



# Analytical thinking style leads to more utilitarian moral judgments: An exploration with a process-dissociation approach

Zhongquan Li\*, Shiyu Xia, Xiaoyuan Wu, Zhaoyu Chen

School of Social and Behavioral Sciences, Nanjing University, Nanjing, China



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## ABSTRACT

Although several studies have indicated that the analytical thinking style led to more utilitarian moral judgments, the mechanism underlying this finding was still not clear. We explored the relationship between thinking modes and moral judgment with a process-dissociation approach in two studies. In Study 1, participants were first asked to make a judgment on the moral appropriateness of the agent's utilitarian action on four moral dilemmas, and then they were asked to recall the extent to which the judgment was based on intuitive versus analytical thinking mode. In Study 2, participants were instructed to use the intuitive or the analytical thinking mode during moral judgment on six pairs of moral dilemmas. The results of both studies indicated that the analytical thinking mode led to utilitarian moral judgments. The results of Study 2 also indicated the utilitarian inclinations mediated the association between thinking modes and moral judgment.

## 1. Introduction

We make a lot of moral judgments in everyday life, from individual level to the organizational level, and to the whole societal level. Moral judgment is defined as a rating of the moral acceptability of one's own actions and those of others (Avramova & Inbar, 2013; Zhang, Kong, & Li, 2017a). Traditionally, scholars treated moral judgment as a completely rational process, such as Kohlberg (1971). Recently, scholars have increasingly recognized the role of affective process. For example, Haidt argued that intuition played an overwhelming role during moral judgment, and reasoning was only a simple post hoc justification (Haidt, 2001, 2010). To reconcile the two conflicting views, Greene and his colleagues proposed a dual-process model of moral judgment, and argued that both reasoning and intuitive processes jointly determine the final moral judgment (Greene, 2007; Greene et al., 2009; Greene & Haidt, 2002; Greene, Morelli, Lowenberg, Nystrom, & Cohen, 2008).

In moral judgment, the different degree of reliance on the reasoning and intuitive processes would result in different consequences. In the dual process model of moral judgment, utilitarian judgment is associated with the reasoning process, and deontological judgment with the intuitive process (Greene, 2014). Many neuropsychology studies have confirmed the argument. For example, greater activity in brain regions related to reasoning and cognitive control predicted utilitarian moral judgments, while greater activity in brain regions associated with intuition and emotion predicted more endorsement of deontological moral choices (Greene, Nystrom, Engell, Darley, & Cohen, 2004).

Individual differences in reliance on deliberative thinking or intuition affected the performance when individuals were asked to make a moral judgment. Pennycook, Cheyne, Barr, Koehler, and Fugelsang (2014) found that people high in analytical thinking (Measured by Cognitive Reflection Test and base-rate problems) judged disgusting actions as less morally wrong. Ward and King (2017) found individual differences in Rational-Experiential Inventory (REI) could reliably predict the harsher moral judgment, even after controlling some personality and contextual variables. There is also some indirect evidence. Moore, Clark, and Kane (2008) indicated that participants who had higher working memory capacity would have a high possibility to make utilitarian judgments when harm was inevitable, due to deliberative reasoning. Friesdorf, Conway, and Gawronski (2015) reported a robust gender effect on the preference for utilitarian over deontological judgment on certain kinds of moral dilemmas on the basis of a meta-analysis of 40 studies. Compared to men, women indicated a stronger preference for deontological over utilitarian judgments, because they experienced stronger affective responses to the moral dilemmas.

Some researchers also attempted to explore how the manipulation of the reliance on the two different processes was related to moral judgment and decision making. Paxton, Ungar, and Greene (2012) used the Cognitive Reflection Test to induce analytic thinking, and found more utilitarian judgments by analytic thinkers. Greene (2007) manipulated the cognitive load to let participants rely more on the intuitive process, and made harsher moral judgments. Suter and Hertwig (2011) nudged participants to answer quickly or to deliberate slowly,

\* Corresponding author at: School of Social and Behavioral Sciences, Nanjing University, 163 Xianlin Avenue, Qixia District, Nanjing, Jiangsu 210023, China.  
E-mail address: [zqli@nju.edu.cn](mailto:zqli@nju.edu.cn) (Z. Li).

and revealed that quicker responses resulted in more deontological answers among moral dilemmas in the harm domain. That is, under time pressure, participants have limited cognitive resource to deliberate the moral dilemmas, and rely more on the intuition. Cummins and Cummins (2012) obtained similar results regarding decision time. Hayakawa, Tannenbaum, Costa, Corey, and Keysar (2017) found that foreign language use increased endorsement of utilitarian judgment than native tongue use, because using foreign language blunted emotional reactions due to violating deontological principles.

However, in most of those mentioned studies (with exceptions of Friesdorf et al. (2015) and Hayakawa et al. (2017)), a traditional data analysis strategy was used. In this strategy, they implicitly or explicitly assumed that two moral principles, utilitarianism and deontology, were perfectly negatively correlated, and measured utilitarianism and deontology on the same scale. That is, higher preference for deontological options means lower preference for utilitarian alternatives. According to Greene (2007), these two moral principles stem from two independent psychological systems, and should be independent of each other. Recently, a process-dissociation (PD) approach proposed by Conway and Gawronski (2013) could calculate the relative strength of deontological and utilitarian inclination for each participant.

In this approach, both incongruent and congruent versions of moral dilemmas are used. For the incongruent versions, there are conflicts between deontological and utilitarian considerations. The harmful actions will be endorsed by utilitarian principles but will not be acceptable by deontological principles. For instance, in the incongruent version of the Crying Baby dilemma, the action of smothering the baby to save yourself and the others' lives is acceptable on the basis of utilitarian principles, but it violates the deontological principles. The congruent versions are identical to their corresponding incongruent versions in structure and wording except for their outcome. The deontological and utilitarian concerns are compatible with each other, and the harmful action will not be endorsed by neither deontological nor utilitarian principles. Take the congruent version of the Crying Baby dilemma for example, the action of smothering the baby to avoid laboring in the mine will not be acceptable on the basis of both deontological and utilitarian principles. Independent measures of deontological and utilitarian inclinations can be obtained by comparing choices in congruent and incongruent versions.

This technique helps us in clarifying whether an increase in deontological choice or judgment is driven by an increased deontological inclination or by a decreased utilitarian inclination. We employed this approach to reveal the underlying mechanisms responsible for the influence of the thinking modes on moral judgments. The final moral judgment depends on the relative strength of those two inclinations. If deontological inclination is higher, the final moral judgment would be a preference for deontological choice. Otherwise, the final moral judgment would be a preference for utilitarian choice.

Deontological inclinations and utilitarian inclinations are separate constructs. Greene (2007) argued that utilitarian inclinations are rooted in a cognitive cost-benefit analysis of the outcome of a harmful action, while deontological inclinations are based on emotional reactions to the harmful action. Emotion regulation strategies (Lee & Gino, 2015; Li, Wu, Zhang, & Zhang, 2017) and emotion regulation difficulties (Zhang, Li, Wu, & Zhang, 2017) selectively affect deontological inclinations but with utilitarian inclination unaffected, while cognitive load only decreased utilitarian inclination, but with deontological inclinations unchanged (Conway & Gawronski, 2013). The former was closely related to intuitive process, while the latter was closely related to the analytical process. Therefore, we proposed a hypothesis for the relationship between thinking mode and moral judgment: Analytical thinking increased utilitarian inclination, and in turn increased utilitarian moral judgment, but with deontological inclination unaffected.

In sum, the goal of our research was to explore the relationship between thinking mode and moral judgment directly, and to clarify the underlying mechanism. In Study 1, we investigated the relationship

between thinking mode and moral judgment, and attempted to replicate previous findings. Since previous studies on the relationship between thinking mode and moral judgment were mainly conducted among samples from western cultures, we were not sure whether analytical thinking mode still led to more utilitarian moral judgment among a sample from eastern culture. Cross-cultural studies have indicated that analytic thinking is more dominant in Western cultures, and holistic thinking is more prevalent in East Asian cultures (e.g., Nisbett, Peng, Choi, & Norenzayan, 2001). Although the analytic-holistic distinction is not equivalent to dual process models, most researchers acknowledge the considerable similarities between them (Buchtel & Norenzayan, 2009). Buchtel and Norenzayan (2008) found that compared to Western participants, East Asians exhibited stronger preferences for intuitive reasoning over analytic reasoning. In Study 2, we examine the underlying mechanism of why analytical thinking leads to more utilitarian moral judgments with a process-dissociation approach.

## 2. Study 1

In this study, we examined the relationship between thinking mode and moral judgment. On the basis of the dual-process model and previous studies, we hypothesized that more reliance on the analytical thinking mode was related to more utilitarian moral judgments.

### 2.1. Method

#### 2.1.1. Participants

Ninety-eight participants (65 females, and 33 males) were recruited via campus advertisements. They were from different departments and at different grades. Their age ranged from 19 to 23 years old, with a mean of 20.65, and a standard deviation of 1.2. They were thanked with small gifts.

#### 2.1.2. Materials and procedure

Four traditional conflict moral dilemmas (Crying baby, Abortion, Vaccine policy, and Animal research) were used in the present study, which were carefully selected from previous studies (e.g., Conway & Gawronski, 2013; Greene et al., 2004). After reading the moral scenario, participants rated the appropriateness of the agent's utilitarian actions on a 6-point Likert scale (1 = completely inappropriate, 6 = completely appropriate). A higher rating meant a more utilitarian moral judgment. In addition, they rated the extent to which their judgment was based on intuition versus reason using a 9-point Likert scale (1 = exclusively on intuition, 9 = exclusively on reason). This rating format was adopted from Inbar, Cone, and Gilovich (2010). A higher rating meant a more reliance on the analytical thinking mode. Finally, they completed a demographic information questionnaire. The internal consistency for the eight dilemmas computed as Cronbach's  $\alpha$  coefficient was 0.64 in the current sample.

### 2.2. Results

All data analyses were performed using SPSS 20.0. We first obtained descriptive statistics, and then explored the relationship between thinking mode and moral judgment with hierarchical multiple regression.

#### 2.2.1. Descriptive statistics

The descriptive statistics, including the mean, standard deviation, and correlations among major variables, were displayed in Table 1. As we can see from the table, analytical thinking mode was significantly related to utilitarian moral judgment,  $r = 0.30$ ,  $p < .01$ . The more reliance on the analytical thinking mode, the higher endorsement of the utilitarian action. However, moral judgment was not related to any demographic variable, age or gender.

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