

# ## Title: Categorization and evaluation of emotional faces in psychopathic women

JavaScript is disabled on your browser. Please enable JavaScript to use all the features on this page. [Skip to main content](#)[Skip to article](#)

ScienceDirect

\* Journals & Books

\* Help

\* Search

Gergo Gyori

IT University of Copenhagen

\* View **\*\*PDF\*\***

\* Download full issue

[Search ScienceDirect](#)

## Outline

1. Abstract
2. 3. Keywords
4. 1\ Introduction
5. 2\ Method
6. 3\ Results
7. 4\ Discussion
8. Acknowledgements
9. References

[Show full outline](#)

## Cited by (63)

## Figures (2)

1. 2.

## Tables (2)

1. Table 1
2. Table 2

## Psychiatry Research

Volume 159, Issues 1?2, 30 May 2008, Pages 189-195

# Categorization and evaluation of emotional faces in psychopathic women

Author links open overlay panelHedwig Eisenbarth a, Georg W. Alpers a, Dalia Segrè b, Antonino Calogero c, Alessandro Angrilli b d

[Show more](#)

[Outline](#)

[Add to Mendeley](#)

[Share](#)

[Cite](#)

<https://doi.org/10.1016/j.psychres.2007.09.001>[Get rights and content](#)

## 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.

\* Previous article in issue

\* Next article in issue

## ## Keywords

Psychopathy

Female inmates

Emotion detection

Facial expression recognition

## ## 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 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, Kreklewitz 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) × 2 (duration: short picture presentation and ad libitum picture presentation) × 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).

Table 1. Numbers of participants, numbers of right-handed/ambidextrous participants, means and standard deviations for age, education and Raven's Standard Progressive Matrices

Empty Cell	Psychopathic patients	Non-psychopathic patients	Employees	Sum
--- --- --- --- ---				
_n_	13	15	16	44

Right-hander/ambidextrous| 10/3| 14/1| 16/0| 40/4

Age| 33.00 (7.66)| 46.67 (14.88)| 44.19 (5.19)| 41.73 (11.47)

Education| 8.15 (3.08)| 11.60 (3.70)| 13.94 (4.17)| 11.43 (4.42)

Intelligence (Raven's)| 83.81 (29.55)| 99.36 (25.99)| ?| 92.14 (28.30)

Written informed consent was obtained from all participants. Each participant understood that participation was voluntary and would not result in financial or other gain nor in advantages concerning their imprisonment, and that consent could be withdrawn at any stage of the study.

### ### 2.3. Measures

#### #### 2.3.1. Psychopathy Checklist Revised

The Psychopathy Checklist Revised (PCL-R) contains 20 items on behavioral and personality features. An expert who draws on information from file review and from a semi-structured interview rates all items. The validity and reliability of the PCL-R have been demonstrated repeatedly (Hare, 2003). Harpur and colleagues (1989) proposed a two-factor model, which is the prevailing idea of psychopathy and of the PCL-R. The two factors, psychopathic personality and antisocial behavior, differentiate between personality-related features that are difficult to measure via self-report and behavioral features that correlate highly with antisocial personality disorder symptoms and diagnoses. Another model (Cooke and Michie, 2001) supports three factors derived from factor analyses, namely arrogant and deceitful interpersonal style, deficient affective experience and impulsive and irresponsible behavioral style. Thus, the PCL-R takes into account the pathological behavior as well as the specific personality style of individuals scoring high on psychopathy.

#### #### 2.3.2. Raven Standard Progressive Matrices

Raven's Standard Progressive Matrices (SPM; Raven, 1938) are a standard measure for intelligence. The SPM comprises two main components of general intelligence in a directly measurable way using robust and directly interpretable procedures. The SPM tests are made up of a series of diagrams or designs with a missing figure that should be selected among others for logical match. Those taking the tests are expected to select the correct part to complete the designs from a number of options printed underneath. By means of this task, both components of intelligence, educative and reproductive ability, can be measured.

### ### 2.4. Procedure

Before the experimental session, participants gave written consent for their participation in the study and filled in a questionnaire for demographic variables. The experimental session was conducted on a Laptop via Presentation 9.70 (Neurobehavioral Systems, 2005) and an external keyboard. Pictures of six women and six men from the Karolinska Directed Emotional Faces set (KDEF, Lundqvist et al., 1998) were chosen, each depicting anxious, angry, disgusted, happy, neutral, sad and surprised expressions in size of 20.78° × 7.98° angle of vision. In the first block of trials half of the pictures were presented once in random order for 33 ms and masked by blurred versions of each actor's neutral expression (Adobe Photoshop 6.0, San Jose). In the second block of trials, the remaining pictures were shown until a button press of the participant (ad libitum) was registered. For both blocks the participants had to choose one of seven buttons, labeled with the nouns of all basic emotions (anxiety, anger, disgust, happiness, neutral, sadness and surprise) and neutral that best matched the presented facial expression. The third task was to rate all pictures for valence (How positive or negative was this picture?) and arousal (How arousing was this picture?) on scales ranging from ? 4 to 4 and 1 to 9, respectively. After the experimental task, patients were tested for intelligence with the SPM (Raven, 1938) and received a small gift for

their participation.

### ## 3\ Results

#### ### 3.1. Categorization

An analysis of variance (ANOVA) for repeated measures revealed main effects in categorizing accuracy for duration; the accuracy was higher for ad libitum than for briefly presented stimuli ( $F_{(1,41)} = 109.31$ ,  $P < 0.001$ ) (Fig. 1).

1. Download: Download full-size image

Fig. 1. Percent of correct responses for ad libitum (A) and briefly (B) presented facial expressions ( $P < 0.050$ ).

Another main effect was found for the emotion category; the most accurate performance was found for happy facial expressions and the least accurate performance for afraid facial expressions ( $F_{(6,246)} = 51.22$ ,  $P < 0.001$ ).

The significant main effect for group showed that the employees were the most accurate, while patients with high psychopathy-scores performed worst ( $F_{(2,41)} = 4.16$ ,  $P = 0.02$ ) in the categorizing tasks. The trend for an interaction of emotion and group further indicates that these main group differences exist for all emotions except for happy and afraid facial expressions ( $F_{(12,246)} = 1.75$ ,  $P = 0.08$ ).

Post hoc tests for the interaction between emotion and group revealed significant effects between groups for sad, disgusted, neutral and surprised expressions, but not for happy, afraid or angry ones. Bonferroni-adjusted post hoc analyses for these group effects showed significant differences in categorization of sad expressions between psychopathic patients and employees, of disgusted expressions between non-psychopathic patients and employees, of neutral expressions between psychopathic patients and employees and of surprised expressions between psychopathic patients and employees (see Table 2).

Table 2. Mean percent of correct responses and standard deviations for all conditions and all participant groups; ANOVA results

Empty Cell| Psychopathic patients| Non-psychopathic patients| Employees| Significance  $F$  ( $P$ )

---|---|---|---|---

Short presentation| Afraid| 23.08 (16.01)| 22.22 (16.27)| 22.92 (15.96)| 0.01 (0.99)

Angry| 41.03 (26.01)| 40.00 (24.23)| 41.67 (29.81)| 0.02 (0.99)

Disgust| 47.44 (39.00)| 35.56 (35.00)| 51.04 (25.44)| 0.91 (0.41)

Happy| 76.92 (16.01)| 81.11 (30.12)| 91.67 (10.54)| 2.01 (0.15)

Neutral| 53.85 (40.34)| 61.11 (39.67)| 78.13 (33.18)| 1.62 (0.21)

Sad| 19.23 (17.80)| 46.67 (31.62)| 48.96 (31.90)| 4.68 (0.02)

Surprise| 47.44 (31.80)| 64.44 (32.65)| 81.25 (25.73)| 4.56 (0.02)

Ad libitum presentation| Afraid| 32.05 (19.79)| 32.22 (22.24)| 39.58 (32.13)| 0.43 (0.66)

Angry| 76.92 (27.67)| 85.56 (26.63)| 91.67 (14.91)| 1.43 (0.25)

Disgust| 52.56 (28.74)| 52.22 (29.46)| 81.25 (14.75)| 6.87 (0.01)

Happy| 93.59 (8.44)| 90.00 (23.40)| 96.88 (6.72)| 0.82 (0.45)

Neutral| 69.23 (32.52)| 82.22 (23.96)| 96.88 (6.72)| 5.30 (0.01)

Sad| 57.69 (24.17)| 66.67 (27.46)| 72.92 (22.67)| 1.35 (0.27)

Surprise| 64.10 (31.80)| 75.56 (32.65)| 88.54 (26.33)| 2.37 (0.11)

Planned contrasts between psychopathic and non-psychopathic patients in the short presentation condition showed significant differences only for sad facial expressions ( $T_{(26)} = 2.77$ ,  $P = 0.04$ ).

Taking into account the group differences in age and education as well as handedness as covariates, the main effect of group remained significant ( $F_{(2,38)} = 4.00$ ,  $P = 0.03$ ), whereas the main effects of duration and of

emotion were no longer significant. The relevance of age for the effects concerning the categorization task was reflected in the significant main effect of age ( $F(1,38) = 10.50$ ,  $P = 0.01$ ) as well as in an interaction of duration and age ( $F(1,38) = 4.56$ ,  $P = 0.04$ ).

#### #### 3.1.1. False responses

To examine the false responses in the categorization task, we calculated ratios of false positive evaluations and false negative evaluations for each emotion ( $_{?}$  (false positive)/ $_{?}$  (false negatives)) as a measure of emotion-specific response bias. We again found significant differences between short and ad libitum presentation ( $F(1,41) = 29.96$ ,  $P < 0.001$ ) as well as a trend toward a difference between groups ( $F(2,41) = 2.52$ ,  $P = 0.09$ ), resulting in an interaction of duration, emotion and group ( $F(12,246) = 2.74$ ,  $P = 0.01$ ). Thus, psychopathic patients more often erroneously categorized briefly presented facial expressions as happy with respect to other emotions (mainly surprise, angry, sad and neutral) and with respect to the other groups ( $F(2,41) = 5.46$ ,  $P = 0.01$ ). The ad libitum presented facial expressions (mainly the afraid ones) were more often categorized as angry by psychopathic patients than by employees ( $F(2,41) = 2.791$ ,  $P = 0.07$ ). Non-psychopathic patients more often erroneously categorized ad libitum presented facial expressions (mainly afraid and sad) as surprise compared with employees ( $F(2,41) = 3.32$ ,  $P = 0.05$ ).

#### ### 3.2. Dimensional evaluation

Subjective evaluations of valence and arousal dimensions in pictures were analyzed for effects of emotion category and group differences as well as for the kind of dimension (valence vs. arousal).

##### #### 3.2.1. Valence ratings

For emotional valence evaluations we found a main effect of emotion category ( $F(6,246) = 77.57$ ,  $P < 0.001$ ), but no main effect of group nor interaction of emotion category and group. The subjective evaluation of valence showed more negative evaluations for afraid, angry, disgusted and sad facial expressions, more positive evaluations for happy expressions and neutral evaluations for neutral and surprised expressions (see Fig. 2).

1. Download: Download full-size image

Fig. 2. Means and standard deviations of valence (A) and arousal (B) ratings.

##### #### 3.2.2. Arousal ratings

The differences between the groups were significant in the arousal ratings (see Fig. 2). Besides a main effect of emotion category ( $F(6,246) = 15.47$ ,  $P < 0.001$ ), in terms of more arousal for happy facial expressions and less arousal for neutral facial expressions compared with all other emotional facial expressions, we also found a main effect of group ( $F(2,41) = 3.15$ ,  $P = 0.05$ ), indicating that the psychopathic group perceived all facial expressions less arousing than the three remaining groups.

Bonferroni-corrected post hoc tests showed significant differences in arousal ratings between psychopathic and non-psychopathic patients.

#### ## 4. Discussion

This study tested the hypothesis that there are differences in emotional facial expression recognition and evaluation between psychopathic and non-psychopathic women as well as a control group of employees. Results showed a decline of categorization accuracy starting from employees, to non-psychopathic patients and psychopathic patients who performed worse in categorizing all emotions, except happy. Nevertheless there were no group differences for categorizing pictures with happy facial expressions, which were recognized quite well, and pictures with fearful expressions, which were categorized very poorly by all participants, independent of presentation

duration.

In the categorizing task, psychopathic patients differed in their accuracy from non-psychopathic patients only in one condition: the short presentation of sad facial expressions. This is in accordance with previous results for men (Stevens et al., 2001, Fullam and Dolan, 2006). But this also points to the influence of the presentation duration, which can reduce the time for cognitively evaluating the stimulus. Thus, the impairment in categorizing facial expressions could be reduced to conditions of reduced cognitive elaboration.

More relevant, to our knowledge, this study is the first to report a response bias, showing that the psychopathic group categorized briefly presented angry, sad, surprised and neutral facial expressions as happy; instead they interpreted ad libitum presented afraid expressions as angry. This misclassification directly contributes to the hypothesis that false interpretations of emotional facial expressions could be a relevant factor for antisocial behavior, which is often observed in psychopathic individuals. Moreover, these results could offer an explanation for the Violence Inhibition Model (VIM; Blair, 1995) as follows: if sad or afraid facial expressions are misinterpreted by psychopathic persons as happy or angry stimuli, this information cannot inhibit aggressive behavior.

Results concerning the dimensional evaluation of emotional facial expressions are new and provide more evidence for a reduced subjective activation of psychopathic women in response to emotional expressions. Valence ratings showed no between-groups differences; indeed psychopathic patients rated nearly all emotional facial expressions, especially angry, disgusted, neutral and surprised expressions, as less arousing than students and employees did. These results, together with data from the literature, suggest that there are differences between psychopathic and non-psychopathic inmates also at a subjective level concerning negative emotional contents, not only at a physiological level. The observed impairment in the perception of emotional facial expressions might contribute to advance our knowledge about the altered mechanisms of social interaction, in which psychopathic patients often tend to display clearly antisocial behavior. Consequently, this impairment raises the question whether it could be possible to improve psychopaths' ability to recognize the emotional contents in others' faces via focused training, but additional studies with larger samples are needed.

A further limitation of these results is that we only tested a female sample. Even if men and women with psychopathic attributes are both emotionally impaired (Hamburger et al., 1996, Warren et al., 2003) and, in general, psychopathic women show reduced physiological responses to emotional stimuli (Sutton et al., 2002), the conclusions cannot be directly generalized to psychopathic men. Future research should directly compare male and female psychopaths. Moreover, the group differences in age and intelligence suggest that age- and intelligence-matched samples should be included in future studies, preferably using a correlational approach with self-report measures (see Eisenbarth and Alpers, 2007).

The question remains, why the fearful facial expressions were categorized erroneously by all groups independently of the presentation duration, and at the same time have been rated (as expected) as rather negative and highly arousing. Reasons for this could be that the facial stimuli did not adequately represent an effective prototype of a fearful facial expression or, alternatively, the increased difficulty of attributing the correct emotion because of the high number of categories among which subjects had to choose. However, results of this study confirm the hypothesis that, similarly to

psychopathic males, psychopathic women are impaired in the perception of emotional facial expressions.

## ## Acknowledgements

This study was supported by a dissertation grant of the Konrad-Adenauer-Stiftung and by a grant from University of Padova project (N. CPDA047438) to A.A. We thank the Ospedale Psichiatrico Guidiziario di Castiglione delle Stiviere including patients and staff for collaboration, Prof. Dr. P. Pauli for useful comments, and the employees of the Università degli Studi di Padova for uncompensated participation in this study.

## Recommended articles

## ## References

1. Benning et al., 2005  
Benning S.D., Patrick C.J., Iacono W.G.  
Psychopathy, startle blink modulation, and electrodermal reactivity in twin men  
Psychophysiology, 42 (2005), pp. 753-762  
[CrossrefView in ScopusGoogle Scholar](#)
2. Blair, 1995  
Blair R.J.R.  
A cognitive developmental approach to morality: investigating the psychopath  
Cognition, 57 (1995), pp. 1-29  
[View PDFView articleView in ScopusGoogle Scholar](#)
3. Blair et al., 2001  
Blair R.J.R., Colledge E., Mitchell D.G.V.  
Somatic markers and response reversal: is there orbitofrontal cortex dysfunction in boys with psychopathic tendencies?  
Journal of Abnormal Child Psychology, 29 (2001), pp. 499-511  
[View in ScopusGoogle Scholar](#)
4. Blair et al., 2004  
Blair R.J.R., Mitchell D.G.V., Peschardt K.S., Colledge E., Leonard R.A., Shine J.H., Murray L.K., Perrett D.I.  
Reduced sensitivity to others' fearful expressions in psychopathic individuals  
Personality and Individual Differences, 37 (2004), pp. 1111-1122  
[View PDFView articleView in ScopusGoogle Scholar](#)
5. Campanella et al., 2005  
Campanella S., Vanhooandt M.E., Philippot P.  
Emotional deficit in subjects with psychopathic tendencies as assessed by the Minnesota Multiphasic Personality Inventory-2: an event-related potentials study  
Neuroscience Letters, 373 (2005), pp. 26-31  
[Google Scholar](#)
6. Cooke and Michie, 2001  
Cooke D.J., Michie C.  
Refining the construct of psychopathy: towards a hierarchical model  
Psychological Assessment, 13 (2001), pp. 171-188  
[View in ScopusGoogle Scholar](#)
7. Eisenbarth and Alpers, 2007  
Eisenbarth H., Alpers G.W.  
Validierung der deutschen Übersetzung des Psychopathy Personality Inventory (PPI) [Validation of the German translation of the Psychopathy Personality Inventory (PPI)]  
Zeitschrift für Klinische Psychologie und Psychotherapie, 36 (2007), pp. 216-224  
[CrossrefView in ScopusGoogle Scholar](#)



8. Fullam and Dolan, 2006

Fullam R., Dolan M.

Emotional information processing in violent patients with schizophrenia:  
association with psychopathy and symptomatology

Psychiatry Research, 141 (2006), pp. 29-37

[View PDF](#)[View article](#)[View in Scopus](#)[Google Scholar](#)

9. Glass and Newman, 2005

Glass S.J., Newman J.P.

Processing of facial affect in psychopathic individuals

Paper presented at the 1st Biannual Meeting of the Society for the Scientific  
Study of Psychopathy (2005)

Vancouver, BC, Canada

[Google Scholar](#)

10. Habel et al., 2002

Habel U., Kuehn E., Salloum J.B., Devos H., Schneider F.

Emotional processing in psychopathic personality

Aggressive Behavior, 28 (2002), pp. 394-400

[View in Scopus](#)[Google Scholar](#)

11. Hamburger et al., 1996

Hamburger M.E., Lilienfeld S.O., Hogben M.

Psychopathy, gender, and gender roles: implications for antisocial and  
histrionic personality disorders

Journal of Personality Disorders, 10 (1996), pp. 41-55

[Crossref](#)[View in Scopus](#)[Google Scholar](#)

12. Hare, 2003

Hare R.D.

Manual for the Hare Psychopathy Checklist-Revised  
(2nd edition), Multi-Health Systems, Toronto (2003)

[Google Scholar](#)

13. Hare et al., 1990

Hare R.D., Harpur T.J., Hakstian A.R., Forth A.E., Hart S.D., Newman J.P.

The revised psychopathy checklist: reliability and factor structure

Psychological Assessment, 2 (1990), pp. 338-341

[View in Scopus](#)[Google Scholar](#)

14. Harpur et al., 1989

Harpur T.J., Hare R.D., Hakstian A.R.

Two-factor conceptualization of psychopathy: construct validity and assessment  
implications

Psychological Assessment, 1 (1989), pp. 6-17

[View in Scopus](#)[Google Scholar](#)

15. Kiehl et al., 2001

Kiehl K.A., Smith A.M., Hare R.D., Mendrek A., Forster B.B., Brink J., Liddle  
P.F.

Limbic abnormalities in affective processing by criminal psychopaths as  
revealed by functional magnetic resonance imaging

Biological Psychiatry, 50 (2001), pp. 677-684

[View PDF](#)[View article](#)[View in Scopus](#)[Google Scholar](#)

16. Kreklewetz and Roesch, 2005

Kreklewetz K., Roesch R.

Facial affect recognition in psychopathic offenders

Paper presented at the 1st Biannual Meeting of the Society for the Scientific  
Study of Psychopathy (2005)

Vancouver, BC, Canada

[Google Scholar](#)

17. Lang, 1979

Lang P.J.

A bio-informational theory of emotional imagery

Psychophysiology, 16 (1979), pp. 495-512

CrossrefView in ScopusGoogle Scholar

18. Levenston et al., 2000

Levenston G.K., Patrick C.J., Bradley M.M., Lang P.J.

The psychopath as observer: emotion and attention in picture processing

Journal of Abnormal Psychology, 109 (2000), pp. 373-385

View in ScopusGoogle Scholar

19. Lundqvist et al., 1998

Lundqvist D., Flykt A., Ohman A.

Karolinska directed emotional faces (KDEF)

Dept. of Neurosciences, Karolinska Institute, Stockholm, Sweden (1998)

Google Scholar

20. Montagne et al., 2005

Montagne B., van Honk J., Kessels R.P.C., Frigerio E., Burt M., van Zandvoort

M.J.E., Perrett D.I., de Haan E.H.F.

Reduced efficiency in recognising fear in subjects scoring high on  
psychopathic personality characteristics

Personality and Individual Differences, 38 (2005), pp. 5-11

View PDFView articleView in ScopusGoogle Scholar

21. Posner et al., 2005

Posner J., Russell J.-A., Peterson B.-S.

The circumplex model of affect: an integrative approach to affective  
neuroscience, cognitive development, and psychopathology

Development and Psychopathology, 17 (2005), pp. 715-734

View in ScopusGoogle Scholar

22. Raven, 1938

Raven J.C.

Standard Progressive Matrices: Sets A, B, C, D, (and E), H.K. Lewis, London  
(1938)

Google Scholar

23. Stevens et al., 2001

Stevens D., Charman T., Blair R.J.R.

Recognition of emotion in facial expressions and vocal tones in children with  
psychopathic tendencies

Journal of Genetic Psychology, 162 (2001), pp. 201-211

CrossrefView in ScopusGoogle Scholar

24. Sutton et al., 2002

Sutton S.K., Vitale J.E., Newman J.P.

Emotion among women with psychopathy during picture perception

Journal of Abnormal Psychology, 111 (2002), pp. 610-619

View in ScopusGoogle Scholar

25. Warren et al., 2003

Warren J.I., Burnette M.L., South S.C., Chauhan P., Bale R., Friend R., Van  
Patten I.

Psychopathy in women: structural modeling and comorbidity

International Journal of Law and Psychiatry, 26 (2003), pp. 223-242

View PDFView articleView in ScopusGoogle Scholar

## Cited by (63)

\* ### Not just fear and sadness: Meta-analytic evidence of pervasive emotion recognition deficits for facial  
and vocal expressions in psychopathy

2012, Neuroscience and Biobehavioral Reviews

Show abstract

The present meta-analysis aimed to clarify whether deficits in emotion recognition in psychopathy are restricted to certain emotions and modalities or whether they are more pervasive. We also attempted to assess the influence of other important variables: age, and the affective factor of psychopathy. A systematic search of electronic databases and a subsequent manual search identified 26 studies that included 29 experiments ( $N = 1376$ ) involving six emotion categories (anger, disgust, fear, happiness, sadness, surprise) across three modalities (facial, vocal, postural). Meta-analyses found evidence of pervasive impairments across modalities (facial and vocal) with significant deficits evident for several emotions (i.e., not only fear and sadness) in both adults and children/adolescents. These results are consistent with recent theorizing that the amygdala, which is believed to be dysfunctional in psychopathy, has a broad role in emotion processing. We discuss limitations of the available data that restrict the ability of meta-analysis to consider the influence of age and separate the sub-factors of psychopathy, highlighting important directions for future research.

\* ### Psychopathy and Functional Magnetic Resonance Imaging Blood Oxygenation Level-Dependent Responses to Emotional Faces in Violent Patients with Schizophrenia

2009, Biological Psychiatry

Citation Excerpt :

There are no reports of impairments in the recognition of anger in psychopathic samples (21) or in patients with schizophrenia and high psychopathy scores (27). However, a recent study (54) reported reduced arousal ratings in response to angry faces in a sample of psychopathic women. Our finding that psychopathy traits are inversely correlated with amygdala and prefrontal activation patterns to angry faces warrants further study, as there is evidence that neural responses are modulated by anxiety (55) and psychopathic traits are generally associated with low anxiety levels (56).

Show abstract

Comorbidity between schizophrenia and psychopathy has been noted in violent patients in forensic settings. Both disorders are characterized by deficits in processing sad and fearful emotions, but there have been no imaging studies examining the impact of comorbid psychopathic traits on emotional information processing in violent patients with schizophrenia. We tested the hypothesis that violent patients with schizophrenia who had high psychopathy scores would show attenuated amygdala responses to emotional (particularly fearful) faces compared with those with low psychopathy scores.

Twenty-four violent male patients with schizophrenia were categorized as high/low scorers based on the Psychopathy Checklist: Screening Version. Participants underwent functional magnetic resonance imaging during a block-designed implicit face affect processing task. In a region of interest approach, responses in the amygdala and prefrontal cortex were examined with contrasts between sad/fearful/angry/disgusted faces and neutral faces. High psychopathy scorers exhibited reduced blood oxygenation level-dependent (BOLD) responses in the amygdala during exposure to fearful faces. Psychopathy scores, particularly the affective facets, correlated negatively with amygdala responses. The BOLD responses in the orbitofrontal cortex were negatively correlated with the lifestyle and antisocial facets of psychopathy during exposure to sad faces. Psychopathy scores were positively correlated with neural activation in amygdala and inferior prefrontal regions for disgust but negatively correlated for anger.

Patients with schizophrenia and high levels of psychopathic traits appear to have blunted amygdala responses to fearful faces. At a dimensional level,

psychopathy subfacets show a differential relationship to functioning in amygdala-prefrontal circuitry.

\* ### Happy Mouth and Sad Eyes: Scanning Emotional Facial Expressions

2011, Emotion

\* ### Identification of emotional facial expressions: Effects of expression, intensity, and sex on eye gaze

2016, PLoS ONE

\* ### Perceptual and affective mechanisms in facial expression recognition: An integrative review

2016, Cognition and Emotion

\* ### Parsing fear: A reassessment of the evidence for fear deficits in psychopathy

2016, Psychological Bulletin

[View all citing articles on Scopus](#)

[View Abstract](#)

Copyright © 2007 Elsevier Ireland Ltd. All rights reserved.

## Recommended articles

\* ### Facial gender and hemispheric asymmetries: A hf-tRNS study

Brain Stimulation, Volume 10, Issue 6, 2017, pp. 1145-1147

Giulia Prete, ?, Luca Tommasi

[View PDF](#)

\* ### Approximating Shepp's constants for the Slepian process

Statistics & Probability Letters, Volume 153, 2019, pp. 21-31

Jack Noonan, Anatoly Zhigljavsky

[View PDF](#)

\* ### The compassionate vagus: A meta-analysis on the connection between compassion and heart rate variability

Neuroscience & Biobehavioral Reviews, Volume 116, 2020, pp. 21-30

Maria Di Bello, ?, Cristina Ottaviani

[View PDF](#)

\* ### If not fear, then what? A preliminary examination of psychopathic traits and the Fear Enjoyment Hypothesis

Personality and Individual Differences, Volume 90, 2016, pp. 278-282

Ashley M. Hosker-Field, ?, Angela S. Book

[View PDF](#)

\* ### Heart rate and skin conductance associations with physical aggression, psychopathy, antisocial personality disorder and conduct disorder: An updated meta-analysis

Neuroscience & Biobehavioral Reviews, Volume 132, 2022, pp. 553-582

Peter C. de Looff, ?, Henk L.I. Nijman

[View PDF](#)

\* ### Chimiothérapie néoadjuvante dans le cancer de vessie infiltrant le muscle : complications et conséquences sur la réalisation de la cystectomie

Progrès en Urologie, Volume 25, Issue 9, 2015, pp. 555-556

Y. Neuzillet

[View PDF](#)

[Show 3 more articles](#)

## Article Metrics

Citations

\* Citation Indexes: 63

Captures

\* Readers: 105

[View details](#)

\* [About ScienceDirect](#)

\* [Remote access](#)

\* [Shopping cart](#)

\* [Advertise](#)

\* [Contact and support](#)

\* Terms and conditions

\* Privacy policy

Cookies are used by this site. Cookie Settings

All content on this site: Copyright © 2024 Elsevier B.V., its licensors, and contributors. All rights are reserved, including those for text and data mining, AI training, and similar technologies. For all open access content, the Creative Commons licensing terms apply.

## Cookie Preference Center

We use cookies which are necessary to make our site work. We may also use additional cookies to analyse, improve and personalise our content and your digital experience. For more information, see our Cookie Policy and the list of Google Ad-Tech Vendors.

You may choose not to allow some types of cookies. However, blocking some types may impact your experience of our site and the services we are able to offer. See the different category headings below to find out more or change your settings.

Allow all

### Manage Consent Preferences

#### Strictly Necessary Cookies

Always active

These cookies are necessary for the website to function and cannot be switched off in our systems. They are usually only set in response to actions made by you which amount to a request for services, such as setting your privacy preferences, logging in or filling in forms. You can set your browser to block or alert you about these cookies, but some parts of the site will not then work. These cookies do not store any personally identifiable information.

Cookie Details List?

#### Functional Cookies

Functional Cookies

These cookies enable the website to provide enhanced functionality and personalisation. They may be set by us or by third party providers whose services we have added to our pages. If you do not allow these cookies then some or all of these services may not function properly.

Cookie Details List?

#### Performance Cookies

Performance Cookies

These cookies allow us to count visits and traffic sources so we can measure and improve the performance of our site. They help us to know which pages are the most and least popular and see how visitors move around the site.

Cookie Details List?

#### Targeting Cookies

Targeting Cookies

These cookies may be set through our site by our advertising partners. They may be used by those companies to build a profile of your interests and show you relevant adverts on other sites. If you do not allow these cookies, you will experience less targeted advertising.

Cookie Details List?

Back Button

### Cookie List

Search Icon

Filter Icon

Clear

checkbox label label

Apply Cancel

Consent Leg.Interest  
checkbox label label  
checkbox label label  
checkbox label label  
Confirm my choices