown that stereotypes affect behavior because they activate an individual's emotional response. Positive stereotypes trigger positive emotions that lead to both active and passive facilitation, while negative stereotypes can lead to negative emotions that will cue both active and passive harm (Cuddy et al., 2007; Fiske et al., 2002).

4.3. Rational thinking style participants are more sensitive to warmth and competence, while experiential thinking style participants get carried away by warmth

Our study revealed a significant interaction between thinking style and stereotype. Rational thinking style participants appeared to be influenced by both the dimensions of warmth and competence as presented via the protagonist stereotyping when making moral decisions, while warmth appeared to have a greater impact on the decision to help. However, experiential thinking style participants showed a difference to those with a rational thinking style, in that they appeared to be

Table 1
Descriptive statistics of moral decison.

Stereotype	HW-HC			HW-LC			LW-HC			LW-LC		
Thinking style	RS	ES	Total	RS	ES	Total	RS	ES	Total	RS	ES	Total
Mean	15.24	16.36	15.78	14.69	16.36	15.52	13.31	15.24	14.24	12.32	14.91	13.57
SD	2.74	2.22	2.55	3.18	2.25	2.88	4.01	2.61	3.52	4.14	2.53	3.68

*RS means rational style, ES means experiential style.

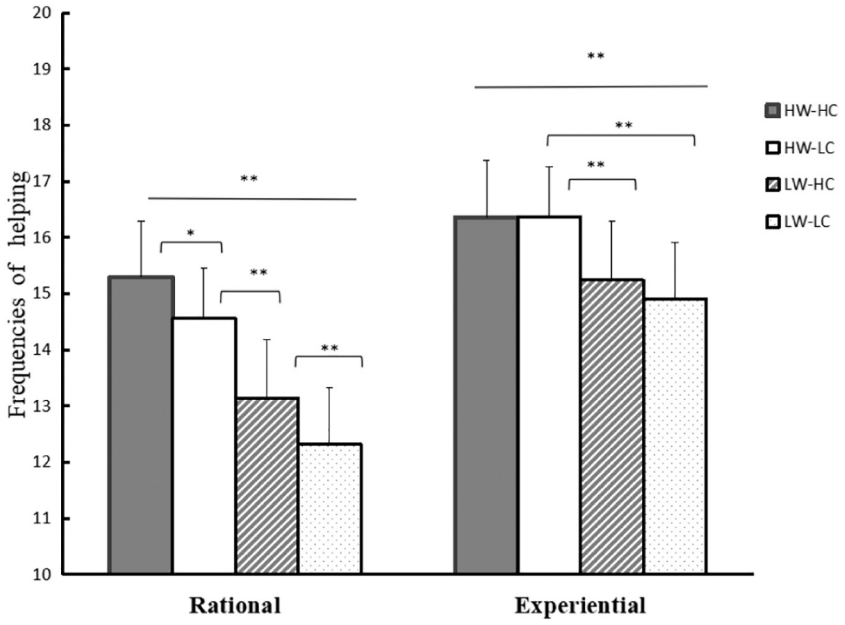

Fig. 2. Significant interaction effect between thinking style and stereotype regarding frequencies of helping. ** $p < .01$, * $p < .05$.

influenced solely by the warmth dimension of the stereotype, but not by competence. This is contrary to our initial hypothesis. We hypothesized that experiential individuals would be more sensitive to stereotypes, but found the result shows the opposite. This may be due to positive emotions triggered by a stereotype of high warmth, which could cause those with an experiential thinking style to ignore the competence dimension as perhaps, for them, warmth is enough. Negative emotions generated by low warmth had the same effect. Epstein et al. (1996) have proposed that strong emotions may lead an individual to ignore what they know about to make more rational choices. However, rational thinking style participants showed that they were more prone to reason in moral decision-making, and were also more likely to analyze the influence of both warmth and competence when assessing their own interests. This result furthers the theory that individuals with different thinking styles have performed differently based on the SCM. The results of the current study challenge the prevailing view that rational thinking is less influenced by biased information. Previous research has shown that under certain conditions, a deliberative process can facilitate biases (Ayal & Hochman, 2009; Wong, Kwong, & Ng, 2008). Furthermore, Phillips, Fletcher, Marks, and Hine (2016) conducted a meta-analysis that indicated that associations between thinking styles and decision outcomes are context dependent. The results of this current study show that in a moral dilemma situation, the effect of an individual's thinking style on their moral decision-making abilities is influenced by stereotypes. Specifically, rational thinking style participants are more susceptible to stereotype bias in moral decision-making than those with an experiential thinking style.

Some limitations did exist in this study. First, this study found that individuals with different thinking styles are affected differently by stereotypes when engaged in moral decision-making from a behavioral perspective, but this study did not seek out neural evidence of this. Future research could investigate this by employing neuroimaging techniques. Second, the participants in this study were all Chinese with no other cultural backgrounds included. Previous research has suggested that Westerners and East Asians may have different ways of thinking (Nisbett, Peng, & Choi, 2001). Future research could examine the influence of Eastern and Western thinking styles on moral decision-making through cross-cultural research.

5. Conclusion

The present study demonstrated that an individual's thinking style does influence their moral decision-making. Likewise, this study also examined the influence of stereotypes on moral decision-making and found that individuals making moral decisions can be influenced by both the perceived warmth and competence of the protagonist in a dilemma. More importantly, we found that individuals' thinking styles and stereotypes together have an interactive effect on moral decision-making. This result complements prior work in the field, specifically, that individuals are influenced by stereotypes when making decisions depending on their individual thinking style. Those with a rational thinking style are affected by both one's competence and warmth, while those with an experiential thinking style are affected by warmth alone. Furthermore, in a real-world situation, such as when dealing with the ongoing refugee crisis, these results highlight that attention should be given to the important influences of negative stereotypes and leaders' thinking styles on final decision-making.

CRediT authorship contribution statement

Fuqun Liang: Conceptualization, Formal analysis, Writing - original draft. **Qianbao Tan:** Conceptualization, Supervision, Writing - review & editing. **Youlong Zhan:** Supervision, Writing - review & editing. **Xiyan Wu:** Software, Investigation. **Jiayuan Li:** Supervision, Writing - review & editing.

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