



## Remember me? Psychopathic traits and emotional memory in an undergraduate sample

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### ARTICLE INFO

#### Article history:

Received 5 May 2012

Received in revised form 29 September 2012

Accepted 4 October 2012

Available online 31 October 2012

#### Keywords:

Emotional memory  
Facial memory task  
Emotion processing  
Psychopathic traits

### ABSTRACT

We investigated the effects of psychopathy on emotional memory among a predominantly female undergraduate sample. Undergraduates ( $N = 153$ , mean age = 20.1; 80.1% female; 57.1% Caucasian) completed a facial memory task. Participants were presented with a series of faces (sad, scared, angry, happy, neutral), completed a self-report measure of psychopathy, and were presented with another series of faces (with some from the first phase, and some new). Participants were asked whether they recognized each face from the first set, and reaction time (RT) was measured. Although memory for emotional faces did not differ from neutral faces, there were main effects of emotion, gender and psychopathy on RT. A significant 3-way interaction revealed that males who were higher in psychopathy had slower RTs; they were slow to remember sad, angry and neutral faces. In conclusion, psychopathy may affect emotional memory differently across gender. Specifically, undergraduate men, but not women, with higher psychopathy levels may show impaired memory for emotional faces. Implications for future studies of emotional memory and psychopathy are discussed.

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### 1. Introduction

Psychopathy (e.g., Hare, 2003; Cleckley, 1941, 1976) consists of behavioral traits (e.g., criminal versatility, impulsivity), alongside emotional and affective impairments (e.g., lacking empathy). Much attention is paid to the behavioral consequences of psychopathy (e.g., violence and antisocial behavior), with less known about the origins of the emotional deficits in psychopathy. Emotions provide information regarding others' states and intentions, and deficits in emotion processing may preclude psychopathic individuals from understanding social cues. Emotion processing deficits may be of particular importance in understanding psychopathy among community populations. Yet, to date, few studies examine emotion processing and psychopathy within community samples, particularly among women.

#### 1.1. Psychopathy and deficits in emotion processing

Deviant patterns of emotion processing among individuals with psychopathic traits have been found across physiological, neuroimaging, and cognitive tasks, using different measures of emotion processing (e.g., recognition, interpretation, and reactivity). Studies examining electrodermal responses to emotional sounds (Verona,

Patrick, Curtin, Bradley, & Lang, 2004), startle reflex to aversive scenes (Levenston, Patrick, Bradley, & Lang, 2000; Patrick, Bradley, & Lang, 1993), and amygdala responses to emotional faces (Dolan & Fullam, 2009), indicate emotion processing deficits among male inmates and psychiatric patients with psychopathy. Similar deficits are documented in community samples (Benning, Patrick, & Iacono, 2005; Fung et al., 2005; Gordon, Baird, & End, 2004; Justus & Finn, 2007; Reidy, Zeichner, & Foster, 2009; Reidy, Zeichner, Hunnicutt-Ferguson, & Lilienfeld, 2008; Vanman, Mejia, Dawson, Schell, & Raine, 2003).

Cognitive paradigms are another means of assessing emotion processing. Cognitive tasks are non-invasive and less expensive than physiological and neuroimaging paradigms, yet provide insight into neural processes. The lexical decision task (LDT) is one such paradigm, in which a number of letter strings is presented in series on a computer. Participants decide whether each letter string is a word or non-word, and are timed. Most individuals respond more quickly to emotional words than neutral words (e.g., Challis & Krane, 1988), consistent with an emotion-facilitation effect. Higher psychopathy is associated with less emotion-facilitation among male offenders (Lorenz & Newman, 2002; Williamson, Harpur, & Hare, 1991), undergraduate men (e.g., Reidy et al., 2008) and women (Reidy et al., 2009). Specifically, individuals with higher psychopathy do *not* respond more quickly to emotional words. Hence, unlike typical controls, the emotional content of the words does not facilitate processing, suggesting a psychopathy-linked deficit in processing of emotional information.

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Few studies examine psychopathy and emotion processing in female samples, and findings are inconsistent. Reidy and colleagues (2009) showed that among 88 female undergraduates, higher psychopathy was associated with slower responses to sad words after priming with violent images. Controls were expected to respond more quickly to sad words after priming, due to greater activation of an emotional network (indicating sad mood). The authors concluded that psychopathic women were slower to respond to sad words, as this was not a mood-congruent condition for them, suggesting a deviant emotional response (i.e., not sad) in response to the images. Hence, psychopathic women demonstrated abnormalities in emotion processing, suggesting that the association between psychopathy and emotion processing deficits found among males may be generalizable to females.

In contrast, another study of 220 female offenders found that psychopathic women performed comparably to controls on the LDT, showing faster responses to emotional words (Vitale, Maccoon, & Newman, 2011). Given the dearth of literature focusing on women in this area, and the discrepancy in preliminary findings, further research on the effects of psychopathy on emotion processing in females is warranted.

### 1.2. Psychopathy and emotional memory

Within the field of emotion processing, memory for emotional stimuli is of particular interest. It is adaptive to attend preferentially to emotional information; as such, individuals show enhanced memory for emotional versus neutral stimuli (e.g., D'Argembeau & Van der Linden, 2004; Doerksen & Shimamura, 2001; Kensinger, 2004). Neurobiological research demonstrates that personality can account for variance in emotional memory (Hamann & Canli, 2004). Since psychopathy is associated with deficits in emotion processing, psychopathic personality may be associated with impaired emotional memory. However, few studies (Glass & Newman, 2009; Wilson, Demetriooff, & Porter, 2008) have examined the relationship between psychopathy and emotional memory.

The *response modulation hypothesis* (RMH; Newman & Lorenz, 2003) posits that impairments in emotion processing for psychopathic individuals occur only when emotional cues are peripheral to attention. Glass and Newman (2009) found that both psychopathic and nonpsychopathic male offenders showed greater recall of emotional versus neutral words in a memory task. Yet, psychopathic offenders showed *worse* memory for contextual cues (e.g., the color of the box around the word) relating to emotional words than nonpsychopathic offenders, suggesting psychopathic individuals may not create associations between emotional events and contextual cues (Newman & Kosson, 1986; Glass & Newman, 2009).

Recent data suggest that psychopathic individuals could be *more* accurate in their memory for certain emotional stimuli, as compared to controls. Wilson and colleagues (2008) found that high psychopathy male undergraduates showed superior accuracy in recognizing sad, unsuccessful, female (e.g., “vulnerable”) faces, as compared to any other combination of emotion, success level, or gender, and compared to a low psychopathy group. Thus, males with high psychopathy showed enhanced memory for emotional information that was more relevant to a predatory agenda. This may indicate that psychopathy is not associated with deficits in emotion processing altogether. Notably, neither sample included females. As literature in neurobiology suggests that there are gender differences in emotional memory (Hamann & Canli, 2004) this phenomenon may look different in women.

### 1.3. The present study

We examined the relationship between psychopathy and emotion processing in a community sample. To our knowledge, only

one study has looked at psychopathy and emotional memory using an undergraduate sample (i.e., Wilson et al., 2008). Examination of psychopathic traits in the general population is critical, given increasing evidence that psychopathy is a continuous personality construct, with links to important antisocial and risk behaviors in the community (DeMatteo, Heilbrun, & Marczyk, 2005; Edens, Lilienfeld, Marcus, & Poythress, 2006; Hare & Neumann, 2008; Levenson, Kiehl, & Fitzpatrick, 1995; Neumann & Hare, 2008; Salekin, Trobst, & Krioukova, 2001; Wilson, Frick, & Clements, 1999; Coyne & Thomas, 2008; Lee & Salekin, 2010). Such research may clarify whether abnormalities in emotion processing are inherent to psychopathy, or specific to psychopathy at the severe end. Second, female psychopathy has received little attention, so we recruited a predominantly female sample to examine whether deficits in emotion processing are strongly linked to psychopathy among women.

The present study used an emotional memory task to investigate the relationship between psychopathic traits and memory for emotional stimuli in an undergraduate sample. As in prior community studies (e.g., Gordon et al., 2004; Wilson et al., 2008), we used faces as stimuli, to capture processing of others' emotional reactions and cues that are integral to social interactions. To explore within-emotion differences, we included several emotions of negative valence (e.g., fear, anger). In developing hypotheses, we strongly considered the robust associations between psychopathy and deficits in emotion processing. Although newly emerging, we also considered recent findings from the emotional memory studies suggesting some preference for emotional information. Two competing hypotheses were tested:

- (1) Higher psychopathy will be associated with poorer performance in remembering emotional faces.
- (2) Alternatively, higher psychopathy will be associated with better recognition of sad and scared faces compared to other faces. Participants with low psychopathy will not show this effect.

Finally, few studies have investigated the association between psychopathy and emotion processing in females. Drawing on existing work in psychopathy and emotion processing in female undergraduates (i.e., Reidy et al., 2009), and data among neuroimaging and physiological studies of female offenders (Harenski, Kim, & Hamann, 2009; Sutton, Vitale, & Newman, 2002) we posited a third hypothesis:

- (3) Women with higher psychopathy will show comparable deficits in emotional memory to psychopathic men. Specifically, hypotheses 1 and 2 will apply to men *and* women.

## 2. Method

### 2.1. Participants

Participants were 153 undergraduates (124 females, 29 males) recruited through an undergraduate psychology participant pool and fliers posted around the campus. Mean age was 20.1 (SD = 1.3). The sample was ethnically diverse (57.1% Caucasian, 15.4% Asian or Pacific Islander, 9.5% Multiethnic or “Other”, 9% Hispanic, 9% African American/Black). Participants were granted extra credit as an incentive for participation. The University's Human Subjects Review Board approved the study.

### 2.2. Procedure

Data were collected in a quiet laboratory. Participants were tested individually. In phase 1, participants viewed 45 happy,

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