Neuroscience and Biobehavioral Reviews 36 (2012) 2288–2304

Contents lists available at SciVerse ScienceDirect

Neuroscience and Biobehavioral Reviews

journal homepage: www.elsevier.com/locate/neubiorev

Review

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

Amy Dawel[a,*], Richard O'Kearney[a], Elinor McKone[a,b], Romina Palermo[a,b,c]

[a] Department of Psychology (buiding 39), The Australian National University, Canberra, ACT 0200, Australia
[b] ARC Centre of Excellence in Cognition and its Disorders
[c] School of Psychology, University of Western Australia, Crawley, WA 6009, Australia

ARTICLE INFO

Article history:
Received 23 March 2012
Received in revised form 5 July 2012
Accepted 14 August 2012

Keywords:
Psychopathy
Callous unemotional
Antisocial
Face
Voice
Posture
Nonverbal
Expression
Emotion
Amygdala
Meta-analysis

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.

Contents

1. Introduction 2289
   1.1. Factor structure of psychopathy 2289
   1.2. Psychopathic traits in children 2289
   1.3. Neurological basis of emotion recognition deficits 2290
   1.4. Theoretical implications of emotion recognition deficits 2290
   1.5. Emotion recognition deficits: facial expressions 2290
   1.6. Emotion recognition deficits: other modalities 2291
   1.7. The current meta-analysis 2291
2. Methods 2291
   2.1. Inclusion and exclusion criteria 2291
   2.2. Search strategy 2291
   2.3. Data extraction and management 2291
   2.4. Data analysis 2292
      2.4.1. Effect sizes 2292
      2.4.2. General procedure for meta-analyses 2292
      2.4.3. Meta-analysis of emotions 2292
      2.4.4. Meta-analysis of effect size differences 2292
      2.4.5. Moderator analysis 2292
      2.4.6. Publication bias 2292

* Corresponding author. Tel.: +61 2 6125 4106; fax: +61 2 6125 0499.
E-mail addresses: amy.dawel@anu.edu.au (A. Dawel), richard.okearney@anu.edu.au (R. O'Kearney), elinor.mckone@anu.edu.au (E. McKone), romina.palermo@uwa.edu.au (R. Palermo).

0149-7634/$ – see front matter © 2012 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.neubiorev.2012.08.006

2.4.7. Alpha level ... 2292
3. Results ... 2292
3.1. Description of studies ... 2292
3.1.1. Included studies ... 2292
3.1.2. Population characteristics ... 2294
3.1.3. Measurement of psychopathy ... 2294
3.1.4. Measurement of the affective factor of psychopathy ... 2294
3.1.5. Stimuli and task variables ... 2294
3.2. Meta-analysis of emotions for total psychopathy ... 2294
3.2.1. Facial cue deficits in total psychopathy ... 2294
3.2.2. Can fixed-effects modeling explain differences between our results and those of Wilson et al. (2011) for facial cues? ... 2297
3.2.3. Vocal cue deficits in total psychopathy ... 2297
3.3. Single-studies not included in meta-analysis for total psychopathy ... 2298
3.3.1. Facial cue deficits in CU traits ... 2298
3.3.2. Postural cue deficits in CU traits ... 2298
3.4. Meta-analysis for the affective factor of psychopathy ... 2298
3.4.1. Multi-modal deficits in the affective factor of psychopathy ... 2298
3.5. Meta-analysis by age group for facial cues for total psychopathy ... 2299
3.5.1. Subgroup meta-analysis for adults ... 2299
3.5.2. Subgroup meta-analysis for children/adolescents ... 2299
3.6. Moderation analysis for task difficulty for total psychopathy ... 2299
3.7. Homogeneity tests ... 2299
3.8. Publication bias ... 2299
4. Discussion ... 2299
4.1. Neurological implications ... 2300
4.2. Neurobehavioural and theoretical implications ... 2301
4.3. Clinical implications ... 2301
4.4. Influence of other variables and limitations of available data ... 2301
4.5. Statistical power ... 2302
5. Conclusion ... 2302
Acknowledgements ... 2302
Appendix A. Supplementary data ... 2302
References ... 2303

1. Introduction

Psychopathy is a severe and chronic personality disorder, characterized by poor empathy, with a prevalence of approximately 1% of the general population (Hare, 2003). Psychopathic traits are associated with increased criminality within antisocial populations (Leistico et al., 2008), and increased rates of violent behaviour, suicide attempts and homelessness within the general population (Coid et al., 2009). Thus psychopathy has considerable social and economic costs for the individual and society. Unfortunately, however, there is limited evidence of effective treatment of psychopathy (Salekin et al., 2010). Improving our understanding of the aetiology of this disorder is vital for developing more effective treatments.

Developmental models of psychopathy implicate abnormal cognitive and neurological functioning in the affective impairments associated with this disorder (e.g., Frick and White, 2008). Psychopathy has, for example, been linked with deficits in recognizing emotions from nonverbal cues, including facial (e.g., Blair et al., 2001a, 2004) and vocal cues (e.g., Stevens et al., 2001; Blair et al., 2002). Yet the literature is currently unclear as to whether deficits are specific to some emotions and whether they are pervasive across modalities. This has important theoretical implications, as at least one prominent theory (Blair, 1995, 2006) argues that a *specific* deficit in recognizing others' distress (expressions of fear and sadness) contributes to the development of psychopathy. The main purpose of this review therefore was to quantitatively evaluate impairments in emotion recognition in psychopathy.

1.1. Factor structure of psychopathy

A complicating issue relevant to this review is that psychopathy is generally accepted to be comprised of two main factors, which in all likelihood have different aetiologies (e.g., Harpur et al., 1989). The first factor is characterized by impaired affective and interpersonal functioning (e.g., poor empathy, lack of guilt and remorse, callousness), whilst the second factor consists of antisocial behaviour. It is the first, affective factor that uniquely distinguishes psychopathy from other antisocial behaviour. The affective factor has been measured as a component of psychopathy scales in adults (e.g., PCL-R; Hare, 2003) and children/adolescents (e.g., APSD; Frick and Hare, 2001), and in isolation as callous unemotional (CU) traits (e.g., ICU; Essau et al., 2006), which is arguably the key component of the affective psychopathy factor (e.g., Frick and White, 2008; although others argue impulsivity is also critical to psychopathy e.g., Hart and Dempster, 1997).

Two previous meta-analyses of emotion recognition in psychopathy (Marsh and Blair, 2008; Wilson et al., 2011) have considered both dimensions of psychopathy together. Given the likely differences in aetiology, however, it is possible the two factors may be associated with different impairments in emotion recognition. Thus in the current meta-analysis we attempted to separate out the affective factor of psychopathy and investigate its relationship to emotion recognition.

1.2. Psychopathic traits in children

Around half of the studies investigating emotion recognition deficits associated with psychopathic traits have used child/adolescent samples. In older children/adolescents, measures of adult psychopathy that are adapted for use with children are frequently used (Lynam and Gudonis, 2005). Alternatively, CU traits have been measured as a proxy for the affective factor of psychopathy from as early as 3 years of age (Hawes et al., 2011). CU traits have a strong genetic basis (e.g., Viding et al., 2005), uniquely