

## Categorization and evaluation of emotional faces in psychopathic women

Hedwig Eisenbarth<sup>a</sup>, Georg W. Alpers<sup>a,\*</sup>, Dalia Segrè<sup>b</sup>,  
Antonino Calogero<sup>c</sup>, Alessandro Angrilli<sup>b,d</sup>

<sup>a</sup> Department of Psychology, University of Würzburg, Würzburg, Germany

<sup>b</sup> Department of General Psychology, University of Padova, Padova, Italy

<sup>c</sup> Ospedale Psichiatrico Giudiziario, Castiglione delle Stiviere, Italy

<sup>d</sup> CNR Institute of Neuroscience, Section of Padova, Italy

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### Abstract

Psychopathic individuals have been shown to respond less strongly than normal controls to emotional stimuli. Data about their ability to judge emotional facial expressions are inconsistent and limited to males. To measure categorical and dimensional evaluations of emotional facial expressions in psychopathic and non-psychopathic women, 13 female psychopathic forensic inpatients, 15 female non-psychopathic forensic inmates and 16 female healthy participants were tested in an emotion-categorizing task. Emotional facial expressions were presented briefly (33 ms) or until buttonpress. Participants were to classify emotional expressions, and to rate their valence and arousal. Group differences in categorization were observed at both presentation times. Psychopathic patients performed worst with briefly presented sad expressions. Moreover, their dimensional evaluation resulted in less positive ratings for happy expressions and less arousal for angry expressions compared with the responses of non-psychopathic and normal subjects. Results shed light on the mechanism possibly underlying the emotional deficits in psychopathic women.

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### 1. Introduction

Psychopathy has been characterized as a clinical construct that comprises, amongst other characteristics, antisocial deviance and deficient affect (Hare et al., 1990) that are reflected in shallow affect, lack of empathy, remorse or guilt, and failure to accept responsibility.

According to the Violence Inhibition Model (VIM; Blair, 1995), distress cues do not inhibit aggressive behavior in psychopathic people as they do in healthy people. According to this model, the absent effect of distressing stimuli is due to a failure of the psychopathic individual to decode emotional stimuli. As part of the deficient affect, this decoding deficit can be found in reduced physiological or cortical activations in response to emotional stimuli (i.e., Kiehl et al., 2001; Benning et al., 2005) as well as in reduced behavioral responses. In particular, reactions to stimuli with sad or fearful content evoke weaker reactions in psychopathic persons

\* Corresponding author. Department of Psychology, Marcusstrasse 9-11, D-97070 Würzburg, Germany.

E-mail address: [alpers@psychologie.uni-wuerzburg.de](mailto:alpers@psychologie.uni-wuerzburg.de) (G.W. Alpers).

than in controls (e.g., Levenston et al., 2000; Blair et al., 2001). Nevertheless, reported results vary from no group differences (e.g., Campanella et al., 2005; Glass and Newman, 2005; Kreklewetz and Roesch, 2005) and even better emotion decoding performance of psychopathic participants (Habel et al., 2002) to group differences for specific facial expressions (e.g., Blair et al., 2004; Montagne et al., 2005). The latter studies found impaired emotion categorization in psychopathic participants for negative emotional expressions, but past research included only male participants. To our knowledge, there are so far no data on emotion detection or emotion categorization in psychopathic women; therefore, this study investigates facial affect recognition and evaluations in female psychopaths.

In order to consider most of the aspects of facial picture presentation, we included facial expressions of all seven basic emotions and presented the facial expressions for two different presentation durations. In one block, facial expressions were shown briefly and masked, so as to limit the processing time for decoding the corresponding emotion category and thereby revealing deficits in psychopaths' spontaneous emotion categorization compared with deficits in cognitively elaborated emotion decoding. A condition that did not limit the time to process the stimuli was included in a second block of presentations with ad libitum duration, until participants decided which button they wanted to press.

In addition to this classical categorizing task, based on Ekman's idea of distinct emotions, we also included a dimensional evaluation task based on the model of Russell (Lang, 1979; Posner et al., 2005) by asking subjects to rate their self-perceived valence and arousal levels. The use of these ratings could provide a more detailed picture of the emotion decoding deficit through the dimensional rating. Furthermore, the paradigm combines a quite obvious question on emotion in the valence dimension and a rather indirect question on emotion decoding in the arousal dimension.

In sum, this study examines differences in categorization and evaluation of emotional facial expressions between psychopathic and non-psychopathic women and a female control group.

## 2. Method

### 2.1. Design

This study was conducted in a 3 (group: female psychopathic patients, female non-psychopathic patients, and female healthy control participants)  $\times$  2 (duration: short picture presentation and ad libitum picture presen-

tation)  $\times$  7 (emotion category: afraid, angry, disgust, happy, neutral, sad, surprise) design. The dependent variables were the hit rates and the response latencies as well as the ratings of the stimuli for valence and arousal levels. Age, years of education and age-related intelligence, measured by Raven's Standard Progressive Matrices set A (Raven, 1938), were taken into account as covariates.

### 2.2. Participants

In this study three groups of participants took part ( $n=44$ ). Two groups of female forensic patients were recruited at a forensic hospital in Northern Italy (Ospedale Psichiatrico Giudiziario di Castiglione delle Stiviere). Patients were inmates in the high security psychiatric facility and were convicted for physical assault or homicide. One more group of healthy control participants was recruited at the University of Padova, and consisted of female employees working at the administration offices of the Faculty of Psychology ( $n=16$ ). For the forensic patients the PCL-R scores (Hare et al., 1990) were assessed and two groups were formed, one with scores greater than or equal to 30 ( $n=13$ ,  $M=31.77$ ,  $SD=1.17$ , range: 30–34), according to the guidelines of Hare et al. (1990), and one with scores below 30 ( $n=15$ ,  $M=17.40$ ,  $SD=6.21$ , range: 7–28). Patients with psychotic symptoms were excluded. In both patients groups the primary diagnoses of the patients were personality disorders. The distribution of the individual personality disorder diagnoses (histrionic PD, borderline PD, paranoid PD, schizotypal PD and antisocial PD) was not equal due to the priority given to the psychopathy score. Since distributions of Psychopathy Checklist-Revised scores in the normal population are very low, the group of employees was considered to be low on psychopathy.

The three groups differed significantly in age, due to the *a priori* categorization criterion based on the psychopathy score ( $F(2,41)=7.08$ ;  $P=0.01$ ). The psychopathic patients ( $M=33.00$ ;  $SD=7.66$ ) were relatively younger and differed significantly from non-psychopathic patients ( $M=46.67$ ;  $SD=14.88$ ) and from the employees ( $M=44.19$ ;  $SD=5.19$ ). There were no age differences between non-psychopathic patients and employees.

For the level of education, there was an overall difference between all groups ( $F(2,41)=8.24$ ;  $P=0.01$ ), which revealed the lowest level of education in psychopathic patients ( $M=8.15$ ;  $SD=3.08$ ) and a higher level in non-psychopathic patients ( $M=11.60$ ;  $SD=3.70$ ) and employees ( $M=13.94$ ;  $SD=4.17$ ). Concerning intelligence, the forensic groups did not differ in intelligence measured by age- and education-corrected Raven's scores ( $T(26)=8.24$ ;  $P=0.15$ ) (see Table 1).

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