

Original Article

Reinforcement Sensitivity, Moral Cognition, Moral Identity, and Moral Judgment among College students

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Abstract

Introduction: Morality and moral behavior are one of the main themes of psychology. The aim of the present study was to investigate the relationship between reinforcement sensitivity, moral identity, moral cognition and utilitarianism in personal and impersonal moral judgments.

Method: Statistical population consisted of 303 students (only males) were randomly selected through multi-stage cluster random sampling method.

Results: Results showed a strong relationship between Reinforcement Sensitivity dimensions with moral identity, moral cognition and personal and impersonal moral judgment. The series of multiple regression analyses showed that Fight-Flight-Freeze systems (FFFS) were strongly able to predict moral dimensions of cognition, identity and moral judgment. FFFS were strong predictors in all of moral dimensions.

Conclusion: The results expand the understanding of the moral dimensions and indicate how domains of reinforcement sensitivity could explain the moral identity, moral cognition and utilitarianism in moral judgments.

Declaration of Interest: None.

Key words: Reinforcement sensitivity, moral identity, moral cognition, moral judgment.

Introduction

Moral psychology for decades was dominated by theories of rational by Kantian, which emphasized the importance of making informed decisions on moral judgment. According to this perspective, there are individual differences in cognitive control, which leads to ethical decision-making, meaning that higher cognitive control leads to utilitarianism (1). On the other hand new approaches focused on the role of emotions in moral judgments (2-5). Wide range of cognitive processes including attention, memory and emotion are controlled by the underlying cerebral cortex structures, and have influence on orientation, judgment and decision making; In accordance with this approach, emotional processes play an

important role in human decision making, including the moral decision making (6-8).

Green et al. (2, 3) believe in personal moral judgment, Person to save the lives of other people directly pays committing violence against the person close (like your kids) or a stranger.

These judgments have three criteria: 1. cause serious bodily injury, 2. this damage enters to a specific person, and 3. in direct manner and stories that do not have these criteria, are considered impersonal; these judgments are influenced by the social and emotional factors, while impersonal moral judgments are guided more by cognitive processes and do not have personal moral judgment criteria (2, 3). The findings of this researchers indicate that areas related to emotion and social cognition (the medial prefrontal cortex, posterior cingulate

gyrus and the superior temporal gyrus, temporal parietal junction) show more activity in personal moral judgments; while cognitive areas of the brain, which are associated with abstract reasoning and problem solving are more active in impersonal moral judgments (2, 3, 9). Thus brain areas associated with emotion are more involved in personal moral judgments, while impersonal moral judgments are processed in the areas of brains cognitive, accordingly there is a distinct neural basis in the processing of these two types of judgment. Thus, the emotion can determined processing strategies used during carrying out the task (10). One of the theories closely associated with emotion; in particular neuropsychology of personality, mood, and emotion is reinforcement sensitivity Theory.

In Reinforcement Sensitivity Theory (RST) (11) differences in brain systems are underlie of individual personality and psychopathology (12). In the original theory, the behavioral activation system activated in response to reward, and the behavioral inhibition system, activated in response to punishment (12). In the substantial revisions of RST, the BIS has been divided into two system: fight-flight-freeze (FFFS) and the behavioral inhibition-anxiety system. RST suggests that the FFFS responds to aversive stimuli, whereas the revised behavioral inhibition-anxiety system, resolves approach versus avoidance of a stimulus and activation of the FFFS and BAS (13). According to revised Reinforcement Sensitivity Theory (r-RST), impulsivity, anxiety, and fear are mediated via BAS, behavioral inhibition-anxiety, and FFFS respectively (14). Consistent with RST, high sensitivity of these systems may have an increased risk for psychological disorders (14), So that elevated FFFS are Predisposing factor to phobia and panic, individuals with high levels of behavioral activation system activity are prone to addictive, and those with a elevations of behavioral inhibition system have an increased risk of anxiety disorders (13). This study investigated the role of reinforcement sensitivity in moral identity, moral cognition, in particular in association with personal and impersonal moral judgment.

Method

Participants and Procedure

Statistical population consisted of 303 students (only males) were randomly selected through multi-stage cluster random sampling method. Inclusion criteria were being aged 18 or older and all participants reported that they had not been diagnosed with a medical condition, No history for prior psychiatric problem and No cognitive deficits. The instruments used in this research were as followed:

Reinforcement Sensitivity Questionnaire (RSQ): RSQ was applied as a scale of rRST constructs. The questionnaire comprises 29 questions which assess the following dimensions: reward interest, goal-drive persistence, reward reactivity, and impulsivity, for assessment of the BAS, FFFS, BIS, and panic. The response format is a 4-point Likert scale, with the categories named "Not at all", "Slightly", "Moderately", and "Highly". The final 29 Questions were selected from set of 60 items, according to three criteria –reduction of the inter-correlation between scales , item content and the number of Questions in scales (15).

Moral Identity Questionnaire: This questionnaire developed to assess moral identity and contains two subscales moral integrity and self-moral which contains 20 items, and scoring is based on the Likert scale. Alpha coefficient of questionnaire and two subscales of the moral integrity and self-moral is obtained 0/91, 0/89 and 0/86 respectively which represents the good psychometric properties of the questionnaire (16)

Morality Founded on Divine Authority scale: This questionnaire is developed to assess moral cognition and contains 20 items and some items has reversed scoring. Alpha coefficient of questionnaire 0/98 is obtained which represents the good psychometric properties of the questionnaire (17).

Personal and impersonal moral judgments: In the present study, moral stories of Greene et al. (3), which is divided into two categories: personal and impersonal moral judgment was used to assess the moral judgment. The order of presentation of the types of stories was randomized across subjects to exclude any

presentation order effects on moral judgments. The ecological and structure validity of the tools have been studied by Amiri et al (19, 20).

Data analytic strategy

SPSS (SPSS IBM, New York) was used to perform statistical analyses. Descriptive,

bivariate correlations and regressions were conducted to test the of associations.

Results

Descriptive statistics and bivariate correlations are showed in Table 1.

Table 1: bivariate correlations, means, and standard deviations for study variables

Variables	1	2	3	4	5	6	7	8	9	10
Moral-Self	1									
Moral Integrity	-.08	1								
Moral Cognition	.43**	.18**	1							
Personal	.05	-	-.12*	1						
Impersonal	-.09	-.03	-	.15**	1					
Bis	.12*	-	.17**	.04	-.01	1				
Bas	-.03	-.13*	.09	-.02	.22**	.29**	1			
Fight	-	-	-	.01	.15*	.30**	.33**	1		
Flight	.15*	.01	.26**	-.13*	-.08	.32**	.20**	.11	1	
Freeze	.14*	-	.06	.27**	.05	.36**	.12*	.21**	.32**	1
M	42.9	40.3	79.1	4.7	5.5	20.6	17.9	15.2	15.7	12.9
SD	4.3	8.7	8.1	1.7	1.5	3.2	2.8	4.5	2.7	3.6
Minimum	26	12	59	2	2	11	8	6	6	5
Maximum	63	67	98	9	10	28	24	37	20	20
Skew	-.38	-.74	-.16	.32	.21	-.36	-.03	.48	-.88	-.13
Kurtosis	.59	.65	.41	-.61	.58	.06	.50	.36	.83	-.66

*p<.05.

**p<.01.

Skew and kurtosis are normal (-1 to 1) (21). Bivariate correlations showed that the BIS and Flight systems negatively and Fight system positively were associated with moral cognition. Reinforcement sensitivity dimensions include BIS, Flight and freeze positively and Fight system negatively were associated with moral-self aspect of moral identity, as well as all of reinforcement

sensitivity dimensions exclude Flight system negatively were associated with moral integrity aspect of moral identity. The Flight system negatively and Freeze system positively were associated with personal moral judgment. The BAS and Fight systems positively were associated with impersonal moral judgment (see Table 1).

Table 2: Multiple hierarchical regression analyses

Predict or	Moral Cognition			Moral Identity		
	F (5, 297)	R ²	β	F (5, 297)	R ²	β
Bis	18.29***	.24	.19***	31.76***	.35	.09
Bas			.13*			.01
Fight			-.43***			-.046***
Flight			.23***			.20***
Freeze			-.01			-.35***
	Personal Moral Judgment			Impersonal Moral Judgment		
Bis	8.79***	.13	-.01	5.05***	.08	-.09
Bas			.01			.23***
Fight			-.04			.10
Flight			-.025***			-.13*
Freeze			.36***			.07

Note. Standardized regression coefficients (β) are reported

***p<.001 *p<.01

Regressions analyses showed that Fight-Flight-Freeze systems (FFFS) were strongly able to predict moral dimensions (cognition, identity and moral Judgment).

Discussion

This study examined the role of reinforcement sensitivity and its components on moral cognition, moral identity and moral judgment. The results showed that Fight-Flight-Freeze systems (FFFS) stability and robustness were associated with moral identity, moral cognition and moral judgment. Behavioral inhibition system showed a positive correlation with moral cognition and component of moral identity. BIS strongly predicted moral cognition, but this result not found in the case of moral identity and moral judgment.

Behavioral activation system showed a negative correlation with moral identity, as well as this system positively predicting utilitarianism in impersonal moral judgment. This finding is consistent with Valdesolo and DeSteno (22), who showed that positive emotions reduces perceived negative message in moral judgment and leading to an increased utilitarian response. This consistency can be explained by the Tellegen, Watson and Clark (23), which express behavioral activation system is associated with positive emotion.

Thus, in accordance with the findings of the present study can be said brain/behavioral systems at the level of personality, influence moral judgment by triggering positive and negative emotions. Also, the findings of this study are consistent with the principles of the Bower's network theory, which states that information consistent with mood better are processed (24).

Fight system negatively predicting moral identity and moral cognition, But this system was no related to personal and impersonal moral judgments. On the other, Flight system positively predicting moral identity and moral cognition, and leads to lower utilitarianism in personal and impersonal moral judgment. The freeze system also is associated with low moral identity and utilitarianism in personal moral judgment. It can be said that Fight-Flight-Freeze systems (FFFS) have more powerful relationship with the moral dimensions of moral identity, moral cognition and moral judgment in comparison with behavioral activation and inhibition systems.

There are several limitations of the current study. First, participants' report was obtained retrospectively. Therefore, recall bias could impact participants' self-reporting. Additionally, it is unclear whether the current sample is presenting high activity of brain/behavioral systems (in psychopathology level). The current study was the first to

investigate the relationships between the revised reinforcement sensitivity theory and moral. Results indicated that the newly revised FFFS sensitivity have strong associations with moral dimensions. It may be that individuals who have high FFFS activity fail to adaptive behavior skills necessary to allow them to cope with negative judgment. Future studies that aim to assess for variables mediating the relationship between r-RST and moral should ideally be prospective in nature and should assess for known executive functions and emotions that are associated with moral dimensions. In conclusion, the current study provides empirical support for the role of r-RST in moral psychology.

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