

来自 ALE 神经成像元分析的证据

胡传鹏¹ Simon B. Eickhoff^{2,3} 隋洁^{1,4} 彭凯平^{1,5}（通讯作者）

1 清华大学心理学系, 北京 10084

2 Institute of Neuroscience and Medicine (INM-1), Research Center Jülich, Jülich 52428, Germany

3 Institute of Clinical Neuroscience and Medical Psychology, Heinrich Heine University, Düsseldorf 40225, Germany

4 Department of Experimental Psychology, University of Oxford, OX1 3UD, UK

5 Department of Psychology, University of California, Berkeley, CA94720, pengkp@sem.tsinghua.edu.cn

摘要 如何进行道德判断是哲学家、心理学家和神经科学研究共同感兴趣的话题。近年来, 采用神经成像方法, 不少认知神经科学家试图去寻找道德判断的神经基础, 来验证其理论假设。但是, 目前关于道德判断的神经网络仍然没有取得一致的结论, 很重要的一个原因在于, 不同的研究中采用了不同的道德任务, 而不同的道德任务本身可能涉及到不同的认知过程, 因此其激活的脑区存在差异。心理学研究已经表明, 目前存在着两种不同的道德判断任务: 道德推理 (moral reasoning) 和道德反应 (moral reacting)。道德推理指的是人们在面临一个道德困境时, 需要通过认真地推理来得到其决策的结果; 而道德反应则指人们在面临一个违反道德的情境时, 可以快速表达其反应。这两类不同的道德判断任务中, 有着不同的认知加工。为了比较这两种不同道德判断任务的神经机制, 我们使用基于激活可能性 (Activation Likelihood Estimation, ALE) 的方法, 对已经发表的关于道德判断的神经成像研究进行元分析。首先, 我们分别对道德推理和道德反应的神经成像研究进行了单独的元分析, 其次, 我们对这两类道德判断任务的元分析结果进行联合分析 (conjunction analysis), 寻找他们共同激活的脑区。文献搜索的结果表明, 道德推理包括了 20 个实验 (521 名被试, 129 个激活点), 道德反应包括了 34 个实验 (744 名被试, 260 个激活点)。元分析的结果表明, 道德推理激活了后扣带回 (Posterior Cingulate Cortex, PCC)、左侧颞中回 (left middle temporal gyrus)、额叶内上回 (superior medial gyrus) 和右侧颞上回 (right superior temporal gyrus); 而道德反应则激活了左侧颞中回 (left middle temporal gyrus)、楔前叶 (precuneus)、双侧颞极内侧 (bilateral medial temporal pole)、额叶内上回 (left superior medial gyrus)、和左内侧颞叶 (left medial temporal gyrus)。更重要的是, 联合分析的结果表明, 道德推理与道德反应没有共同激活的区域。元分析结果表明, 道德推理与道德反应激活的大脑网络不同, 可能说明它们具有不同认知机制。

关键词 道德判断, 道德推理, 道德反应, 神经成像, ALE

Distinct Neural basis for Moral Reasoning and Moral Reacting: Evidence from ALE Based Meta-analysis of Neuroimaging Studies

Chuanpeng Hu¹ Simon B. Eickhoff^{2,3} Jie Sui^{1,4} Kaiping Peng^{1,5}

1 Department of Psychology, Tsinghua University, Beijing 10084, PR China; 2 Institute of Neuroscience and Medicine (INM-1), Research Center Jülich, Jülich 52428, Germany; 3 Institute of Clinical

Neuroscience and Medical Psychology, Heinrich Heine University, Düsseldorf 40225, Germany; 4

Department of Experimental Psychology, University of Oxford, OX1 3UD, UK; 5 Department of Psychology, University of California, Berkeley, CA94720

Abstract: How human make moral judgments? This problem has been puzzled philosophers, psychologists, and neuroscientists recently. Using newly developed neuroimaging techniques, cognitive neuroscientists tried to find the underlying neural basis for moral judgment. However, the brain network underlying moral judgment is still controversial. Moreover, researchers studying the neural basis of moral judgment without distinguishing different types of moral judgments. Some studies used moral dilemma in which participants have to reason carefully, while other using moral transgression to which participants only rate and react. Given that these two types of moral judgment involved in different psychological processes, it is possible that the activated different parts of the brain. To test this hypothesis, we first conducted two separate Activation Likelihood Estimation (ALE) based meta-analysis for neuroimaging studies that using moral reasoning and moral reacting, respectively. Then we conducted a conjunction analysis to find the common neural basis for both types of moral judgment. The literature search resulted in 20 experiments using moral dilemma (521 subjects, 129 foci) and 34 used moral violation (744 subjects, 260 foci). Our meta-analytic results showed that moral reasoning activated PCC/MCC, left middle temporal gyrus, superior medial gyrus, and right superior temporal gyrus; while moral reaction convergent activated left middle temporal gyrus, precuneus, bilateral medial temporal pole, left superior medial gyrus, and left medial temporal gyrus. More importantly, our conjunction analysis showed that there are no common regions activated by both moral reasoning and moral reacting. Our results suggest that moral reasoning and moral reacting are processed in different brain network, the potential psychological process engaged in two types of moral judgments were discussed.

Keywords: moral judgment, moral reasoning, moral reacting, neuroimaging, ALE

辩证思维对道德相对主义判断的影响

韩婷婷¹ 喻丰¹（通讯作者）

1 西安交通大学社会心理学研究所, 西安 710049, yufengfengfeng@gmail.com

摘要 道德相对主义是这样一种立场, 即认为道德准则并不是客观存在或一成不变的, 道德判断的产生取决于个体或群体所处的环境。本论文基于以往文献与实证研究假设: 辩证思维是道德相对主义的原因之一。本论文试图通过六个相关研究与实验研究, 综合运用问卷调查、实验室实验、情境实验和跨文化比较等方法, 来验证这一假设。研究 1 通过问卷调查发现辩证思维及其矛盾性维度同道德相对主义之间存在显著的正相关; 研究 2 考

查关怀/伤害领域辩证思维对道德相对主义判断的影响，结果发现启动辩证思维组比启动线性思维组显著地更加倾向于做出道德相对主义判断；研究 3 通过实验室情境实验，考查辩证思维对关怀/伤害、公正/欺骗、忠诚/背叛、权威/颠覆和纯洁/堕落五个领域的道德情境下道德相对主义判断的影响，结果发现在前四个领域中，启动辩证思维组比启动线性思维组显著地更加倾向于做出道德相对主义判断，而在纯洁/堕落领域两组的道德相对主义判断不存在显著差异；为了检验研究 2 和研究 3 的效度，研究 4 考查高低辩证思维水平的个体差异对道德相对主义判断的影响。结果发现高辩证思维水平组比低辩证思维水平组在前四个道德领域都显著地更加倾向于做出道德相对主义判断，在纯洁/堕落领域两者的道德相对主义判断不存在显著差异；为了进一步检验研究的效度，研究 5 考查高低辩证思维水平的群体差异对道德相对主义判断的影响。结果发现中国被试在前四个领域上比美国被试显著地更加倾向于做出道德相对主义判断，在纯洁/堕落领域两者的道德相对主义判断不存在显著差异；研究 6 选择更加能够代表纯洁/堕落领域的道德问题严重性不同的道德情境，考查辩证思维对这些道德情境下道德相对主义判断的影响，结果发现，发现了道德问题严重性对辩证思维影响该领域道德相对主义判断具有调节作用。

关键词 道德，辩证思维，道德相对主义，道德判断

The Effect of Dialectical Thinking on Moral Relative Judgment

Han Tingting¹ Feng Yu¹

¹ Institute of Social Psychology, Xi'an Jiaotong University, Xi'an 710049, P.R. China

Abstract: Moral relativism believes that moral codes are not objective or unalterable, and the formation of moral judgments depending on certain contextual parameters related to the individuals or groups. On the basis of previous research, we proposed that dialectical thinking may be one of the very influential factors of moral relativism. In this present research, six studies were conducted to testify that dialectical thinking was one of the reasons of moral relativism by using both correlational method, causal design and other various methods including questionnaires, lab experiments, scenarios, and cross-cultural comparison. First, study one found that dialectical thinking especially its sub-scale contradiction was positively correlated with moral relativism through questionnaire survey; Second, study two explored the effect of dialectical thinking on moral relativism by using different moral scenarios of care/harm foundation and different dialectical thinking priming. We found that participants who were primed with dialectical thinking significantly tend to make moral relative judgment than participants who were primed with linear thinking; Third, to testify the results in various moral domains, study 3 explored the effect of dialectical thinking on moral relativism in the foundation of care/harm, fairness/cheating, loyalty/betrayal, authority/subversion and sanctity/degradation, by using lab experiment and dialectical thinking prime. We found when compared to linear thinking priming, participants who were primed with dialectical thinking were significantly more inclined to make moral relative judgment in the foundation of care/harm, fairness/cheating, loyalty/betrayal, authority/subversion, but failed in sanctity/degradation; Fourth, study four explored the effect of individual difference of dialectical thinking on moral relative judgment. We found when compared to low dialectical thinkers, high dialectical thinkers were significantly more inclined to make moral relative judgment in the foundation of care/harm, fairness/cheating, loyalty/betrayal, authority/subversion, but failed in sanctity/degradation; Fifth, study five explored the effect of group difference of dialectical thinking on moral relative judgment. We found that compared to the American participants, Chinese participants significantly more inclined to make moral relative judgment in the foundation of care/harm, fairness/cheating, loyalty/betrayal, authority/subversion, but failed in sanctity/degradation; Sixth, study 6 aimed to explore the effect of dialectical thinking on moral relative judgment using different moral scenarios which were more typical, including different severity of moral question. The result confirmed our hypothesis, and suggested that the dialectical thinking could influence the moral relative judgment in the foundation of sanctity/degradation, and the severity of moral question was a moderator between dialectical thinking and moral relative judgment in the foundation of sanctity/degradation.

Keywords: moral, dialectical thinking, moral relativism, moral judgment

拟人化对道德责任归因的影响

郭家骅¹ 喻丰²（通讯作者） 彭凯平^{1,3}

¹ 清华大学心理学系，北京 100084; ² 西安交通大学社会心理学研究所，西安 710049, yufengfengfeng@gmail.com;

³ Department of Psychology, University of California, Berkeley, CA94720

摘要 人类心智能力可以归为两个独立的维度：能动性（Agency）和感受性（Experience），感受性用以区分人与非生物，是人所具备的被动感受客观世界的能力；能动性区分人与其他生物，是人主动改造世界的能力，而人性则是二者的高度统一。拟人化（Anthropomorphism），便是把这样的人的属性赋予到非人客体之上的过程。每当一件涉及道德、涉及伤害的事情发生后，人总是倾向于对“谁该为此负责”做出解释和归因，当造成伤害的是一个非人的客体时，当伤害发起者为一个似人的客体时，当伤害发起者为一个感受性或能动性很强的非人客体时，这个客体本身以及其拥有者应对事件负多大责任？会不会存在责任分散的现象，即本身不具备为一件事情负责的事物，由于人们在感知它的时候认为其具有一定人的能力，而分担了一部分本属于其拥有者所该承担的责任？本研究通过操纵对物体的拟人化程度进行了 2 个实验，来观察道德责任归因的差异去解释以上问题。研究 1 中，通过操纵目标客体是否拟人化发现，在特定的情境中，拟人化的客体造成不良结果之后，其主人所承担的责任会更少。研究 2 中，通过操纵目标客体的拟人化方式发现，在特定的情境中，相较于感受性高的客体以及一般程度的拟人化客体，能动性高的客体在造成伤害之后会被认为应为此负更大的责任。

关键词 拟人化，责任归因，能动性，感受性