Research on Robbery Offenders' Attention to Negative Emotion

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ABSTRACT

From the paradigm of visual search, this essay discusses the characteristics of attentional bias of robbers toward emotions (angry faces and happy faces). Data shows that, compared with the non-violent group, the violent group's reaction time toward angry faces is obviously shorter than happy faces, which preliminarily verifies the attentional bias of robbery offenders toward negative emotional information.

Key Words

Robbery offenders, Attentional bias, Emotional faces.

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1 Preface

Crimes committed by robbery offenders is a prominent problem in modern society which brings about destructive effect on the individual and its family, and is harmful to social stability and harmony, thus winning attention from all parties. However, previous researches on crimes committed by robbery offenders have centered upon the victims of crimes committed by robbery offenders, and little research has been made directly into crimes committed by robbery offenders. In order to look into the causes of crimes committed by robbery offenders, we must have an in-depth understanding of the robbery offenders who are the executors of crimes committed by robbery offenders.

Presently, researches on the highly aggressive group of robbery offenders have centered on personality characteristics (**LI Xuemei, KUANG Li, AI Ming, CHEN Jianmei, LI Daqi & GAO Xinxue, 2008; LI Baohua, WANG Bin, ZHANG Jinxiang, ZHANG Zeng, LIU Guixian & HU Junmei, 2010**), such as A-type personality, trait anger and trait aggressiveness. Some researches have found that, compared with low performance motivation, subjects of of A-type personality are more prone to pay attention to such words as anger, hostility and aggressiveness under the high performance motivation (**Faunce, Mapledoram & Job,2004**). And there are other researches involving the effect of school, family and society on robbery offenders (**LI Baohua, WANG Bin, ZHANG Jinxiang, ZHANG Zeng, LIU Guixian & HU Junmei, 2010; ZOU Zhili, MENG Huaqing, Hu Hua, WANG Hui, LIANG Huaping & DU Lian et al, 2011**). Nevertheless, at present, little research has been made to discuss the cognitive mechanism of robbery offenders. One argumentation considers that robbery offenders may have defects in cognitive function, for example, Teichner et al find that the cognitive function of batterers is obviously inferior to normal subjects (**Teichner et al., 2001**). Laboratory researches have also found that violent torturers with anti-social personality are unable to accurately identify the facial expressions of others (**Babcock *et al.*, 2008**). What's more, some researchers have found that robbery offenders may make all kinds of wrong cognitive decisions, for instance, they usually make subjective guess and conjecture in the event of absence of objective basis; infer a rule out of a particular event, and extend it to obviously-unsuitable circumstances; exaggerate the importance of some events; and wrongfully attribute the reasons of some events to malicious attack of others (**Eckhardt *et al.*, 1998**). Despite that we are not clear about the reasons causing those defects in cognitive function, a possible explanation is that, in social circumstances, robbery offenders are prone to put excessive attentional resources into negative stimulus, resulting in their behavioral response that is inopportune. This attentional bias is also found in anxiety neurosis and some other groups of people (**Williams *et al.*, 1996; Jansen *et al.*, 2005**). Attentional bias means that, in relation to neutral stimulus, an individual allots attentional resources to some threats that affect the existence of human beings or similar stimulus carrying unsecure factors in

priority (**Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van Ijzendoorn, 2007; MacLeod, Mathews, & Tata, 1986; Mogg, Bradley, Hyare, & Lee, 1998**). In laboratory research, we usually use angry pictures to represent threat stimulus, since the people generally think that angry faces carry threat signals, which may be the reason why an individual processes angry faces faster and more efficient (**Vuilleumier & Schwartz, 2001**), which is mainly manifested in the fact that angry faces can preferentially attract more attentional resources (e.g., **Pratto & John,1991**). Researchers define this individual's ability of perception of angry faces faster and more efficient than that of happy faces as angry ex syndrome (AES). This ex syndrome is the product of evolution of human individual, and the instinct response of a normal individual in face of threat stimulus. Because the special group of people of robbery offenders frequently engage in extremely negative events, such as killing, ill-treatment and robbery, will robbery offenders have attentional bias toward negative stimulus and be more sensitive to it?

This study takes the highly aggressive group of people of robbery offenders as the object of research, and non-robbery offenders as the group of cross reference, and selects oriental emotional faces with localized characteristics rather than abstract emotional words as stimulus materials, and in the meanwhile, select some common emotional faces in interpersonal circumstances, i.e. angry face, happy face and neutral face, to examine the cognitive characteristics of robbery offenders, so as to better understand all kinds of violent behaviors, and provide some basis for preventing and correcting crimes.

2 Research Approaches

2.1 Subjects

We select 13 robbery offenders and 13 non-robbery offenders under custody at a house of detention in Chongqing municipality of China, all of whom are male. According to the standard of classification, we select robbery offenders covering murder, kidnapping, robbery, fire-raising and rape (**Smith & Waterman, 2004**), of age between 16 and 31, and 25 on the average, and SD=7.071; non-robbery offenders covering drug trafficking and property crimes, of age between 16 and 36, and 23 on the average, and SD=4.215. All of them are dextromanual, having normal vision or corrected vision acuity, and free from color blindness or weakness. Three of the subjects are rejected in data analysis due to heavy EEG artifact, so there are only 23 valid subjects, including 12 robbery offenders and 11 non-robbery offenders.

All subjects are voluntary and have signed the Informed Consent Form for Experimental Participants, and have the right to leave at any time during the experiment.

2.2 Experimental Materials and Instruments

In order to improve the ecological validity of the stimulus, we used 3.1 version Facegen Modeller program (*http://facegen.com*) to generate emotional face pictures with oriental characteristics, and in order to have control over the interference effect of such background information as hair and neck on face identification, we tailored the face stimulus into oval shape. Emotion identification was carried out by 15 postgraduates majored in psychology over 20 groups of face pictures, selecting pictures with an emotional identification rate above 67% as target pictures for further screening, that is, at least 10 evaluators can identify the emotions accurately. And then we invited 30 undergraduates to appraise the arousal and valence of preliminarily screened emotional faces on the scale of 1-7. The grouping criteria for happy faces is valence scoring over 5, and arousal scoring over 5; the grouping criteria for angry faces is valence scoring less than 2, and arousal scoring over 3; the grouping criteria for neutral faces is valence scoring between 3 and 5, and arousal scoring less than 3 (**DAI Qin & FENG Zhengzhi, 2009**). Finally, we selected four groups of faces (including two groups of male faces and two groups of female faces), each group comprised of happy, angry and neutral faces of the same person. A face search set consists of four face pictures of a person against black background, with the point of fixation "+" appearing in the center of the field of vision of the subjects. Face pictures are presented in a diagonal position with the point of fixation in the center as the center, at 8.5° angle of view from the position of the subject.

2.3 Experimental Procedures

Visual stimulus is displayed on 14-inch notebook screens. The subject sits down 0.7m away from the notebook screen in a closed room. The experiment firstly displays point of fixation 500-1000ms, and then immediately the face search set 500ms, and requires the subject to judge whether the emotional valence of the four face pictures are consistent, by pressing "F" for consistency, and "J" for inconsistency. The subject has 1800ms to respond until the end of pressing, requiring the subject to make pressing response as quickly and accurately as possible. The time of interval between trials is 500-1500ms, during which only black background is displayed. The flow chart of the experiment is as shown in Table 1, consisting of five blocks, with each block including 128 trials, and 2-3 min of rest between blocks.

Prior to the commencement of the task, instructions are presented and explained to the subject, followed by 10 trials of experiment exercise, enabling the subject to understand the experimental task. During the experiment, the subject is required to continually stare at the point of fixation at the center of the screen, control the blinks to occur during the intervals between trials, in order to avoid excessive eye movement. The whole experiment continues for a period of 1.5 hours.

3 Results

At the time of analyzing the behavioral data, we deleted trials of wrong response by the subjects, and rejected data of response outside of the two standard deviations, and the final valid data is not less than 95%. In previous researches, the rate of accuracy is generally not taken as the object of examination, therefore, in this study, the reaction time is the only dependent variable.

This study compares the reaction

time of two groups of subjects under three conditions, i.e. interference stimulus by neutral face, and target stimulus by angry and happy faces (see Table 1). We conducted repetitive measurement deviation analysis by the following formula: 2 (groups: violent group vs non-violent group) × 3 (target stimulus types: happy face vs angry face), based on different target stimulus. The group is the factor between the subjects, and target stimulus type is factor of the subjects. The results show that, the main effect of both the group ($F_{(1.21)}=7.997$, P=.010) and the target stimulus ($F_{(2.42)}=14.573$, P=.000) are remarkable, and so is the interactive effect ($F_{(2.42)}=3.492$, P=.040). The result of simple effect analysis of fixed target stimulus types shows that, when the target stimulus is angry face, the reaction time of the violent group is faster than that of the non-violent group, and the difference is notable ($F_{(1.21)}=11.555$, P=.003). when the target stimulus is happy face, the reaction time of the violent group is also faster than that of the non-violent group, and the difference is also notable ($F_{(1.21)}=7.841$, P=.011). The result of simple effect analysis of fixed groups shows that, when the target stimulus is angry face, the reaction time of the violent group is remarkably shorter than that of happy face and neutral face (P=.000; P=.003), nevertheless, the reaction time of the non-violent group toward angry, happy and neutral faces has no notable difference (P=.098; P=.738).

In a summary of the above experimental results, with respect to positive and neutral emotional clues, the violent group has notable attentional bias toward negative emotional clue, and the non-violent group does not show remarkable attentional bias. In comparison with the non-violent group, the violent group shows more sensitive characteristics toward negative emotional stimulus.

4 Discussion

As shown by the results, reaction of robbery offenders toward angry face in neutral face set is faster than that of happy face in neutral face set and all neutral faces, and the difference is remarkable (P=.000; P=.003), and the control group has no notable difference toward the three valence of facial expressions (P=.098; P=.738), and the reaction of robbery offenders toward angry face is obviously faster than that of the control group ($F_{(1.21)}=11.555$, P=.003). This verifies our assumption from the angle of behavior that, in comparison with positive stimulus (happy face), robbery offenders have attentional bias toward negative stimulus (angry face), and are more sensitive toward negative emotion than the control group. Here the results of research on AES by **Hansen and Hansen** (**1988**), and **Purcell** (**1996**) are reproduced, i.e. the reaction toward angry face is obviously faster than happy face. This asymmetry in processing different valence of emotional faces suggests that, when perceiving emotional faces, the cognitive system considers that faces containing threat information (angry faces) are more important than emotional faces conveying good faith and friendliness (happy faces), and more meaningful to the existence of the mankind (e.g., **Treisman & Souther, 1985**), therefore, negative stimulus with potential dangerous factors can acquire attention in priority.

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Table 1. Reaction Time of Judgment against the Background of Angry, Happy and Neutral Faces (M±SD), Unit: ms.

Group	Target stimulus		
	Angry face	Happy face	Neutral face
Violent group (n=12)	526.03+33.86	551.93+31.97	559.40+30.23
Non-violent (n=11)	620.72+89.95	628.36+88.64	624.25+100.99