Characterising emotion processing, fear and anxiety in mentally disordered offenders

Aisling Parsons

Submitted for the degree of

Doctor of Psychology
(Clinical Psychology)

School of Psychology
Faculty of Arts and Human Sciences
University of Surrey
Guildford, Surrey
United Kingdom
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Abstract

The aim of the present study was to explore emotion processing, fear and anxiety in mentally disordered offenders while controlling for psychopathy. Patient participants were thirty-seven male mentally disordered offenders from a high-secure hospital who had a history of violent offending. Controls were twenty-seven male staff from the hospital. Participants completed the Emotion Perception Task (EPT), a task of emotion recognition and discrimination in intensity of facial affect. Participants also completed the Joystick Operated Runway Task (JORT), a measure of fear and anxiety. Patients’ level of psychopathy was measured using the Psychopathy Checklist Revised (PCL-R). Significant differences were found between patients and controls for overall discrimination of facial affect intensity and for fear and anger individually. Patients with schizophrenia alone performed significantly worse than both patients with personality disorder (PD) alone and patients with comorbid schizophrenia and PD for emotion discrimination. The study found no differences between patients and controls for emotion recognition, induced fear or anxiety. These findings have important theoretical implications for how emotion processing deficits among individuals with schizophrenia are understood in the context of models of violent offending that do not account for defensive violence. Clinical interventions that focus on improving emotion perception accuracy may contribute to a reduction this type of violent re-offending. Recommendations for future research are discussed.
Acknowledgments

I would like to thank the PsychD Course Team at the University of Surrey for giving me the opportunity to complete my clinical training on this excellent programme. I have enjoyed the challenge of training and am grateful for the variety of clinical placements that I was fortunate to experience. Over the last three years I have developed my clinical skills and feel ready to embark on a career as a qualified clinical psychologist in October 2015. I would especially like to thank my placement supervisors Dr. Rosalie Hughes, Dr. Victoria Hill, Dr. Howard Greensmith, Dr. Jane Iles, Dr. Julie Nixon and Dr. Ndidi Ebubedike for giving me expert supervision and helping me develop into the clinical psychologist that I am today. Also, I would especially like to thank Dr. Nan Holmes and Dr. Simon Draycott, my clinical tutors, for supporting and guiding me through the clinical training process.

Regarding the research, I would especially like to thank Dr. Emily Glorney and Dr. Susan Young, my supervisors, for their expert supervision, practical advice, and continuous encouragement throughout the entire process of the research. I would also like to thank Dr. Kate Gleeson, Dr. Sue Jackson and Professor Gisli Gudjonsson for their guidance and support throughout the process. Added to this, I would like to thank Professor Veena Kumari for her expert role in the design and development of the wider study. I wish to thank each and every participant who gave their time for this research. I also wish to thank staff at the high-secure hospital where this research was conducted for their support and assistance in helping to co-ordinate participation in this study. I want to particularly acknowledge Ms. Ottilie Sedgwick, my partner in research. This project would not have been possible without collaborating with her on the larger study that is currently being conducted at the hospital. Two placement
students, Jack Arnold and Ben Greer, and Vicky Gombya, were invaluable in the running of the wider project and in turn were invaluable to me achieving this work in the restricted time frame that I had. I would like to thank Stephen, my partner, for supporting me and having limitless belief in my ability. I would also like to thank my family and friends for their reassurance that this project could be achieved. Finally, I would like to thank the University of Surrey, the high-secure hospital and the Mental Health Trust for supporting this research.
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Introductory section

The MRP literature review, MRP research proposal and MRP empirical paper presented in this MRP research portfolio are all part of the original research proposed at the outset of doctoral training programme. The present study forms part of a larger research project currently being conducted at a high-secure hospital in the South of England. The larger study has received a favourable ethical opinion from the NHS NRES committee (REC reference: 14/LO/0238; IRAS project ID: 98463; see appendix A).

The larger project is entitled: ‘Characterisation of, and prediction of clinical outcomes in, mentally disordered offenders’. This larger project uses an extensive battery of standardised tests and measures in order to determine the cognitive and emotional profile of mentally disordered offenders at a specialist high-secure psychiatric hospital who have been detained under the Mental Health Act because of their mental illness and their risk to others. The larger research project aims to investigate whether patients with schizophrenia, personality disorder (PD) or comorbid diagnosis of schizophrenia and PD are characterised by different emotional and cognitive deficit profiles. It also aims to explore which features of these patient groups are associated with better clinical outcomes following treatments that are currently offered.

The present study aimed to characterise the processing of emotion and the experience of fear and anxiety in mentally disordered offenders, while controlling for levels of psychopathy. The present study also aimed to determine the nature and extent of any differences between how mentally disordered offenders process emotion or experience fear and anxiety when compared to controls. Previous
research has reported that individuals with psychological disorders such as personality disorder (PD), psychosis and/or psychopathy exhibit emotion processing deficits. Individuals with a history of violent offending have also reportedly demonstrated similar deficits. However little research to date has explored the relationship between psychopathy and emotion processing among mentally disordered offenders.

All tasks and measures used in the present study received a favourable ethical opinion from the NHS NRES committee within the application that was submitted for the larger research study as detailed above. The present study also received a favourable ethical opinion from the University of Surrey (see appendix B).

Between May 2013 and February 2015, an average of one day per week was spent at the high secure hospital engaging in a range of relevant tasks including preparing ethics applications for the larger study, training up on standardized tasks and measures, recruiting participants, attending meetings with professionals on site to promote the research study, data collecting, inputting and analysis. Personally I collected half of all the comparison group sample data and informed consent. For the patient group, one consent form was signed for participation in the wider study which included consent to participate in the present in a standalone informed consent session. I completed thirteen out of thirty-seven informed consent sessions and therefore personally obtained consent from thirteen patients prior to participation in the present study. The remaining consent was obtained by the lead researcher on the wider study. I was involved in at least one data collection session out of four with all patients who participated. All data for the tests and measures used in the present study was personally analysed using the SPSS statistical package.
MRP empirical paper
Characterising emotion processing, fear and anxiety in mentally disordered offenders

By

Aisling Parsons

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School of Psychology

Faculty of Arts and Human Sciences

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Statement of journal choice

_Psychiatry Research_ is the journal that has been identified as the preferred journal to submit this MRP empirical paper to for publication (see appendix C for author guidelines). This particular journal has been chosen for a number of reasons. Firstly, it has an impact factor of 2.68 and means that this review would be in a journal that is likely to be disseminated to a wide readership. Also, the topics covered in this journal match the topic of this current literature review.
Acknowledgements

I would especially like to thank Dr. Emily Glorney and Dr. Susan Young, my supervisors, for their expert supervision, practical advice, and continuous encouragement throughout the entire process of the research. I would also like to thank Dr. Kate Gleeson, Dr. Sue Jackson and Professor Gisli Gudjonsson for their guidance and support throughout the process. Added to this, I would like to thank Professor Veena Kumari for her expert role in the design and development of the wider study. I wish to thank each and every participant who gave their time for this research. I also wish to thank staff at the high-secure hospital where this research was conducted for their support and assistance in helping to co-ordinate participation in this study. I want to particularly acknowledge Ms. Ottilie Sedgwick, my partner in research. This project would not have been possible without collaborating with her on the larger study that is currently being conducted at the hospital. Two placement students, Jack Arnold and Ben Greer, and Vicky Gombya, were invaluable in the running of the wider project and in turn were invaluable to me achieving this work in the restricted time frame that I had. I would like to thank Stephen, my partner, for supporting me and having limitless belief in my ability. I would also like to thank my family and friends for their reassurance that this project could be achieved. Finally, I would like to thank the University of Surrey, the high-secure hospital and the Health Trust for supporting this research.
1. Introduction

Violent behaviour has a high cost to society, is prevalent in the United Kingdom and across the world, and impacts many sectors of the economy including legal and healthcare (Department of Health, 2012). Multiple theoretical positions offer explanations for violent behaviour and contribute to the development of appropriate strategies for intervention with violence. Three of the most well-known models that have been used to understand aggression and violent behaviour are Crick & Dodge’s (1994; as cited in Arsenio & Lemerise, 2004) social information processing model, Kohlberg’s (1969, 1984; as cited in Lindsay et al., 2011) six-stage cognitive development model of moral reasoning, and Turiel’s (1983; as cited in Arsenio & Lemerise, 2004) domain model of moral development. Kohlberg’s (1969, 1984) model has been later revised by Gibbs, Basinger and Fuller (1992) to include a reduced number of stages and is considered to measure moral judgement competence (Van Vugt et al., 2011).

These models pay particular attention to how children’s social cognition in the way that they misinterpret and misunderstand the behaviour and intentions of others is linked to their behaviour which may develop into long-term patterns of aggressive behaviour (Arsenio & Lemerise, 2004). They discuss how the development of criminal behaviour such as theft or violence emerges from the combination of an individual’s poor social perspective taking along with the desire to meet one’s own needs (Lindsay, 2011). The models are primarily focused on the intentional aggression and violence (Arsenio & Lemerise, 2004). The social information processing theory has been widely cited in determining the factors that explain violence and aggression (Lansford, 2006).
One characteristic thought to underlie violent behaviour is dysfunction in the processing of emotion (Blair, 1995). A behavioural model of violent offending (Blair, 1995) suggests that the propensity to commit a violent act may be explained by the violence inhibition mechanism (VIM) model. This model proposes that a deficit in emotion perception is related to violent behaviour, particularly repeated violent behaviour. Indeed, deficits in emotion recognition have been found among prisoners with a history of violent offending (Robinson et al., 2012; Seidel et al., 2013). Specifically, the VIM model proposes that when individuals inflict violence on another person, the recognition of the victim’s distress in the form of a fearful or sad facial expression triggers the VIM (Blair, 1995). As the victim’s distress is paired with the VIM, individuals are then less likely to repeat violence on others (Herba et al., 2006). For individuals without psychopathy, the victim’s distress response acts as a ‘punishment’ for violence. However for individuals with psychopathy, it is hypothesized that the VIM is disrupted, that they do not process a victim’s distress response and can therefore go on to inflict violence on others repeatedly (Herba et al., 2006). This absence of a ‘punishment’ or aversive reaction from the victim to violent behaviour may then lead to repeated violent or anti-social behaviour, particularly for individuals with psychopathy (Blair and Coles, 2000).

Psychopathy may be characterized as a personality disorder that is severe in nature and comprises antisocial behaviour impairments in relation to empathy (Hare, 2003). Although psychopathy has mostly been associated with poor recognition of fearful and sad facial emotions, a recent meta-analysis shows poor recognition of positive emotions, namely happiness and surprise, as well in association with psychopathy (Dawel, O’Kearney, McKone, and Palermo, 2012). Psychopathy is also
characterized by anti-social behaviour and empirical studies have reported a significant contribution of psychopathy to emotion processing deficits among violent offenders for facial emotion processing (Munro et al., 2007), vocal affect recognition (Bagley, Abramowitz, and Kosson, 2009) and emotion word processing (Lorenz and Newman, 2009). However, one study found no psychopathy-related deficits for facial affect recognition across angry, fearful, sad or happy facial expressions in a sample of violent offenders who were divided into high- and low-psychopathy groups (Glass & Newman, 2006). However, it must be noted that these studies specifically excluded participants who had a history of any pervasive psychological disorder such as schizophrenia.

Violence and aggression are thought to be underpinned by emotion regulation deficits at a neural level (Davidson, Putman, and Larson, 2000). These deficits, located in areas of the brain linked with self-reference, self-reflection and emotion recognition of others (Bertsch et al., 2013), are characteristic features of some psychological disorders such as schizophrenia, antisocial personality disorder (ASPD) and the construct of psychopathy. Empirical research has found differences in brain activation for processing emotional stimuli between violent and non-violent offenders with schizophrenia (Kumari et al., 2009). Furthermore, empirical research has found that psychopathic offenders display significantly less activation in brain regions related to emotion compared to both non-psychopathic offenders and non-psychopathic, non-offending controls (Kiehl et al., 2001).

Elevated levels of psychopathy have been reported among mentally disordered offenders, with a comorbid prevalence associated with bipolar disorder, antisocial personality disorder (ASPD) and substance use disorder. The comorbidity of
psychopathy and depression is less prevalent (Soderstrom, Nilsson, Sjodin, Carlstedt, and Forsman, 2005). Empirical research studies have highlighted significant co-morbidity between psychotic disorders (particularly schizophrenia) and psychopathy within forensic samples and suggest that it is unlikely that Axis I and Axis II disorders occur independently (Blackburn, Logan, Donnelly and Renwick, 2003). Despite the high prevalence of schizophrenia and ASPD among offenders, the majority of studies investigating the role of psychopathy in relation to the processing of emotional stimuli have excluded offenders with a psychological comorbidity such as bipolar disorder, psychosis or schizophrenia (eg. Baskin-Sommers, Wallace, MacCoon, Curtin and Newman, 2010; Kiehl et al., 2001) and a history of any other personality disorder (eg. Lake, Baskin-Sommers, Li, Curtin, and Newman, 2001; Newman, Curtin, Bertsch and Baskin-Sommers, 2010). Some studies have failed to specify whether participants were excluded on the basis of a documented history of a psychological disorder (eg. Lorenz and Newman, 2002). Sadeh and Verona (2012) claim that the presence of co-morbid diagnoses such as psychosis or bipolar disorder among offenders may exaggerate the level of psychopathy recorded. It is possible that the majority of current research that only includes samples of violent offenders without psychological comorbidity may be misrepresentative of the violent offending population given the reported elevated prevalence of psychological disorders among samples of offenders (Blackburn et al., 2003).

There is a wealth of research investigating the contribution of psychopathy to the processing of emotional stimuli among offenders but this, as mentioned earlier, has largely excluded offenders with comorbid psychological disorders, despite the suggestion that Axis I and Axis II disorders are unlikely to occur independently
(Blackburn et al., 2003). Added to this, research has also shown that emotion processing is impaired among individuals with co-morbid psychological disorders (Kohler, Walker, Martin, Healey, and Moberg, 2010). A meta-analytic review of 59 studies highlighted significant impairment in negative facial emotion recognition among individuals with schizophrenia compared to controls, and cited a large effect size (Kohler et al., 2010). This meta-analysis also found that individuals with schizophrenia exhibited significant deficits for discrimination between facial emotions when the results of 27 studies were analysed (Kohler et al., 2010). Hooker & Park (2002) also report emotion processing deficits in both affective word recognition and facial recognition among individuals with schizophrenia compared to controls.

According to community research studies, a higher level of violent crime is likely to be carried out by individuals who have psychological disorders compared to individuals who do not have psychological disorders (Elbogen and Johnson, 2009). However, severe mental illness does not predict future violent behaviour alone and is only significantly linked with violent crime when comorbid with substance misuse disorder (Elbogen and Johnson, 2009). Research has also suggested that individuals with schizophrenia and other types of psychotic disorders are more likely to commit violent crimes compared to individuals with other types of psychological disorders (Eronen, Angermeyer & Schulze, 1998). Empirical research has also shown that offenders with psychological disorders, without psychopathy, have been shown to differ significantly from non-offending controls on measures of emotional arousal using psychophysiological measures (skin conductance response) relating to
emotional visual stimuli (Wahlund, Sorman, Gavazzeni, Fischer, & Kristiansson, 2010).

There has been little research to date that has explored the role of psychopathy on emotion processing among mentally disordered offenders. In the context of the prevalence of comorbidity of psychopathy and psychological disorders, it would be pertinent to evaluate knowledge of whether the role of psychopathy or psychological disorder has a greater or lesser impact than the other on emotion processing. Comparisons between the emotion processing of offenders with psychopathy and offenders with other psychological disorders would also be useful to explore.

A review of the available literature was carried out to determine how psychopathy is related to deficits in emotion processing among mentally disordered offenders. It focused on findings from studies of mentally disordered offenders with and without psychopathy and investigated the extent psychopathy is related to deficits in emotion processing within samples of mentally disordered offenders. Eight studies were identified that examined the relationship between psychopathy and emotional processing among mentally disordered offenders. Specifically, seven of the studies focused on the relationship between psychopathy and other types of personality disorder for emotion processing (Anton et al., 2012; Dollan & Fullam, 2005, 2006; Domes, Mense, Vohs, & Habermeyer, 2012; Herpertz et al., 2001; Kosson, Lorenz, & Newman, 2006; Verona, Sprague, & Sadeh, 2012). Only one study used a sample of offenders with another psychological disorder, schizophrenia, to explore the mediating role of psychopathy for emotion processing among offenders (Fullam & Dolan, 2006). Most studies reported a significant contribution of psychopathy, independent of other psychological or personality disorders, for
emotion processing deficits among offenders. This review highlighted the lack of research in this area and further recommends future research to be conducted to clarify the relationship between psychopathy and emotion processing deficits among mentally disordered offenders.

In addition to the documentation of deficits in emotion processing among violent offenders, research has also reported that offenders differ in how they experience fear states compared to controls. This difference theoretically leads to offending behaviour as no punishment response is experienced (Herpertz & Sass, 2000). A deficient fear response has also been shown with offenders with high levels of psychopathy compared to offenders without high levels of psychopathy (Blair et al., 2004). A reduced experience of fear has been found in mentally disordered offenders viewing aversive images compared to healthy non-criminal controls (Wahlund et al., 2010). However, among mentally disordered offenders, research has suggested that individuals with particular psychological disorders may experience fear differently. For example, Kumari et al. (2009) found that mentally disordered offenders diagnosed with personality disorder exhibited a reduced fear response whereas mentally disordered offenders whose primary diagnosis was schizophrenia showed an increased fear response to anticipated threat.

Although related to the concept of fear, anxiety is reportedly a neurobiologically distinct mechanism and is characterised as a pervasive mood state elicited in response to a distal and/or potential threat, in contrast to imminent danger as in fear (Davis, Walker, Miles, & Grillon, 2010). However some investigators argue that fear and anxiety are indistinguishable from each other (Steimer, 2002). The available literature regarding deficient anxiety responding in relation to offending is mixed in
its findings. Some research has found a lack of anxiety significantly related to psychoticism (Heym & Lawrence, 2010) whereas Kumari et al. (2009) have shown excessive anticipatory anxiety in a group of schizophrenia patients with a history of serious violence, suggesting this may not be a global deficit in all offenders.

### 1.2 The present study

The principal aim of this present study was to characterise the processing of emotion and the experience of fear and anxiety in mentally disordered offenders, while controlling for levels of psychopathy. The present study also aimed to determine the nature and extent of any differences between how mentally disordered offenders process emotion or experience fear and anxiety when compared to a comparison group of staff working at the high secure hospital with no reported history of violent crime or mental health problems. Previous research has reported that individuals with psychological disorders such as personality disorder (PD), psychosis and/or psychopathy exhibit emotion processing deficits. Individuals with a history of violent offending have also reportedly demonstrated similar deficits. However little research to date has explored the relationship between psychopathy and emotion processing among mentally disordered offenders.

#### 1.2.1 Research questions

1. Is there a difference in emotion processing between mentally disordered offenders with a history of violent crime and a comparison group?
2. Is there a difference in induced fear between mentally disordered offenders with a history of violent crime and a comparison group?
3. Is there a difference in induced anxiety between mentally disordered offenders with a history of violent crime and a comparison group?
4. Are these differences independent of level of psychopathy or intellectual ability?

1.2.2 Main hypotheses

1. There will be impaired processing of negative emotions in mentally disordered offenders with a history of violent crime compared to a comparison group.

2. There will be impaired fear in mentally disordered offenders with a history of violent crime compared to a comparison group.

3. There will be a difference in induced anxiety between mentally disordered offenders with a history of violent crime and a comparison group, although the direction of this is unclear and thus this investigation will be exploratory.
2. Method

2.1 Design

A cross-sectional design was employed to investigate differences between mentally disordered offenders at a high secure hospital and a comparison group. Statistical analyses included between groups comparisons to determine differences between the groups and correlational design to explore the relationships between psychopathy, IQ, emotion processing, fear and anxiety for each of the groups.

2.2 Participants

Participants in the present study consisted of a sample of mentally disordered offenders at a high secure hospital (patient group: n = 37) and a comparison sample of staff working at the same high secure hospital (control group: n = 27). All participants were male. The comparison group were staff from the following sectors: security/escorts (n = 10), health care assistants/nurses (n = 7), clerical/admin (n = 4), and services (n = 6).

2.2.1 Patient group inclusion and exclusion criteria

Patients at the high secure hospital with a history of violent crime were eligible to participate in the current research based on clinical and forensic records and included criminal convictions and judgments on non-responsibility due to mental illness or diminished responsibility. All patient participants had a history of violent offending and were detained under the Mental Health Act 1983 (as amended in 2007). Violent crimes were defined as offences that caused physical harm, threats of violence or harassment, all types of sexual aggression, illegal possession of firearms or explosives, all types of forcible confinement, arson and robbery. Patients were
included in the current study subject to having normal or corrected eyesight and a sufficient command of the English language to complete tasks. Patients were also only included subject to their Responsible Clinician reporting that they met the inclusion criteria and were suitable to be approached. Patients were excluded from participation if they had a history of head injury or posed a significant risk of violence to the researcher. A patient’s capacity to consent to take part was assessed by the researchers taking informed consent prior to taking part. Patients were detained under the follow sections: Section 37/41 (n = 11), Section 38 (n = 1), Section 45A (n = 2), Section 47/49 (n = 17), Section 48/49 (n = 4), Notional Section 37 (n = 2).

2.2.2 Comparison group inclusion and exclusion criteria

All members of staff at the high secure hospital were eligible to participate in the current study except for clinicians (eg. Consultant Psychiatrists, Psychologists). Any staff member that had a self reported history of mental illness or history of violence was excluded from participating the current study. Current psychiatric disorder or current substance abuse was also an exclusion criterion for participation for control participants. The SCID-II (non-patient version) was used to rule out history of significant mental health problems on the basis of self-report.

2.2.3 Participant characteristics

Information was obtained about patients’ primary psychiatric diagnosis. Comorbid diagnoses, where applicable, were also recorded. Demographic information was gathered from each participant in relation to age and ethnicity (see Table 1 below). The distribution of age met the assumptions of normality according
to the results of the Kolmogorov-Smirnov statistic so therefore an independent t-test was conducted to determine whether there were any differences between the groups for age.

Table 1

Summary demographic information of participants

<table>
<thead>
<tr>
<th></th>
<th>Patient group&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Comparison group&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Statistic&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD) years</td>
<td>M (SD) years</td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>37.46 (8.66)</td>
<td>37.89 (10.28)</td>
<td>( t = -.181 )</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>( p = .857 )</td>
</tr>
<tr>
<td><strong>Ethnicity (n, %)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White British</td>
<td>19 (51.4%)</td>
<td>26 (93.6%)</td>
<td>-</td>
</tr>
<tr>
<td>Black British</td>
<td>6 (16.2%)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Asian British</td>
<td>1 (2.7%)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Mixed heritage</td>
<td>2 (5.4%)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Black Caribbean</td>
<td>7 (18.9%)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Black African</td>
<td>1 (2.7%)</td>
<td>1 (3.7%)</td>
<td></td>
</tr>
<tr>
<td>White European</td>
<td>1 (2.7%)</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> \( n = 37 \). <sup>b</sup> \( n = 27 \). <sup>c</sup> df = 62.

* \( p = < .05 \). ** \( p < .01 \). *** \( p < .001 \)

There was no significant difference found for age between the groups (\( t (63) = -.181, p = .857 \)). The groups were not matched for ethnicity. The majority of participants in the control group were White British (93.6%) compared to only 51.4% (\( n = 19 \)) in the patient group. The remaining participants in the patient group reported a wide range of other ethnicities.

Patient participants’ primary diagnosis and primary index offence was recorded. Index offences included the following: Murder (\( n = 8 \)), Manslaughter (\( n = 4 \)), GBH/ABH (\( n = 13 \)), Violent Rape (\( n = 7 \)), Robbery (\( n = 2 \)), Arson (\( n = 2 \)) and
Indecent Assault against a child \( (n = 1) \). The patient group was subsequently sub-divided into three categories: patients with schizophrenia (or schizoaffective disorder) alone \( (n = 11) \), patients with a personality disorder alone \( (n = 13) \) and patients with both schizophrenia and personality disorder \( (n = 13) \). Their offence type (reactive/impulsive (defensive), reactive/impulsive (irritable), or predatory/instrumental) was also recorded. A one-way analysis of variance (ANOVA) was carried out to determine whether there was any difference between the groups for age (see Table 2 below).

**Table 2**

*Summary of patients’ primary diagnosis group and a comparison group by age (in years)*

<table>
<thead>
<tr>
<th>Age/Offense type</th>
<th>Schizophrenia alone(^a) ( M (SD) )</th>
<th>Personality Disorder alone(^b) ( M (SD) )</th>
<th>Comorbid ( M (SD) )</th>
<th>Comparison group(^b) ( M (SD) )</th>
<th>Statistic</th>
<th>( p ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>39.36 ( (9.36) )</td>
<td>38.15 ( (8.38) )</td>
<td>35.15</td>
<td>37.89 ( (10.28) )</td>
<td>( f = -0.443 )</td>
<td>( p = .723 )</td>
</tr>
<tr>
<td>Reactive/impulsive (defensive)</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Reactive/impulsive (irritable)</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Predatory/instrumental</td>
<td>4</td>
<td>9</td>
<td>6</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

\(^a n = 11. \ ^b n = 13. \ ^c n = 13. \ ^d n = 27\)

\* \( p < .05. \ ** \( p < .01. \ *** p < .001 \)
No significant difference was found between the groups for age ($F(3, 60) = .443, p = .723$).

2.3 Materials

A range of standardized measures and tasks were used in the present study. A measure of psychopathy was only taken for the patient group. All other items were completed by both the groups.

2.3.1 Laboratory and emotion perception tasks

2.3.2 Emotion Perception Task (EPT)

The Emotion Perception Task (EPT) is a facial emotion recognition task and consisted of two parts. Part one comprised of a series of standard facial affect photographs presented to participants via a laptop computer, a modified version of the task used by (Premkumar et al., 2008). The faces were digitally manipulated to show happy, sad, angry, fearful or neutral expressions at 50% or 100% intensity. There were sixty trials. The images appeared in a predetermined randomised sequence and consisted of both male and female faces. On each of the sixty trials, participants were required to select the emotion they considered was displayed in the face from a menu of five possible choices (happy, sad, angry, fearful, or neutral). The experimenter recorded their responses.

In part two of the EPT, participants were shown a series of two faces presented side-by-side displaying differing intensity of emotion across sixty-four trials. Facial emotions differed from each other by 25%, 50%, 75% or 100% intensity and were either happy, sad, angry, fearful or neutral at these varying intensities. Faces were paired with another face displaying the same emotion at a different intensity or
compared with a neutral face. Participants were required to choose which face was showing the more intense emotion as quickly and as accurately as they could. Choices made by the participants were recorded in terms of accuracy and response time by the computer programme.

2.3.3 Joystick Operated Runway Task (JORT)

The Joystick Operated Runway Task (JORT) has been shown to be a reliable probe of both fear and anxiety differentiation (Perkins et al., 2009). Stimuli are presented to participants on a standard PC computer screen using a specialized computer programme (PS-JS1, Psyal, London, UK; Perkins, 2009). Participants sit on a seat connected to a joystick that senses force (PH-JS1, Psyal, London, UK; Perkins, 2009). Participants are also required to wear standard headphones. Before completing the task, participants’ maximum strength is assessed across five trials and measures how hard participants can push the joystick. A photo of the apparatus is not possible as photographs are not permitted to be taken inside the high-secure hospital.

The task consists of four conditions. The first consists of a cursor dot being pursued along an on-screen runway with no threat if caught. Condition two comprises a cursor dot being pursued along an on-screen runway by a threat stimulus dot with the added threat that the participant will experience an unpleasant but harmless 115 db burst of white noise the cursor dot is caught by the threat dot. Participants control the speed of the cursor along the runway using a custom made force-sensitive joystick that relates effort to speed in a naturalistic manner: the harder the joystick is pushed the faster the cursor travels along the runway. Importantly, participants must use considerable effort in order to reach escape velocity. Each trial requires participants to use at least 50% of their maximum strength, which is
recorded in a preliminary calibration phase. This means that the JORT is able to model under controlled conditions the high calorie cost of high speed escape from threat.

In condition three and four of the JORT, a second threat stimulus dot appears in front of the cursor, along with the other threat stimulus dot that chases the cursor. This traps the participant in conflict where they must approach threat while moving away from threat. The participant is either threatened or not threatened with an unpleasant but harmless 115 db burst of white noise if the cursor dot is caught by either of the threat dots. The task elicits fear (the need to flee away from the target as fast as possible to avoid an unpleasant stimulus) and is measured as the difference between the velocity in the threat versus no threat condition. It also measures anxiety (a conflict about whether or not to approach the target to avoid an unpleasant stimulus) and is measured as the difference between the degree of approach-withdrawal oscillation across threat versus no threat conditions.

Previous research has demonstrated that performance on the JORT is significantly positively correlated with self-reported fear and anxiety (Perkins et al., 2009). This suggests support for construct validity of the task (Perkins et al., 2009).

2.3.4 Standardised measures

2.3.5 Wechsler Test of Adult Reading (WTAR)

The Wechsler Test of Adult Reading (WTAR; Wechsler, 2001) is a cognitive assessment tool that provides an estimate of an individual’s premorbid intelligence. It has been shown to be a reliable estimation of individuals’ intelligence before the onset of injury or illness (Dykiert & Deary, 2013). It consists of a list of 50
irregularly spelled words and participants are required to attempt to correctly pronounce each word on the list. It has also been shown to correlate highly with verbal intelligence (Green et al., 2008). Research has also found that WTAR demonstrates high test-retest reliability, reliability coefficient .97, among individuals with traumatic brain injury throughout their recovery (Green et al., 2008). This suggests that it may also be a useful measure of premorbid IQ among mentally disordered offenders whose illness can fluctuate over time.

2.3.6 Wechsler Adult Intelligence Scale (WAIS-IV)

The Wechsler Adult Intelligence Scale 4th Edition (WAIS-IV; Wechsler, 2008) is a well validated and widely used measure of estimated current intelligence. Due to the fact that participants in this research study were required to complete an extended battery of tests and measures as part of a larger research study, it was decided to only administer two subsets of the WAIS-IV, vocabulary and matrix reasoning in order to minimise fatigue while still obtaining an estimate of participants’ general cognitive functioning. The Vocabulary and Matrix Reasoning subtests of the WAIS-IV have been shown to have high loading on the $g$ factor of general intelligence with correlations of .73 and .69 respectively (Weiss, Keith, Zhu & Chen, 2013). The WAIS-IV is the standard psychometric test used for neuropsychological testing at the high-secure hospital. In the interest of consistency, it was decided to use the subtests from the WAIS-IV instead of the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999). Participants’ who requested the results of their participation in the present study to be shared with their clinical team would then have test scores in line with the standard battery of tests completed at the high secure hospital.
2.3.7 Psychopathy Checklist Revised (PCL-R)

The Psychopathy Checklist Revised (PCL-R; Hare, 2003) was applied to the patient group only. The PCL-R is a measure of psychopathy constructed around two factors: interpersonal and affective (factor 1) and impulsive lifestyle and anti-social behaviour (factor 2) and demonstrates internal reliability of .87 and .92 respectively among forensic samples. The Psychopathy Checklist Revised (PCL-R) is recommended for use in forensic research settings (Hart, Cox & Hare, 1995). It provides a total score that can be used as a continuous variable. Patient’s previously recorded PCL-R scores \( n = 13 \) were taken from a review of their file and had been fully conducted by a member of the patient’s clinical team. Qualified members of the research team completed PCL-Rs for any patients who did not have an existing PCL-R completed based on a review of their patient file \( n = 21 \). Three PCL-Rs were completed using a combination of previously completed short versions of the Psychopathy Checklist (PCL-SV) and the remaining items of the PCL-R being completed by a qualified member of the wider research team. Psychopathy is considered to be a construct that is relatively stable over time and is comprised of a combination of stable traits and historical behaviours (Blonigen, Hicks, Krueger, Patrick & Iacono, 2006). Given the stable nature of psychopathy over time, it is therefore reasonable to rely on either patient file material or semi-structured interview for the purposes of research. The present study found a Cronbach alpha coefficient of .8 for Factor 1 and .86 for Factor 2 of the PCL-R demonstrating good internal consistency.
2.4 Procedure

2.4.1 Recruitment procedure for the patient group

Responsible Clinicians identified patients who are eligible to be invited to participate based on their current mental state and current level of risk. Eligible patients were then invited to participate by giving them verbal and written information about the current research and what was involved in participation (see appendix D). Participants who took part in this present study participated as part of a larger research study being conducted at the hospital. This larger study had funding to compensate participants, both patients and a comparison group, £30 for their total time taking part in the research study which took a total of three to five hours conducted over two to five sessions. Potential participants were assured that participation was completely voluntary and deciding not to participate would not impact their clinical care in any way. They were also reassured that if they decided to drop out during participation that this would also not impact their clinical care. A signed informed consent form was obtained from patients who agreed to participate (see appendix E). This consent form made it explicit that participants are also consenting for information from their patient file to be used for the current study.

2.4.2 Recruitment procedure for the comparison group

The comparison group participants were staff who worked at the high secure hospital. Information sheets and contact information were given to managers and supervisors across a range of departments and services in the hospital so that they could inform staff working with them about the research study (see appendix F). Announcements were also made about the current research during staff meetings by the researchers. Staff who were interested in participating were instructed to contact
the researchers via telephone or e-mail that was written on the information sheet. Information sheets and consent forms were given to interested potential participants. Potential participants were also assured that their participation was voluntary and they could withdraw at any time. Participants who took part in this present study participated as part of a larger research study being conducted at the hospital. This larger study had funding to compensate participants, both patients and the comparison group, £30 for their total time taking part in the research study which took a total of three to four hours conducted over two to five sessions. A signed informed consent form was obtained from comparison group participants who agreed to participate (see appendix G).

2.4.3 Testing environment for patients and the comparison group

A designated research space was allocated in the hospital for the purposes of conducting the research with comparison group participants. Side-rooms on wards were used to conduct the research with clinical participants. Both clinical participants and the comparison group attended one session in a designated psychophysiology laboratory in the hospital grounds to do the JORT task.

2.4.4 Testing procedure for patients

All standardized tasks and tasks were administered to patients on the ward. For the JORT an agreed time and date was arranged between the participant, researcher and the member of staff who was required to escort the patient to the laboratory testing room. After participants completed the tasks, the additional information required for the study was obtained from a review of file information and a previous clinical interview conducted by a clinician.
2.4.5 Testing procedure for the comparison group

An agreed time to participate was agreed with comparison group participants. The comparison group completed tasks in the research building. The JORT was completed in the designated laboratory.

2.5 Ethical considerations

No emotional distress was anticipated from taking part in the current study. Significant emotion processing deficits were anticipated, primarily among the patient group. Individual performance outcomes were not disclosed directly to participants but patients were given the option of sharing their results with their clinical team. Participants were advised that they would be provided with general feedback about the results of the research. Patients and the comparison group were compensated for their time for completing the wider research study and received £30. This meant that there may have been a monetary incentive for taking part but this aspect of the study was approved by the ethics committee. Previous research conducted at the hospital also provided a payment for taking part.

2.6 Data analysis

Independent t-tests were used to determine differences between patients and the comparison group for recognition of facial emotions, discrimination of facial emotions, fear and anxiety when both their distributions of scores met the assumptions of normality according to the Kolmogorov-Smirnov statistic. The Kolmogorov-Smirnov statistic was always used to test whether or not the distribution of data met the assumptions of normality. Independent t-tests were also used to investigate differences between patients who met clinical criteria for psychopathy to patients who did not for emotion processing, fear and anxiety. Where both groups
did not contain at least thirty data-points and did not meet the assumptions of normality, Mann-Whitney U-tests were performed.

Correlation analyses were conducted using Pearson’s product moment correlation coefficient to assess the strength and direction of the relationships between psychopathy and emotion processing of facial expressions, fear and anxiety. Spearman’s Rho correlation analysis was performed where data did not meet all of the assumptions for Pearson’s r correlations. Effect sizes were calculated for significant results only.
3. Analysis and Results

3.1 Estimated general intellectual ability

Participants’ estimated premorbid full scale IQ (premorbid FSIQ) was measured using the Wechsler Test of Adult Reading (WTAR). Participants’ estimated current intellectual ability comprised of the mean total scaled score from the vocabulary and matrix reasoning subtests of the WAIS-IV. It must be noted that an estimation of premorbid FSIQ and current estimated intellectual ability was not available for a small number of participants (three and five, respectively). Patients who disclosed poor reading ability or dyslexia were given the option of whether or not to complete the WTAR. Five patients did not complete the vocabulary or matrix reasoning subtest of the WAIS-IV (see Table 3).

Table 3

<table>
<thead>
<tr>
<th></th>
<th>Patients</th>
<th>Comparison group</th>
<th>Statistic</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>t</td>
<td></td>
</tr>
<tr>
<td>Estimated premorbid FSIQ</td>
<td>93(^a)</td>
<td>101.19(^b)</td>
<td>-3.149</td>
<td>.003**</td>
</tr>
<tr>
<td>Estimated current intel.</td>
<td>(11.42)</td>
<td>(8.88)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>estimated ability</td>
<td>8.55(^d)</td>
<td>10.74(^e)</td>
<td>-3.509</td>
<td>.001**</td>
</tr>
</tbody>
</table>

Note. FSIQ = Full scale IQ

\(^a n = 34. \(^b n = 27. \(^c df = 59.98. \(^d n = 32. \(^e n = 27. \(^f df = 56.97

* p = < .05. ** p < .01. ***p < .001

The assumptions for normality were met for both estimated premorbid IQ and estimated current intellectual ability. Independent t-tests were therefore performed to
determine whether or not there were differences between the groups for estimated premorbid FSIQ and for estimated current intellectual ability. There were statistically significant differences found between the groups for both estimated premorbid FSIQ ($t (59.98) = -3.149, p = .033$) and for estimated current intellectual ability ($t (56.97) = -3.509, p = .001$). In both instances, the comparison group recorded higher scores. Despite significant differences between the groups, mean premorbid and current IQ fell in the average range.

### 3.2 Psychopathy

Patients’ psychopathy scores were measured using the Psychopathy Checklist Revised (PCL-R). PCL-R scores were available for thirty-five patients (see table 4). Previous research, especially in Europe, has tended to use a PCL-R cut-off of 25 as opposed to the traditional upper limit of 30 more commonly used in the United States so this cut-off of 25 was therefore used in the present study (Skeem, Polascheck, Patrick, & Lilienfeld, 2011). A summary of PCL-R scores is also presented for patients sub-divided into schizophrenia alone, personality disorder alone, and comorbid schizophrenia and personality disorder. One-way ANOVAs were conducted to determine if there were differences between the patient sub-groups for PCL-R total scores, PCL-R Factor 1 scores and PCL-R Factor 2 scores.
Table 4

Summary of patients’ psychopathy scores

<table>
<thead>
<tr>
<th>Patient group ( ^a ) ( M (SD) )</th>
<th>Schizophrenia alone ( ^b ) ( M (SD) )</th>
<th>Personality Disorder alone ( ^c ) ( M (SD) )</th>
<th>Comorbid group ( ^d ) ( M (SD) )</th>
<th>Statistic p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCL-R Total score</td>
<td>21.25 (8.96)</td>
<td>15.03 (9.75)</td>
<td>25.85 (8.36)</td>
<td>22.03 (4.84)</td>
</tr>
<tr>
<td>PCL-R Factor 1</td>
<td>7.29 (4.09)</td>
<td>5.36 (3.85)</td>
<td>9.49 (4.61)</td>
<td>7.03 (2.85)</td>
</tr>
<tr>
<td>PCL-R Factor 2</td>
<td>12.24 (5.12)</td>
<td>8.73 (5.35)</td>
<td>14.1 (4.84)</td>
<td>13.89 (3.4)</td>
</tr>
<tr>
<td>PCL-R &gt;25</td>
<td>15</td>
<td>3</td>
<td>9</td>
<td>3</td>
</tr>
</tbody>
</table>

\( ^a n = 35. \) \( ^b n = 11. \) \( ^c n = 13. \) \( ^d n = 11. \) \( ^e n = 27. \)

* \( p < .05. \) ** \( p < .01. \) *** \( p < .001 \)

Significant differences were found between the patient sub-groups for total psychopathy scores on the PCL-R and for scores on Factor 2. No significant difference was found for scores on Factor 1 of the PCL-R.

3.3 Emotion recognition

Participants’ emotion recognition was measured using the Emotion Perception Task (EPT). Participants’ EPT emotion recognition total accuracy score (EPT total) was calculated by adding the total number of correctly identified facial emotions (either happy, sad, angry, fearful or neutral) displayed across the sixty trials of the EPT (see Table 5 below). Total accuracy scores for the recognition of individual emotions was calculated by summing the total number of correctly identified facial emotions for each of the individual emotions on the sixty trials of the EPT (happy,
sad, angry, fearful and neutral; see Table 5). The distribution of scores for emotion recognition accuracy did not meet the assumptions of normality for both patients and the comparison group for total scores, happy or neutral. A series of Mann-Whitney U-tests were therefore conducted in order to determine any differences between the groups. Independent t-tests were conducted for sad, angry and fearful.

Table 5

**Summary of participants’ emotion recognition accuracy**

<table>
<thead>
<tr>
<th></th>
<th>Patients(^a)</th>
<th>Comparison group(^b)</th>
<th>Statistic(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mdn (Range)</td>
<td>Mdn (Range)</td>
<td>p value</td>
</tr>
<tr>
<td>EPT recognition total</td>
<td>42 (31-52)</td>
<td>45 (26-52)</td>
<td>U = 425.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p = .314</td>
</tr>
<tr>
<td>EPT recognition Happy</td>
<td>12 (8-12)</td>
<td>11 (8-12)</td>
<td>U = 402.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p = .152</td>
</tr>
<tr>
<td>EPT recognition Sad</td>
<td>5.73 (2.47)</td>
<td>5.96 (2.44)</td>
<td>t = -.375</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p = .709</td>
</tr>
<tr>
<td>EPT recognition Angry</td>
<td>7.54 (1.71)</td>
<td>7.81 (1.73)</td>
<td>t = -.630</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p = .532</td>
</tr>
<tr>
<td>EPT recognition Fearful</td>
<td>7.62 (2.46)</td>
<td>8.18 (2.30)</td>
<td>t = -.928</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p = .357</td>
</tr>
<tr>
<td>EPT recognition Neutral</td>
<td>10 (3-12)</td>
<td>10 (4-12)</td>
<td>U = 493</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p = .928</td>
</tr>
</tbody>
</table>

*Note.* EPT = Emotion Perception Task

\(^a\) \(n = 37\). \(^b\) \(n = 27\). \(^c\) \(df = 62\).

\(* p < .05. ** p < .01. ***p < .001\)

There was no significant difference found between the patient and comparison groups for emotion recognition total accuracy score (\(U = 425.5, z = -1.008, p = .314\)). No differences in recognition accuracy were found between the groups for any of the individual facial emotions: happy (\(U = 402.5, z = -1.433, p = .152\)); sad (\(t (62) = -\)
Emotion recognition accuracy was also investigated within the patient sample to see if differences were present between patients who met clinical criteria for psychopathy compared to patients who did not. Fifteen patients met clinical criteria for psychopathy. Independent t-tests were conducted for EPT recognition variables that met the assumption of normality. Mann-Whitney U-tests were therefore carried out for the remainder of the EPT recognition variables that did not meet the assumption of normality (see Table 6).

Table 6

*Summary of emotion recognition accuracy for psychopathy vs no psychopathy*

<table>
<thead>
<tr>
<th></th>
<th>Psychopathy</th>
<th>No psychopathy</th>
<th>Statistic</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>p</td>
<td></td>
</tr>
<tr>
<td>EPT recognition total</td>
<td>40.6 (5.85)</td>
<td>43.2 (4.75)</td>
<td>$t = 1.451$ (33)</td>
<td>.156</td>
</tr>
<tr>
<td>EPT recognition Happy</td>
<td>12 (8-12)</td>
<td>12 (10-12)</td>
<td>$U = 130.5$</td>
<td>.463</td>
</tr>
<tr>
<td>EPT recognition Sad</td>
<td>5.4 (2.44)</td>
<td>6.1 (2.55)</td>
<td>$t = .817$ (33)</td>
<td>.420</td>
</tr>
<tr>
<td>EPT recognition Angry</td>
<td>7 (5-11)</td>
<td>7 (5-10)</td>
<td>$U = 120.0$</td>
<td>.309</td>
</tr>
<tr>
<td>EPT recognition Fearful</td>
<td>7 (2-11)</td>
<td>9 (1-12)</td>
<td>$U = 96.5$</td>
<td>.072</td>
</tr>
<tr>
<td>EPT recognition Neutral</td>
<td>10 (3-12)</td>
<td>10.5 (6-12)</td>
<td>$U = 119.5$</td>
<td>.301</td>
</tr>
</tbody>
</table>

*a* $n = 15$.  
*b* $n = 20$.

* $p = < .05$. ** $p < .01$. ***$p < .001$
No significant differences were found between patients who met clinical criteria for psychopathy compared to patients who did not meet clinical criteria for psychopathy for any aspects of emotion recognition.

3.4 Discrimination of facial emotions

Participants’ ability to discriminate between the intensity of happy, sad, angry and fearful facial emotions was assessed using the discrimination part of the EPT. This part of the task consisted of sixty-four trials whereby participants were required to discriminate between facial emotions that differed in intensity by 25%, 50%, 75% or 100%. Participants’ emotion discrimination total accuracy score (EPT discrimination total) was calculated by summing the number of correctly identified higher intensity facial emotions across sixty-four trials on part two of the EPT.

The variance of accuracy scores within both patient and comparison groups did not meet the assumptions of normality. In order to ascertain whether or not any differences existed between the groups for emotion discrimination, a series of Mann-Whitney U-tests were performed.

A Mann-Whitney U-test revealed a significant difference for emotion discrimination total accuracy scores between the groups at the .01 alpha level ($U = 274, z = -3.078, p < .01$; effect size $r = .38$) (see Table 7). Further analyses also showed significant differences between patients and the comparison group for emotion discrimination of angry facial emotions ($U = 269, z = -3.212, p < .01$; effect size $r = .4$) and fearful facial emotions ($U = 237.5, z = -3.675, p < .001$; effect size $r = .46$) at the .001 alpha level. No significant differences were found for emotion discrimination between intensity of happy facial emotions ($U = 426, z = -1.065, p =$
.287) or sad facial emotions \((U = 357.5, z = -1.963, p = .050)\). It must be noted that the difference between the groups was at the .05 alpha level threshold for significance and therefore approached significance.

Table 7

**Summary of participants’ emotion discrimination accuracy**

<table>
<thead>
<tr>
<th></th>
<th>Patients(^a)</th>
<th>Comparison group(^b)</th>
<th>Statistic</th>
<th>(p) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPT discrimination total</td>
<td>54 ((25-59))</td>
<td>58 ((40-61))</td>
<td>(U = 274)</td>
<td>(p = .001^{**})</td>
</tr>
<tr>
<td>Happy</td>
<td>15 ((5-16))</td>
<td>15 ((3-16))</td>
<td>(U = 426)</td>
<td>(p = .287)</td>
</tr>
<tr>
<td>Sad</td>
<td>11 ((5-14))</td>
<td>12 ((7-14))</td>
<td>(U = 357.5)</td>
<td>(p = .050)</td>
</tr>
<tr>
<td>EPT discrimination Angry</td>
<td>13 ((7-16))</td>
<td>15 ((11-16))</td>
<td>(U = 269)</td>
<td>(p = .001^{**})</td>
</tr>
<tr>
<td>EPT discrimination Fearful</td>
<td>14 ((7-16))</td>
<td>16 ((12-16))</td>
<td>(U = 237.5)</td>
<td>(p = .000^{***})</td>
</tr>
</tbody>
</table>

\(^a\) \(n = 37\). \(^b\) \(n = 27\).

\(\ast p = < .05\). \(\ast\ast p < .01\). \(\ast\ast\ast p < .001\)

Emotion discrimination accuracy was also investigated within the patient sample to determine whether any differences were present between patients who met clinical criteria for psychopathy compared to patients who did not. None of the EPT discrimination variables met the assumption of normality. Mann-Whitney U-tests were therefore carried out to determine any differences between the groups (see Table 8).
Table 8

*Summary of emotion discrimination accuracy for psychopathy vs no psychopathy*

<table>
<thead>
<tr>
<th>Metric</th>
<th>Psychopathy&lt;sup&gt;a&lt;/sup&gt;</th>
<th>No psychopathy&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Statistic</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPT discrimination total</td>
<td>54 (31-59)</td>
<td>54.5 (25-59)</td>
<td>U = 145.0</td>
<td>p = .882</td>
</tr>
<tr>
<td>EPT discrimination Happy</td>
<td>14 (7-16)</td>
<td>15 (5-16)</td>
<td>U = 143.0</td>
<td>p = .831</td>
</tr>
<tr>
<td>EPT discrimination Sad</td>
<td>11 (5-14)</td>
<td>11 (6-14)</td>
<td>U = 145</td>
<td>p = .882</td>
</tr>
<tr>
<td>EPT discrimination Angry</td>
<td>13 (8-15)</td>
<td>13.5 (7-16)</td>
<td>U = 134.5</td>
<td>p = .610</td>
</tr>
<tr>
<td>EPT discrimination Fearful</td>
<td>14 (7-16)</td>
<td>14.5 (7-16)</td>
<td>U = 141</td>
<td>p = .780</td>
</tr>
</tbody>
</table>

<sup>a</sup>n = 15.  <sup>b</sup>n = 20.

* <i>p</i> = < .05. ** <i>p</i> < .01. *** <i>p</i> < .001

No differences were found for emotion discrimination total accuracy or for any individual facial emotion between patients who met clinical criteria for psychopathy compared to patients who did not meet clinical criteria for psychopathy.

**3.4.1 Emotion discrimination within subgroups**

Emotion discrimination was further investigated within the patient sample and compared to performance of the comparison group. Patients were sub-divided into a sample of patients who had a diagnosis of schizophrenia only (schizophrenia group; <i>n</i> = 11), patients who had a personality disorder only (PD group; <i>n</i> = 13) and patients who were diagnosed with both schizophrenia and personality disorder (comorbid group; <i>n</i> = 13). Mann-Whitney U-tests were used to determine the differences between the individual groups (see Table 9).
### Table 9

*Comparison of patients’ emotion discrimination*

<table>
<thead>
<tr>
<th></th>
<th>Schiz(^a) vs PD(^b)</th>
<th>Schiz(^a) vs Comorbid(^c)</th>
<th>Schiz(^a) vs Comorbid on group(^d)</th>
<th>PD(^b) vs Comorbid on group(^d)</th>
<th>PD(^b) vs Comparison group(^d)</th>
<th>Com(^c) vs Comparison group(^d)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p value(^e)</strong></td>
<td>(p = .015^{**})</td>
<td>(p = .006^{**})</td>
<td>(p &lt; .001^{***})</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EPT discrimination</strong></td>
<td>Schiz &lt; PD</td>
<td>Schiz &lt; Comorbid</td>
<td>Schiz &lt; Comorbid on group</td>
<td>PD &lt; Comorbid on group</td>
<td>PD &lt; Comparison group</td>
<td>Com &lt; Comparison group</td>
</tr>
<tr>
<td>total</td>
<td>(p = .015^{**})</td>
<td>(p = .006^{**})</td>
<td>(p &lt; .001^{***})</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EPT discrimination</strong></td>
<td>Schiz &lt; PD</td>
<td>Schiz &lt; Comorbid</td>
<td>Schiz &lt; Comorbid on group</td>
<td>PD &lt; Comorbid on group</td>
<td>PD &lt; Comparison group</td>
<td>Com &lt; Comparison group</td>
</tr>
<tr>
<td>angry</td>
<td>(p = .042^{*})</td>
<td>(p = .028^{*})</td>
<td>(p &lt; .001^{***})</td>
<td>(p = .033^{*})</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EPT discrimination</strong></td>
<td>Schiz &lt; PD</td>
<td>Schiz &lt; Comorbid</td>
<td>Schiz &lt; Comorbid on group</td>
<td>PD &lt; Comorbid on group</td>
<td>PD &lt; Comparison group</td>
<td>Com &lt; Comparison group</td>
</tr>
<tr>
<td>fear</td>
<td>(p = .045^{*})</td>
<td>(p = .025^{*})</td>
<td>(p &lt; .001^{***})</td>
<td></td>
<td>(p = .006^{**})</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) \(n = 11\). \(^b\) \(n = 13\). \(^c\) \(n = 13\). \(^d\) \(n = 27\). \(^e\) \(p\) value set at \(0.017\) in line with Bonferroni adjustment

* \(p < .05\). ** \(p < .017\). *** \(p < .001\)

Emotion discrimination was significantly lower for the schizophrenia group compared to the PD group, comorbid group and the comparison group for emotion discrimination total accuracy, emotion discrimination of angry facial emotions and emotion discrimination for fearful facial emotions at the \(0.05\) alpha level. When the Bonferroni adjustment was applied and set the alpha level at \(0.017\) in order to take into account the multiple comparisons some significant differences between the groups remained. Specifically, significant differences remained between the
schizophrenia group compared to all other patient and comparison groups for emotion discrimination total accuracy at the .017 alpha level. Within patient sample comparisons were no longer significant for discrimination of anger and fear at the .017 alpha level.

### 3.5 Induced fear and anxiety

Fear and anxiety was measured using the Joystick Operated Runway Task (JORT). A measure of induced was calculated based on the difference between participants’ average velocity under threat of white noise and average velocity when not under threat of white noise. Induced anxiety was measured as the difference between the magnitude of participants’ approach-withdrawal oscillation when under the threat of white noise compared to not being under the threat of white noise.

Patients \((n = 30)\) and the comparison group \((n = 27)\) completed the JORT task. Participants who recorded more than 25 hits on the task were removed from data analysis (patients; \(n = 4\)). This number of hits appeared to suggest poor effort. Both patients and the comparison group exhibited normally distributed scores. Independent t-tests were therefore conducted to determine any differences between the groups (see Table 10).
Table 10

*Summary of participants’ induced fear and anxiety*

<table>
<thead>
<tr>
<th></th>
<th>Patients(^a)</th>
<th>Comparison group(^b)</th>
<th>Statistic(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>p value</td>
</tr>
<tr>
<td>JORT number of hits</td>
<td>13.19 (7.23)</td>
<td>11.81 (7.33)</td>
<td>t = .688</td>
</tr>
<tr>
<td>JORT maximum strength</td>
<td>35.96 (10.24)</td>
<td>35.98 (7.25)</td>
<td>p = .995</td>
</tr>
<tr>
<td>JORT total fear</td>
<td>.371 (.725)</td>
<td>.604 (.986)</td>
<td>t = -.98</td>
</tr>
<tr>
<td>JORT total anxiety</td>
<td>-.016 (.654)</td>
<td>.153 (.296)</td>
<td>t = -1.22</td>
</tr>
</tbody>
</table>

*Note.* JORT = Joystick operated runway task

\(^a\) n = 26. \(^b\) n = 27. \(^c\) df = 51.

No significant differences were found between the groups for any of the variables tested: hits (t (51) = .688, p = .494), maximum strength (t (44.91) = -.006 p = .995), fear (t (51) = -.98, p = .332) and anxiety (t (34.5) = -1.22, p = .236). Further analysis using one-way ANOVA revealed no significant differences between the patient subgroups (schizophrenia group, PD group, comorbid group and comparison group) for either fear (F (3, 49) = .424, p = .737) or anxiety (F (3, 49) = .701, p = .556).

3.6 Correlation between psychopathy, emotion processing, fear and anxiety

Pearson product moment correlations were conducted to determine the nature of the relationship for patients (n = 35) between psychopathy (PCL-R score) and emotion recognition, emotion discrimination, fear and anxiety (see Table 11).
Table 11

*Correlation between psychopathy, emotion processing, fear and anxiety*

|                                | Psychopathy<sup>a</sup> |     
|--------------------------------|-------------------------|------
| EPT recognition accuracy total | $r = -.258^{b}$         | $p = .135$  
| EPT discrimination total accuracy | $r = .116^{c}$         | $p = .508$  
| JORT total fear                | $r = -.181^{b}$         | $p = .376$  
| JORT total anxiety             | $r = .081^{b}$         | $p = .693$  

<sup>a</sup> $n = 35$.  
<sup>b</sup> Pearson product-moment correlation coefficient.  
<sup>c</sup> Spearman’s Rho correlation.

* $p < .05$. ** $p < .01$. *** $p < .001$

No significant correlations were found between PCL-R scores and any of the other variables relating to emotion recognition response time, emotion discrimination, fear or anxiety.
4. Discussion

The aim of the present study was to characterize emotion processing, fear and anxiety among mentally disordered offenders at a high secure hospital in England. The first research question aimed to determine whether or not there was a difference in emotion processing between mentally disordered offenders and the comparison group. Participants were compared on recognition of facial emotions and discrimination between intensity of facial emotions. The present study found no differences between mentally disordered offenders and the comparison group for total accuracy in recognition of facial emotions. No differences were found when compared for specific emotions such as happy, sad, angry, fearful or neutral. This finding contrasts with previous research that reported significant deficits in emotion recognition of facial emotions, particularly negative ones, among individuals with schizophrenia compared to the comparison group (Kohler et al., 2010). This finding also conflicts with previous research that showed emotion recognition deficits among violent offenders, with and without psychological disorder, compared to the comparison group (eg. Robinson et al., 2012; Seidel et al., 2013). However this finding is similar to previous research that also used a control sample of high secure hospital employees. For example, Loomans, Tulen & Marle (2015) compared a sample of mentally disordered offenders with Antisocial Personality Disorder (ASPD) with or without clinical levels of psychopathy to a control sample of forensic hospital employees and found no difference for emotion processing between the groups (Loomans et al., 2015). Interestingly, this study did however find a significant difference between patients and an additional sample of controls from the community (Loomans et al., 2015).
For discrimination between the intensity of facial emotions, the present study found significant differences between mentally disordered offenders and the comparison group. A significant difference was found for overall discrimination of a range of facial emotions, citing a medium effect size. Significant differences were also found for discrimination between intensity of specific facial emotions such as anger and fear with larger effect sizes found for both of these emotions. This finding suggests that mentally disordered offenders exhibit impairment in distinguishing between the same emotion at different levels of intensity and that high-secure hospital staff are better at doing this.

Upon further investigation significant differences for ability to discriminate between intensity of facial emotions were found between sub-groups (patients with schizophrenia only, personality disorder only and comorbid schizophrenia and personality disorder). The present study found that mentally disordered offenders with schizophrenia alone performed significantly worse than both the personality disorder group and the comorbid group for overall discrimination of intensity of emotion at the adjusted significance level in line with the more stringent Bonferroni adjustment. Previous research has generally excluded offenders with schizophrenia (eg. Baskin-Sommers et al., 2010; Keihl et al., 2001) from research exploring emotion processing in violent offenders. Other research has used samples with either schizophrenia (eg. Fullam & Dolan, 2006; Demirbuga et al., 2013) or samples with personality disorder alone (eg. Dolan & Fullam, 2006). This study is the first to compare mentally disordered offenders with and without schizophrenia and personality disorder on the ability to discriminate intensity of emotions. This finding
suggests that mentally disordered offenders with schizophrenia exhibit impaired
discrimination of facial emotions.

The relationship between psychopathy and emotion processing was also
investigated in the present study. No significant relationship was found between
psychopathy and overall emotion recognition accuracy among mentally disordered
offenders. This finding is in line with previous research that investigated the
association between psychopathy and emotion recognition accuracy among mentally
disordered offenders with schizophrenia (eg. Dolan & Fullam, 2006). Psychopathy
was not found to be related to any other aspects of emotion recognition or
discrimination among mentally disordered offenders that took part in the present
study.

The present study compared mentally disordered offenders who met clinical
criteria for psychopathy (score of 25 or above on the PCL-R) to offenders who did
not meet clinical criteria for psychopathy (score below 25 on the PCL-R). High
levels of psychopathy were found in this present sample and confirms reports that
high levels of psychopathy are present among samples of mentally disordered
offenders (Soderstrom et al., 2005). No differences for emotion recognition or
discrimination were found between offenders with psychopathy to offenders without
psychopathy. The groups also did not differ for emotion recognition or
discrimination for accuracy on individual emotions (eg. happy, sad, angry, fearful or
neutral). This finding generally fits with previous research that also found no
differences between mentally disordered offenders with and without psychopathy for
most facial emotions with the exception of sad facial emotions (eg. Dolan and
Fullam, 2006; Fullam & Dolan, 2006). However it is important to acknowledge that

...
psychopathy as a construct is measured on a continuum and that a cut off of 25, although justified, is arbitrary. Therefore, a score of 24 does not necessarily mean that a person exhibits psychopathic traits that differ greatly from a person who scores 25. Added to this, a person who scores eight is likely to be qualitatively different from a person who scores 24 despite both individuals not meeting clinical criteria for psychopathy. It is possible that this may account for the lack of differences found between the psychopathy and no psychopathy groups (Dolan & Fullam, 2006).

The present study also sought to determine how mentally disordered offenders experience induced fear compared to the comparison group. No differences were found between the groups. Also, no differences were found between the subgroups for the experience of fear. This finding contrasts with findings from previous research that found a reduced fear response in mentally disordered offenders with personality disorder compared to mentally disordered offenders with schizophrenia (Kumari et al., 2009). However the present study used the threat of a burst of white noise to induce fear whereas Kumari et al. (2009) used the threat of an electric shock to elicit fear among participants. It is possible that the threatening stimuli in the present study did not stimulate the fear response in the same way as the previous study did.

The experience of induced anxiety was also investigated in the present study. The present study found no difference in induced anxiety between mentally disordered offenders and the comparison group or between the subgroups of mentally disordered offenders and the comparison group. Again, this finding contrasts the previous research that found increased anxiety among mentally disordered offenders with schizophrenia compared to mentally disordered offenders with personality
disorder (Kumari et al., 2009). It is worth noting again as in the previous section that the stimuli used to induce anxiety differed in the present study compared to the stimuli used in the Kumari et al. (2009) study. The present study also reported no relationship between psychopathy and induced anxiety which also contrasts with previous research that reduced anxiety was related to higher levels of psychopathy (Heym & Lawrence, 2010). All previous studies used measures of induced fear and anxiety. It is therefore difficult to establish the ecological validity of study findings without eliciting these emotions in real-world settings.

4.1 Theoretical implications

The present study found no differences between mentally disordered offenders and the comparison group for emotion recognition but did find differences for discrimination between emotional intensity and this has important theoretical implications. The Violence Inhibition Model VIM, proposed by Blair (1995), purported that a disruption in how emotion is processed can explain violent behaviour. However, this model does not account for individuals who have reduced emotion recognition but do not have a history of violence, such as high-secure hospital staff who took part in the present study. It is possible that a concurrent process of desensitization to facial emotions may be occurring in staff working in high secure psychiatric settings. Walsh & Freshwater (2009) discuss the process of ‘emotional dissonance’ that staff working in settings of confinement experience. They specifically discuss the necessity for staff working in these settings to suppress felt emotion and display alternative emotional states in order to work effectively (Walsh & Freshwater, 2009).
Added to this, the finding that patients with schizophrenia preformed significantly worse for emotion discrimination compared to both the PD and comorbid groups has important theoretical implications. The VIM (Blair, 1995) does not account for all types of violent behaviour, particularly defensive aggression typically carried out by individuals with schizophrenia (Levi, Nussbaum & Rich, 2010). The patient group in the present study had a history of violent crime that ranged in nature (e.g. predatory, defensive and irritable). Levi et al. (2010) discuss predatory, defensive and irritable aggression and how individuals with schizophrenia are more likely to carry out defensive aggression that is theoretically distinct from predatory violence. It is possible that the social information processing model (Crick & Dodge, 1994) or Kohlberg’s (1969, 1984) cognitive development model of moral reasoning may account for the long-term patterns of aggressive behaviour seen in many violent offenders through the misinterpretation and misunderstanding of the emotions of others (Arsenio & Lemerise, 2004). However it is unclear how these models account for violent offending among individuals with mental disorder who commit violent crimes during periods of illness and in times when their mental illness is being treated would not engage in such acts. The findings of the present study highlight a need to integrate these differences in violent offending with theories of emotion processing deficits. Current theories do not appear to account for differences in violent offending comprehensively.

4.2 Clinical implications

The present study found that mentally disordered offenders with schizophrenia exhibited significantly greater impairments in discriminating between intensity of emotions compared to patients with personality disorder. This impairment remained
after controlling for psychopathy. It might be helpful for this finding to be considered when offering psychological interventions to this cohort of patients. Research has previously reported that individuals with schizophrenia are at an increased risk of perpetrating violent crimes compared to individuals with other types of psychological disorders (Eronen et al., 1998). Interventions that focus on increasing this cohort’s ability to process emotion could help to increase their ability to interpret the emotional states of others more accurately. Individuals with schizophrenia are at an increased risk of perpetrating defensive violence (Levi et al., 2010) and having an ability to accurately interpret the intensity of a person’s emotional state may help to reduce the likelihood of misinterpreting an individual’s intention and thus committing a violent act.

4.3 Strengths and limitations

4.3.1 Strengths and limitations of the sample

Previous research recommended using a sample of violent offenders with and without schizophrenia and personality disorder when exploring emotion processing (Demirbuga et al., 2013). A significant strength of the present study was therefore that it included a sample of offenders who also had a history of significant psychological disorder such schizophrenia unlike previous studies that excluded this group (eg. Baskin-Sommers et al., 2010; Kiehl et al., 2001). The sample also included offenders with personality disorder, predominantly anti-social, unlike other studies of emotion processing (eg. Baskin-Sommers et al., 2001; Newman et al., 2010).

Using a sample of staff working at a high secure hospital limits how the results may be interpreted. Previous research has consistently shown significant differences
for emotion recognition between offenders and controls but this study did not.

However differences were found for discrimination between emotions. It is possible that the group of comparison participants used in the present study may process emotion in a different way to members of the general public due to the setting in which they work.

Flat affect in schizophrenia is more common in males compared to females and is very resistant to treatment (Gur et al., 2006). It is possible that staff at the high secure hospital working with a majority of patients with a diagnosis of schizophrenia may not be exposed to the variety of facial emotions that members of the general population working in other domains would be. Added to this, NICE guidelines for reduction of violence and aggression recommend that staff pay attention to a wide range of indicators of changes in emotional state other than just facial emotion along (NICE, 2005). These guidelines encourage staff to complete frequent risk assessments and pay attention to antecedents of risk-related behaviours among patients, such as changes in body tension, volume of speech, prolonged eye contact, positioning and withdrawal (NICE, 2005). Nice guidelines for reduction of violence and aggression, coupled with high rates of flat affect among patients with schizophrenia, may mean that staff pay less attention to subtle changes in facial emotion and more attention to a wider range of indicators of aggression. This may help to explain the lack of significant differences found between the patient group and comparison group in the present study.

Added to this, staff working with individuals who have high levels of paranoia, such as is the case with the sample in the present study, are recommended to avoid displaying an ‘overly warm’ therapeutic style to prevent individuals with paranoia
from misunderstanding their kindness for camouflaging suspected negative alternative intentions (Carroll, 2009). This may result in staff not engaging with patients in the same way as staff working with individuals who are not paranoid. Furthermore, the UK Ministry of Justice recognizes the link between staff burnout and depersonalization of patients, especially patients with personality disorder (Ministry of Justice, 2011; Hill et al., 2006). Burnout is high among staff working in mental health and forensic settings (Hill et al., 2006) and a tendency to depersonalize patients in the sample in the present study may be a factor in explaining the findings. However additional research is needed to test these resulting hypotheses from the findings of this present study.

Although comparable in sample size to previous research where differences in emotion processing have been found among offenders (eg. Seidel et al., 2013), the sample size used in the present study limited the range of analyses that could be carried out. A larger sample size would increase power to detect differences between patients and the comparison group. Also, although a previous validation study of the JORT used in the present study only used 30 controls in a repeated measures study (Perkins et al., 2009), this present study may have benefitted from a larger sample size in order to determine any differences between sub-groups of mentally disordered offenders. For example, research has previously reported that offenders with schizophrenia experience fear differently to offenders with personality disorder (Kumari et al., 2009).

4.3.2 Strengths and limitations of the analysis

The analyses used in the present study were a mixture of parametric and non-parametric statistical analyses. Having samples that exhibited often unevenly
distributed data meant that the use of non-parametric tests often needed to be employed. The present study was careful to use appropriate tests that met the relevant assumptions.

4.3.3 Strengths and limitations of the measures used

The measures used to investigate emotion processing and psychopathy were a significant strength of the research design. In line with previous research on psychopathy and emotion processing in mentally disordered offenders (eg. Anton et al., 2012; Domes et al., 2013; Kosson et al., 2006), this study used the internationally-established Psychopathy Checklist. However the use of a laboratory task to explore fear and anxiety limits the ecological validity of the findings. Added to this, the present study did not include any self-report measures of fear and anxiety to correlate with the outcomes of the JORT task. Future research could add to the ecological validity of this task by including measures of self-reported fear and anxiety. The contribution of schizophrenia above psychopathy could be further strengthened by future research including a measure of psychotic symptoms when investigating emotion processing. A significant strength of the present study was the use of the PCL-R. However it is not possible to account for the potential difference in quality of measurement between clinicians who conduct PCL-R’s and researchers who completed the PCL-R based on a file review.

4.4 Recommendations for future research

In order to address the sampling and analysis limitations of this study, future research could include a range of additional, larger samples. For example, the inclusion of a sample of offenders from a prison setting without a history of psychological disorder would allow comparative analyses to further determine the
role of schizophrenia and personality disorder to emotion processing. A sample of controls from the community to compare to mentally disordered offenders might address the possible limitations of emotion experience and expression in the present comparison sample. The contribution of schizophrenia to emotion processing deficits and to how it relates to violent offence type should be further explored. In order to address limitations related to measurement, a self-report measure of fear and anxiety is included to explore the ecological validity of the JORT.

4.5 Conclusion

The present study found differences between mentally disordered offenders and a comparison group in relation to discrimination between intensity of emotion. This has important theoretical implications for how emotion processing deficits are understood in the context of violent offending. It is particularly relevant for integrating different types of violent offending in a theoretical framework. It also has implications for how clinicians implement treatment for mentally disordered offenders, particularly those with schizophrenia and emotion processing impairment.
References


List of appendices

Appendix A: Anonymised copy of NHS ethics committee favourable opinion letter
Appendix B: Anonymised copy of University of Surrey ethics committee favourable opinion letter
Appendix C: Journal guide for authors
Appendix D: Anonymised copy of patient information sheet
Appendix E: Anonymised copy of patient consent form
Appendix F: Anonymised copy of control information sheet
Appendix G: Anonymised copy of control consent form
Appendix H: Anonymised copy of R&D approval letter
Appendix I: Histograms for analyses
Appendix J: Table 2 from literature review
Appendix A: Anonymised copy of NHS ethics committee favourable opinion letter

Health Research Authority
NRES Committee London - Camberwell St Giles
Bristol Research Ethics Centre
Level 3, Block B
Whitenars
Lehins Mead
Bristol
BS1 2NT

14 March 2014
Ms Ottlie Sedgwick
Institute of Psychiatry
King’s College London
London
SE5 8AF

Dear Ms Sedgwick,

Study title: Characterisation of, and Prediction of Clinical Outcomes in Mentally Disordered Offenders
REC reference: 14/LO/0238
IRAS project ID: 98463

Thank you for your letter of 07 March 2014, responding to the Committee’s request for further information on the above research and submitting revised documentation.

The further information was considered in correspondence by a sub-committee of the REC. A list of the sub-committee members is attached.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details, unless you expressly withhold permission to do so. Publication will be no earlier than three months from the date of this favourable opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to withhold permission to publish, please contact the REC Manager Mr Thomas Fairman, nrescommittee.london-camberwellstgiles@nhs.net.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Ethical review of research sites

NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management
permission being obtained from the NHS/HSC R&D office prior to the start of the study (see “Conditions of the favourable opinion” below).

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission (“R&D approval”) should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at [http://www.rdforum.nhs.uk](http://www.rdforum.nhs.uk).

Where a NHS organisation’s role in the study is limited to identifying and referring potential participants to research sites (“participant identification centre”), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations.

Registration of Clinical Trials

All clinical trials (defined as the first four categories on the IRAS filter page) must be registered on a publicly accessible database within 8 weeks of recruitment of the first participant (for medical device studies, within the timeline determined by the current registration and publication trees).

There is no requirement to separately notify the REC but you should do so at the earliest opportunity e.g. when submitting an amendment. We will audit the registration details as part of the annual progress reporting process.

To ensure transparency in research, we strongly recommend that all research is registered but for non clinical trials this is not currently mandatory.

If a sponsor wishes to contest the need for registration they should contact Catherine Blewett ([catherineblewett@nhs.net](mailto:catherineblewett@nhs.net)), the HRA does not, however, expect exceptions to be made. Guidance on where to register is provided within IRAS.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:
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<tr>
<td>Response to Request for Further Information</td>
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<td>07 March 2014</td>
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Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.
After ethical review

Reporting requirements

The attached document "After ethical review – guidance for researchers" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

Further information is available at National Research Ethics Service website > After Review

14/LO/0238 Please quote this number on all correspondence

We are pleased to welcome researchers and R & D staff at our NRES committee members’ training days – see details at http://www.hra.nhs.uk/hra-training/

With the Committee’s best wishes for the success of this project.

Yours sincerely

[Signature]

Mr John Richardson
Chair

Email: nrescommittee.london-camberwellstgiles@nhs.net

Enclosures: List of names and professions of members who were present at the meeting and those who submitted written comments
"After ethical review – guidance for researchers"

Copy to: Mr Keith Brennan
Ms Rubina Choudhry, West London Mental Health Trust
NRES Committee London - Camberwell St Giles

Attendance at Sub-Committee of the REC meeting in correspondence

Committee Members:

<table>
<thead>
<tr>
<th>Name</th>
<th>Profession</th>
<th>Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mrs Jennifer Bostock</td>
<td>Philosopher of Psychiatry</td>
<td>Yes</td>
</tr>
<tr>
<td>Mr John Richardson (Chair)</td>
<td>Retired Director of COREC, Ecumenical Officer for Churches Together in South London</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Also in attendance:

<table>
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<tr>
<th>Name</th>
<th>Position (or reason for attending)</th>
</tr>
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<tr>
<td>Mr Tom Fairman</td>
<td>REC Manager</td>
</tr>
</tbody>
</table>
Appendix B: Anonymised copy of University of Surrey ethics committee favourable opinion letter

Faculty of Arts and Human Sciences
Ethics Committee

Chair’s Action

Proposal Ref: 1034-PSY-14
Name of Student/Trainee: DR AISLING PARSONS
Title of Project: Characterising Emotion Processing, Fear and Anxiety in Mentally Disordered Offenders
Supervisor: Dr Emily Glorney
Date of submission: 11th June 2014

The above Project has received a favourable ethical opinion from the NHS and expeditious favourable ethical opinion has now been granted by the Faculty of Arts and Human Sciences Ethics Committee on the basis described in the protocol and supporting documentation, including confirmation of a favourable ethical opinion from the NHS Research Ethics Committee.

This documentation should be retained by the student/trainee in case this project is audited by the Faculty Ethics Committee

Signed: [Signature]
Dr Daniel McCarthy
Deputy Chair
On behalf of Professor Bertram Opitz, Chair

Dated: 14.07.14

Please note: If there are any significant changes to your proposal which require further scrutiny, please contact the Faculty Ethics Committee before proceeding with your Project.
Appendix C: Journal guide for authors

PSYCHIATRY RESEARCH

AUTHOR INFORMATION PACK

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- Impact Factor p.1
- Abstracting and Indexing p.2
- Editorial Board p.2
- Guide for Authors p.4

DESCRIPTION

The journal provides very rapid publication of short but complete research reports in the field of psychiatry. The scope of the journal encompasses: (1) Biochemical, physiological, genetic, psychological, and social determinants of human behavior; (2) Assessment of human behavior and subjective state; (3) Evaluation of somatic and non-somatic psychiatric treatments.

In addition, reports of clinically related basic studies in the fields of neuropharmacology, neurochemistry, neuroendocrinology, electrophysiology, psychology, genetics, and brain imaging are published. Significant methodological advances such as instrumentation, clinical scales, and assays directly applicable to psychiatric research are also appropriate. Brief reviews, theoretical contributions, and letters to the editor will be considered.

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AUDIENCE

Psychiatrists, Neuroscientists, Pharmacologists, Endocrinologists.

IMPACT FACTOR

2013: 2.682 © Thomson Reuters Journal Citation Reports 2014

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GUIDE FOR AUTHORS

Rapid publication is a priority; hence, authors are requested to pay close attention to the following instructions for the submission of manuscripts to the journal Psychiatry Research.

Preparation of manuscripts

Title page. The Title page should include the author byline, with names of authors on the same line(s). Superscript letters (a, b, c), not numerals, should be used to key institutional affiliation (if all authors are in the same department, the superscript letter should be omitted); an asterisk should be entered to designate the corresponding author. Underneath the byline, institutional affiliations should be listed (department, institution, city, state or province (if applicable) and country. Funding information should not be included on the title page but should instead be given following the Discussion section. In an asterisked Corresponding Author footnote at the bottom of the title page, telephone/fax numbers and e-mail address of the corresponding author should be provided; e-mail addresses, if desired, may also be provided for the co-authors (or co-corresponding author, if applicable).

Abstract. The Abstract should be 150–200 words for full-length articles and 75 words for brief reports, summarizing the aims of the study, the methods used, the results and the major conclusions. Do not include a summary at the end of the article. Note that Psychiatry Research does not use the structured abstract style; do not include bold-faced headings within the abstract. The Abstract should be a single paragraph. Do not include detailed statistics or p-values in the abstract; simply say “significant” or “non-significant.” The Abstract should be followed by up to seven Key Words, which accord with the indexing

The abstract should be followed by up to seven key words should be listed which accord with the indexing conventions of Index Medicus. Note that the keywords should not duplicate words used in the title of the article, which will be automatically indexed.

Text. Although exceptions will be considered, manuscripts should not exceed 5000 words, and shorter manuscripts (e.g., 3000 words) are preferred. Each article should contain the following major headings: Introduction (preceded by arabic number 1.), Methods (preceded by number 2.), Results (preceded by number 3.), Discussion (preceded by number 4.), Acknowledgment (optional section following the discussion, which should not be preceded by a numeral), and References (should not be preceded by a numeral).

Subheadings should follow the numbering system used in the major heading; for example, the subheading “Subjects” within the Methods section should be flush left on a separate line and designated 2.1., the subheading “Procedures” should be designated 2.2., etc.

Lower level headings, if required, should also be numbered (e.g., "2.1.1. Patients." as a lower order heading under "2.1. Subjects."). Only the first letter of the first word of each heading should be capitalized.

The use of abbreviations within the text should be minimized, and each abbreviation, when introduced, must be defined and used consistently thereafter. Systeme International measurements should be used. For products or instruments (do not abbreviate) used in the research reported, provide the name, city and country of the supplier in parentheses. All tables and figures must be referred to in the text.

Manuscript categories

Articles. Although exceptions will be considered, manuscripts should not exceed 5000 words, and shorter manuscripts (e.g., 3000 words) are preferred. Each article should contain the following major headings: Introduction (preceded by arabic number 1.), Methods (preceded by number 2.), Results (preceded by number 3.), Discussion (preceded by number 4.), Acknowledgment (optional section following the discussion, which should not be preceded by a numeral), and References (should not be preceded by a numeral). Subheadings should follow the numbering system used in the major heading; for example, the subheading “Subjects” within the Methods section should be flush left on a separate line and designated 2.1., the subheading “Procedures” should be designated 2.2., etc. Lower level headings, if required, should also be numbered (e.g., "2.1.1. Patients." as a lower order heading under "2.1. Subjects."). Only the first letter of the first word of each heading should be capitalized.
**Brief reports.** Brief reports should not exceed 1500 words, including a 75-word abstract, 3 keywords, text, and references plus 1 table or 1 figure.

**Case reports.** Case reports will only be considered as Letters to the Editor (see following instructions).

**Letters to the Editor.** Letters to the Editor should be 750-1000 words or less. The Letter should not include a title page, abstract or key words. Authors' names and affiliations should be listed at the end of the Letter, along with the corresponding author's email address. There should be no more than 5 references, and no tables or figures.

**Introduction.** The introduction should be brief and explain the purpose of the study; an extensive review of the literature should be avoided, but directly relevant articles by other investigators, as well as by the authors themselves, must be cited. If the manuscript includes subjects who have been included in previous reports, references should be provided and the number of subjects whose data have been included elsewhere should be specified.

**Methods.** The Methods should contain sufficient detail to enable others to repeat the procedures without studying the references directly.

**Results.** The Results should summarize the most important data, and statistical correlations should be included. Tabular data should not be duplicated in the text; important points and trends should be pointed out. The final sentence should emphasize the importance attached to the observations.

**Discussion.** The discussion should relate directly to the study being reported and give perspective to the adequacy of the materials and methods for the purpose of the study. Results should be interpreted to lend meaning to the observations. Any discrepancies with previously published results should be explained. The paper should conclude with a brief statement regarding the significance of the study.

**Acknowledgement.** The Acknowledgement section is an optional section and should also be used for grant-support information.

**Contributors.** The individual contributions of each author should be briefly summarized.

**Conflict of Interest.** All authors are requested to disclose any actual or potential conflict of interest including any financial, personal or other relationships with other people or organizations within three (3) years of beginning the work submitted that could inappropriately influence, or be perceived to influence, their work. Examples of potential conflicts of interest that should be disclosed include employment, consultancies, stock ownership (except for personal investment purposes equal to the lesser of one percent (1%) or USD 5000), honoraria, paid expert testimony, patent applications, registrations, and grants. If there are no conflicts of interest, authors should state that there are none.

**Abbreviations.** Define abbreviations at their first occurrence in the article. Abbreviations should be defined when they first occur in the abstract, in the text, and also in tables and figure legends. Once an abbreviation has been introduced in the main body of the text, it should be used throughout.

**Statistical reporting.** Statistical reporting should be complete, including at a minimum name of statistical test, test value, degrees of freedom where appropriate, and p-value. Italic font should be used for n (sample size) and statistical terms, e.g., t, r, F, U, p.

**Submission of manuscripts.** Psychiatry Research proceeds totally online via an electronic submission system. In case you do not have an Internet connection, please contact the Managing Editor for alternative instructions. By accessing the online submission at [http://ees.elsevier.com/psyn](http://ees.elsevier.com/psyn) you will be guided stepwise through the creation and uploading of the various files. Authors will be requested to direct the manuscripts to the most appropriate Section/Category of research to assist in editor assignment.

**NOTE TO AUTHORS:** Psychiatry Research has a separate section to which neuroimaging-related articles should be submitted. All articles about MRI, PET, fMRI, SPECT, MEG and topographic EEG should be submitted to the Neuroimaging Section: [http://ees.elsevier.com/psyn](http://ees.elsevier.com/psyn)

AUTHOR INFORMATION PACK 19 Mar 2015 www.elsevier.com/locate/psychres
Authors may email queries concerning the submission process or journal procedures to the Managing Editor of Psychiatry Research: Sherry Buchsbaum (sherry.buchsbaum@gmail.com).

**BEFORE YOU BEGIN**

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Manuscripts that are not published and that are not resubmitted in revised form will be destroyed within 1 year of the date of submission.

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It is important that the file be saved in the native format of the word processor used. The text should be in single-column format. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. In particular, do not use the word processor's options to justify text or to hyphenate words. However, do use bold face, italics, subscripts, superscripts etc. When preparing tables, if you are using a table grid, use only one grid for each individual table and not a grid for each row. If no grid is used, use tabs, not spaces, to align columns. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the Guide to Publishing with Elsevier: http://www.elsevier.com/guidepublication). Note that source files of figures, tables and text graphics will be required whether or not you embed your figures in the text. See also the section on Electronic artwork.

To avoid unnecessary errors you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

Article structure
Subdivision - numbered sections
Divide your article into clearly defined and numbered sections. Subsections should be numbered 1.1 (then 1.1.1, 1.1.2, ...), 1.2, etc. (the abstract is not included in section numbering). Use this numbering also for internal cross-referencing: do not just refer to the 'text'. Any subsection may be given a brief heading. Each heading should appear on its own separate line.

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- **Corresponding author.** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. Ensure that the e-mail address is given and that contact details are kept up to date by the corresponding author.
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**Abstract**

A concise and factual abstract is required. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

**Graphical abstract**

Although a graphical abstract is optional, its use is encouraged as it draws more attention to the online article. The graphical abstract should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: Please provide an image with a minimum of 531 x 1328 pixels (h x w) or proportionally more. The image should be readable at a size of 5 x 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files. See http://www.elsevier.com/graphicalabstracts for examples.

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**Keywords**

Immediately after the abstract, provide a maximum of 6 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Do not repeat words found in the title of the manuscript. Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

**Abbreviations**

Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

In the abstract, define all abbreviations so that electronic searches for commonly used abbreviations or the full name can be successful. Avoid abbreviations unique to the current article so as to widen the circle of readers. We recognize that many abbreviations or acronyms may be more familiar to the reader than the full name. However abbreviations and acronyms used by relatively few other published reports or abbreviations with several alternate meanings in data base searches should always be spelled out throughout the report.

**Acknowledgements**

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

**Footnotes**

Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors can build footnotes into the text, and this feature may be used. Otherwise, please indicate the position of footnotes in the text and list the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list.

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**Electronic artwork**

**General points**

- Make sure you use uniform lettering and sizing of your original artwork.
- Embed the used fonts if the application provides that option.

**AUTHOR INFORMATION PACK 19 Mar 2015**

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• Size the illustrations close to the desired dimensions of the published version.
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TIFF (or JPEG): Bitmapped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi.
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• Supply files that are too low in resolution;
• Submit graphics that are disproportionately large for the content.

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Please submit tables as editable text and not as images. Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the article. Please avoid using vertical rules.

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Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the
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Provide the last names and first initials of all authors (do not use et al. in the reference list). Journal titles should not be abbreviated; provide the journal’s full name. Do not italicize journal or book titles.

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Include only references that have been cited in the text. Provide the names of all authors; do not use "et al." in the reference list.

Examples of typical types of references follow. In addition to the particular reference styles, the examples illustrate the order in which references should be listed and give examples of "a" and "b" designations.


The correctness of the reference list is the entire responsibility of the author! Please check it carefully and remember to recheck when your article has been revised. Unpublished results should not be included in the reference list but, rather, should be quoted in the text (Smith and co-workers, unpublished results).

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INFORMATION SHEET FOR PATIENTS

YOU WILL BE GIVEN A COPY OF THIS INFORMATION SHEET

Characterisation of, and prediction of clinical outcomes in, mentally disordered offenders.

We would like to invite you to participate in this original research project, which is being carried out as part of an educational PhD qualification. This research has been reviewed and approved by the Camberwell St Giles Research Ethics Committee. You should only participate if you want to; choosing not to take part will not disadvantage you in any way. Before you decide whether to take part, it is important for you to understand why the research is being done and what your participation will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or you would like more information.

The aim of the research

The main aim of this research is to see which characteristics are associated with doing well here at [location]. It is likely that some groups of people (e.g. people with a specific diagnosis) are more responsive to the treatments offered here than other groups. This research will aim to identify which people are doing well at [location] and responding well to treatment, and those who are not. We hope that this information will help us to develop new treatment targets in the future for those people who maybe aren’t doing so well.

Why am I being asked to take part?

We are inviting patients across the hospital to take part in this study, and your responsible clinician has suggested that you may be able to take part.

Do I have to take part?

No – it is up to you whether or not to take part in the study. If you decide to you will be given this information sheet to keep and will be asked to sign a consent form. After this you are still free to withdraw from the research at any time without giving a reason and without consequence. A decision not to take part or to withdraw later on will not disadvantage you in any way, and will have no impact on the care you receive here. If you withdraw from the study you may request that we destroy all data that has been collected about you. Before you consent to take part in the study, we will ask you whether you give consent for us to use the data we have already collected about you should you lose the capacity to give consent during the study (i.e. if you become too unwell to give consent). If you do not wish to agree to this, we will destroy the data we have collected about you once you lose the capacity to consent.

It is up to you to decide whether to take part or not. If you decide to take part you are still free to withdraw at any time and without giving a reason.
What will the study involve?

Taking part in this study will involve meeting members of the research team for a minimum of 4 sessions, lasting approximately 4-5 hours in total. We can schedule more sessions with you if you’d prefer to break it down into shorter sessions, and you can take breaks in the sessions if you would like. In one of the sessions you will be asked to attend the psychophysiology lab in the [location] where you will complete three tasks. These three tasks require you to wear headphones which sometimes deliver a short, loud burst of white noise. In one you will be asked to look at some highly unpleasant, highly pleasant and neutral pictures. In another task we will require you to use some physical exertion (pushing a heavily-sprung joystick). In the final one we will ask you to just sit still in a chair whilst wearing the headphones. As part of this session we will ask you to wear six small electrodes; four underneath your eyes (2 under each eye) and one behind each of your ears. The electrodes do not hurt and will simply stick to your skin.

The next two sessions will involve some tasks relating to things like your memory, attention, etc. In one session we will complete ‘pencil and paper’ tasks and in the next session we will complete computer tasks. For one of the computer tasks we will ask you to wear a headband for approximately 20 minutes, which will monitor your activity through the task. These two sessions should take about 1 hour and 10 minutes each, although for some people this will be shortened because you may have already done some of the tasks with your psychologist.

We will ask you to complete 3 short questionnaires about yourself and your feelings about being here at [location]. We will also ask a member of your clinical team to fill in three short questionnaires about your behaviour and symptoms, and with your permission we will take some information from your file for the purposes of this research only.

Benefits of taking part

Although there are no direct benefits to taking part, you can decide whether you would like the results from the assessments you have done as part of this research to be shared with your clinical team – if you decide to do this then your clinical team will have the information available which may help them make decisions about your care. You do not have to do this, it is entirely optional. Once all the assessments have been conducted you will receive £30 as a contribution for your time.

Risks of taking part

There are no expected major risks of taking part however some of the assessments may be sensitive for some people. In one of the experiments we will ask you to look at some pictures which are considered very pleasant by most people, and also to look at some pictures which are considered very unpleasant by most people. However, this will be different for different people and, if necessary, you will be offered support and advice from the research team and your clinical team. Some of the experiments involve using a loud burst of white noise delivered through headphones. Most people find this uncomfortable but not painful, and there should be no long-lasting effects. We would also like to place some small electrodes on your skin in some of the experiments (under your eyes and behind your ears), but these are not painful or intrusive and will simply stick to your skin. A researcher will be available to answer questions and discuss the research with you. If you wish to stop your participation in the study at any point you may do so without giving a reason and without consequence. This will not affect your medical care in any way.
If you are unhappy with any aspect of the research you have taken part in, you can contact Veena Kumari whose contact details are at the bottom of this page.

Confidentiality

All information collected will be anonymous and strictly confidential. However, if you would like us to share the results of your participation (i.e. the results from the assessments) with your clinical team then we will do this – this may be helpful for them in planning your care. You do not have to consent to this, and if this is the case then information you provide will not be shared outside the research team unless it is relevant to your safety or the safety of someone else, in which case this will be reported to your clinical team. Consistent with the policy, after each meeting with the research team a short entry will be made in your Multi-Disciplinary Team notes to record that you have taken part in the research, and giving a brief description of your behaviour and presentation.

The procedures for handling, processing, storing and destroying data are compliant with the Data Protection Act 1998. Data will be collected with only a participation number to identify it. Information linking participation numbers and patient names will be locked away and only researchers will have access to this for the purpose of collecting file data. Data will be stored securely for 10 years. Your participation is voluntary. If you change your mind, you are free to stop your participation and to have your data withdrawn without giving any reason.

What happens to my information?

The research data will be analysed by a research group at the Institute of Psychiatry. The results will be used to assist with the development of better services. A report of the study findings can be sent to you once the research has been completed.

Results will be written up as part of a doctoral (PhD) educational project, will be submitted to academic journals for publication and will be discussed at professional conferences. Participants in the research will not be identifiable in any reports, journal articles or presentations. Further information on the research can be sought from the research team.

Who is conducting the research?

This research is being carried out by researchers from the Institute of Psychiatry, King’s College London.

Contact Details

If this study has harmed you in any way you can contact Professor Veena Kumari at the Institute of Psychiatry, on 0207 8480233
Appendix E: Anonymised copy of patient consent form

**CONSENT FORM FOR PATIENTS**

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

*Characterisation of, and prediction of clinical outcomes in, mentally disordered offenders.*

Thank you for considering taking part in this research. The person organising this research **must** explain the project to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

**Please tick or initial**

- I agree to take part in this research study. I have read the information sheet, or had it read to me, and I have been given a copy to keep. I understand that after each meeting with the research team they will write a short entry in my notes to let my clinical team know I have taken part, and describing my behaviour and presentation during the session.

- I consent to information from my file being viewed by members of the research team and used for the purposes of this research only.

- I consent to the processing of my personal information for the purposes explained to me. I understand that such information will be handled in accordance with the terms of the Data Protection Act 1998.

- I consent that information collected about me can be anonymously stored for up to 10 years.

- I understand that I am free to stop my participation in the study without giving a reason and that if I decide to do so then I can request that all information collected from my participation be destroyed.

**Optional further consent** (if you do not consent to the following items you may still take part in this study):

- If during my participation, I lose capacity to give consent, I consent for the researchers to use the data they have already collected about me.

- I consent that the results of the assessments carried out as part of this research can be shared with my clinical team.

- I would like to be sent information on the outcome of the study when the study is over.

- I consent to being approached by researchers about future research.
Participant’s Statement

I ……………………………………………………………………… agree that the research study named above has been explained to me to my satisfaction and I agree to take part. I have read this consent form and the Information Sheet about the project and understand what the research study involves.

Signed ……………………………………………………………… Date……………………………

Researcher’s Statement

I …………………………………………………………………… confirm that I have carefully explained the nature, demands and foreseeable risks (where applicable) of the proposed research to the participant.

Signed ……………………………………………………………… Date……………………………
INFORMATION SHEET FOR CONTROLS

YOU WILL BE GIVEN A COPY OF THIS INFORMATION SHEET

Characterisation of, and prediction of clinical outcomes in, mentally disordered offenders.

We would like to invite you to participate in this original research project, which is being carried out as part of an educational PhD qualification. This research has been reviewed and approved by the Camberwell St Giles Research Ethics Committee. You should only participate if you want to; choosing not to take part will not disadvantage you in any way. Before you decide whether to take part, it is important for you to understand why the research is being done and what your participation will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or you would like more information.

The aim of the research

The main aim of this research is to see which characteristics are associated with doing well here at Broadmoor Hospital. It is likely that some groups of people (e.g. people with a specific diagnosis) are more responsive to the treatments offered here than other groups. This research will aim to identify which people are doing well at Broadmoor and responding well to treatment, and those who are not. We hope that this information will help us to develop new treatment targets in the future for those people who maybe aren’t doing so well.

Why am I being asked to take part?

We are inviting non-clinical staff across the hospital to take part, so that we have an idea of what the scores from the assessments would look like in a population who are not mentally disordered offenders.

Do I have to take part?

No – it is up to you whether or not to take part in the study. If you decide to you will be given this information sheet to keep and will be asked to sign a consent form. After this you are still free to withdraw from the research at any time without giving a reason and without consequence. A decision not to take part or to withdraw later on will not disadvantage you in any way. If you withdraw from the study you may request that we destroy all data that has been collected about you.

It is up to you to decide whether to take part or not. If you decide to take part you are still free to withdraw at any time and without giving a reason.

What will the study involve?

Taking part in this study will involve meeting members of the research team for a minimum of 4 sessions, lasting approximately 4-5 hours in total. We can schedule more sessions with you if you’d prefer to break it down into shorter sessions, and you can take breaks in the sessions if you would like. In one of the sessions you will be asked to attend the psychophysiology lab in the ……………, where you will complete three tasks. These three tasks require you to wear headphones which sometimes deliver a short, loud burst of white noise. In one you
will be asked to look at some highly unpleasant (e.g. injured bodies, pointed gun), highly pleasant (e.g. food items, opposite sex, babies) and neutral (everyday items) pictures. In another task we will require you to use some physical exertion (pushing a heavily-sprung joystick). In the final one we will ask you to just sit still in a chair whilst wearing the headphones. As part of this session we will ask you to wear six small electrodes; four underneath your eyes (2 under each eye) and one behind each of your ears. The electrodes do not hurt and will simply stick to your skin.

The next two sessions will involve some tasks relating to things like your memory, attention, etc. In one session we will complete ‘pencil and paper’ tasks and in the next session we will complete computer tasks. For one of the computer tasks we will ask you to wear a headband for approximately 20 minutes, which will monitor your activity through the task. These two sessions should take about 1 hour and 10 minutes each.

We will also ask you to fill in a short questionnaire about your attitudes to violence, and we will conduct a short interview with you regarding your mental health and wellbeing.

**Benefits of taking part**

There are no immediate benefits of taking part, although it is hoped that the results of this research will be useful in planning and developing novel treatment targets for mentally disordered offenders. Once all the assessments have been conducted you will receive £30 as a contribution for your time.

**Risks of taking part**

There are no expected major risks of taking part however some of the assessments may be sensitive for some people. In one of the experiments we will ask you to look at some pictures which are considered very pleasant by most people, and also to look at some pictures which are considered very unpleasant by most people. However, this will be different for different people and, if necessary, you will be offered support and advice from the research team. Some of the experiments involve using a loud burst of white noise delivered through headphones. Most people find this uncomfortable but not painful, and there should be no long-lasting effects. We would also like to place some small electrodes on your skin in some of the experiments (underneath your eyes and behind your ears), but these are not painful or intrusive and will simply stick to your skin. A researcher will be available to answer questions and discuss the research with you. If you wish to stop your participation in the study at any point you may do so without giving a reason and without consequence.

If you are unhappy with any aspect of the research you have taken part in, you can contact Veena Kumari whose contact details are at the bottom of this page.

**Confidentiality**

All information collected will be anonymous and strictly confidential. The information you provide will not be shared outside the research team **unless it is relevant to your safety or the safety of someone else**, in which case this will be reported.

The procedures for handling, processing, storing and destroying data are compliant with the Data Protection Act 1998. Data will be collected with only a participation number to identify it. Information linking participation numbers and names will be locked away and only researchers will have access to this. Data will be stored securely for 10 years. Your participation is
voluntary. If you change your mind, you are free to stop your participation and to have your data withdrawn without giving any reason.

What happens to my information?

The research data will be analysed by a research group at the Institute of Psychiatry. The results will be used to assist with the development of better services. A report of the study findings can be sent to you once the research has been completed.

Results will be written up as part of a doctoral (PhD) educational project, and will be submitted to journals for publication and will be discussed at professional conferences. Participants in the research will not be identifiable in any reports, journal articles or presentations. Further information on the research can be sought from the research team.

Who is conducting the research?

This research is being carried out by researchers from the Institute of Psychiatry, King’s College London.

Contact Details

If this study has harmed you in any way you can contact Professor Veena Kumari at the Institute of Psychiatry, on 0207 8480233
Appendix G: Anonymised copy of control consent form

**CONSENT FORM FOR CONTROLS**
Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

**Characterisation of, and prediction of clinical outcomes in, mentally disordered offenders.**
Thank you for considering taking part in this research. The person organising this research must explain the project to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

**Please tick or initial**

- I agree to take part in this research study. I have read the information sheet, or had it read to me, and I have been given a copy to keep. ☐
- I consent to the processing of my personal information for the purposes explained to me. I understand that such information will be handled in accordance with the terms of the Data Protection Act 1998. ☐
- I consent that information collected about me can be anonymously stored for up to 10 years ☐
- I understand that I am free to stop my participation in the study without giving a reason and that if I decide to do so then I can request that all information collected from my participation be destroyed. ☐

**Optional further consent** (if you do not consent to the following items you may still take part in this study):

- I would like to be sent information on the outcome of the study. ☐
- I consent to being approached by researchers about future research. ☐

**Participant’s Statement**
I …………………………………………………………………… agree that the research study named above has been explained to me to my satisfaction and I agree to take part. I have read this consent form and the Information Sheet about the project and understand what the research study involves.

Signed ………………………………………………………… Date…………………………

**Researcher’s Statement**
I …………………………………………………………………… confirm that I have carefully explained the nature, demands and foreseeable risks (where applicable) of the proposed research to the participant.

Signed ………………………………………………………… Date…………………………
Appendix H: Anonymised copy of R&D approval letter

### Forensic Clinical Research Domain [FRED] - Research Protocol

This protocol should be completed and signed by the ___ PI or, for multi-site studies that are externally led, by the ___ SSPI. The protocol will be considered and authorised by the ___ FRED committee. It should be submitted to ___ at least two weeks prior to the ___ FRED meeting.

### DETAILS OF PROPOSED STUDY LEADERSHIP

<table>
<thead>
<tr>
<th>DATE</th>
<th>19/11/13</th>
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</thead>
<tbody>
<tr>
<td>PRINCIPLE INVESTIGATOR</td>
<td>Professor Veena Kumari</td>
</tr>
<tr>
<td>PI department/directorate</td>
<td>Psychology Department, Institute of Psychiatry, King's College London</td>
</tr>
<tr>
<td>PI contact address</td>
<td>Psychology P078, Institute of Psychiatry P078, De Crespigny Park, Kings College London, SE5 8AF</td>
</tr>
</tbody>
</table>
| PI telephone and email | Tel: 0207 848 023  
Email: veena.kumari@kcl.ac.uk |
| SITE SPECIFIC PI (local lead if PI is external to FRED) | Otilie Sedgwick, PhD Student |
| SSPI department/directorate | Department of Psychology, Institute of Psychiatry, King's College London |
| SSPI contact address | Psychology P078 (4th Floor), Institute of Psychiatry P078, De Crespigny Park, Kings College London, SE5 8AF |
| SSPI telephone and email | Tel: 01344 744316  
Email: otilie.sedgwick@kcl.ac.uk |
| Names and contact details (including email) of all coresearchers | Dr Mrigendra Das –  
Dr Susan Young – susvyoung@aol.com  
Dr. Ailin Parsons – a.r.parsons@surrey.ac.uk |

### TITLE OF PROJECT

Characterisation and prediction of treatment outcomes in mentally disordered offenders

### DETAILS OF PROPOSED STUDY

**RESEARCH DESIGN**

- Exploratory Study
- Hypothesis Driven
- Pilot Study

**STUDY DESIGN** *(for mixed methods check all applicable)*

- Systematic review/meta-analyses
- Experimental evaluation (i.e. randomised controlled trial)
- **Quasi-experimental evaluations (i.e. non-randomised controlled trial)**
- Non experimental evaluations (i.e. case controlled study, cohort study, survey)
- Qualitative Research

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*Unsure whether it is research? Go to www.bja-decisiontools.org.uk/research*
### RESEARCH QUESTION(S)
Specify research question(s) (or details of exploratory research and justification for enquire).

Study 1: The main objective is to characterise, over a period of 12-18 months, all consenting patients residing in [ HACKED ] (it houses, on average, 250-300 patients) on a range of experimental, psychophysiological, neuropsychological and psychometric measures, and examine them according to their primary diagnosis (schizophrenia, APD or dual diagnoses).

Study 2: The main objective is to investigate the relationship between sample characteristics (both categorical (e.g. primary diagnosis), and continuous (e.g. level of psychopathy]) and clinical outcomes in a retrospective design in patients with a hospital stay of 6 months or more at the time of their participation (a sub-sample of Study 1 patient sample).

Study 3: The main objective of this pilot study is to examine the relationship between pre-therapy sample characteristics and short-term clinical outcome (6-12 months). This pilot study will also involve a sub-sample of Study 1, and include only those who were newly admitted (<3 months) to the [ HACKED ] during the first 12 months of this project and tested on various sample characterisation measures of Study 1. On average, around 50 new patients get admission to

### HYPOTHESES
For hypothesis driven research, specify the hypothesis for each research question listed above.

This is exploratory research.

### METHODS
Provide brief details of your study methods: including type of participants, sample size, measures and procedure.

**Sample and Design**
A minimum of 80 patients over a period of 12-18 months (maximum, as many as consent and can be tested within the allowed time frame of a PhD project) will be recruited from within [ HACKED ] and characterised using a range of measures (described below). In addition, a group of 30 healthy individuals, matched on average to the age and premorbid IQ of patients, will be recruited from the general population and tested for comparison purposes.

Participants will complete the following measures detailed in the proposed sessions below.

#### Proposed measures and sessions:

**Session 1**
- **Location:** Psychophysiology lab
  - Prepulse Inhibition (PPI) 15 min
  - Affective Startle 30 min
  - Joystick Operated Runway Task (JORT) 20 min

  **TOTAL TIME:** 65 min

**Session 2**
- **Location:** Ward
  - Wechsler Adult Intelligence Scales IV – Vocabulary & Matrix Reasoning subtests 25 min
  - Trails Parts A & B 4 min
  - Hopkins Verbal Learning Test (HVLT-R) 10 min
  - Letter Number Task 5 min
  - Verbal Fluency, Category Fluency 6 min
<table>
<thead>
<tr>
<th>Schedule</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wechsler Memory Scale (WMS-IV) Visual Memory subtest</td>
<td>5 min</td>
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<td>National Adult Reading Test (NART)</td>
<td>5 min</td>
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<tr>
<td>Digit Span</td>
<td>5 min</td>
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<td>BADS Key Search</td>
<td>2 min</td>
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<td>BADS Zoo Map</td>
<td>10 min</td>
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<td><strong>TOTAL TIME</strong></td>
<td>75 min</td>
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**Session 3**

**Location: Ward (Features Required)**

- Emotional Strength
- Wisconsin Card Sorting Task (WCST) 20 min
- Emotional Perception Task          10 min
- Iowa Gambling Task                 10 min
- Continuous Performance Test (CPT) 15 min

**TOTAL TIME:** 60 min

**Session 4**

**Location: Ward**

- Edinburgh Handicaps Inventory         2 min
- Patient Motivation Inventory          5 min
- Patient Perception Questionnaire     5 min
- Maudsley Violence Questionnaire      5 min
- Change Blindness Task                10 min
- Visual Search Task                   10 min

**TOTAL TIME:** 37 min

Following completion of the above measures and extraction of relevant information from participants’ case file (e.g., level of psychopathy, history of childhood trauma, substance use etc.), additional outcome measures will be compiled and used for analysis.

**Outcome measures:**

**Risk Reduction**

1. Health of the Nation Outcome Scales - Secure Version (HONOS-Secure) (Sugarman and Walker, 2004). This scale allows the outcome of clinical risk assessment to be rated in terms of need for care and need for clinical risk management procedures.
2. Risk Assessment: Continuous outcome using the HCR-20 clinical and risk scales (Douglas et al., 2001)

**Global State/Functioning**

1. Continuous outcome, measured through improvement on the Global Assessment of Functioning numeric scale (GAF; APA 2000).
2. Clinical Measure of Current Functioning (devised for the purposes of this research). This measure will include Clinical Global Impression (CGI), level of dependency, number of seclusions, engagement with MDT etc.

**Behavioural**

1. Reduction in number of all aggressive incidents measured by examining the patient’s records as described in Study 1.
2. Disruptive Behavioural and Social Problem Solving Scale (DBSP), an informant measure, as described in Study 1.
3. Staff Observation of Aggression Scale Revised (SOAS-R), a measure of incident frequency and severity, as described in Study 1.
### Statistical Analysis

Describe proposed analysis.

Differences in characteristics of good and poor outcome subgroups and the association between patient characteristics and treatment outcome will be examined using categorical (e.g., t-tests or analysis of variance (ANOVA); for experiments with more than one task conditions) with good versus poor outcome groups] and continuous (e.g., regression on continuous outcome variables) data analytic approaches as appropriate following the methods used in our recent studies (Kumari et al., 2009, Biol Psychiatry; Kumari et al., 2012, Schiz Rev; Premkumar et al., 2009, Schiz Rev). Characteristics of good and poor outcome subgroups would also be compared with those of the healthy group using ANOVAs followed by post-hoc group comparisons.

### Power Calculation

For statistics based on parametric assumptions, provide a power calculation for your study and associated details (including full reference for study on which calculation is based).

Based on previous research by the supervisors on [redacted] patients (e.g., Kumari et al., 2006, Schiz Rev; Kumari et al., 2009, Schiz Rev), 15-20 participants/group are likely to be sufficient to demonstrate a significant (p≤0.05) group difference in at least some variables of interest. However, the focus of this study is also on estimating relative effect sizes for different measures in differentiating the groups of interest and on finding out the most robust and relevant measures (out of a larger pool of potentially useful psychophysiological and behavioural measures, with possible redundancy amongst them) to characterise offenders in future studies.

### Details of Ethical Approval Status

- [ ] Ethical approval awarded (give date and reference):
- [ ] Ethical approval applied for
- [ ] Ethical approval required but not yet applied for
- [ ] Ethical approval not required (give reason):

### Details of Funding

Provide details of funding status

- [ ] NIHR funding awarded (give date and details): Funding received as part of NIHR BRC mental health 4 Yr studentship (1 Yr Msc+3 Yr PhD). Funding commenced September 2012.
- [ ] Other funding awarded (give date and details):

- [ ] MHRN adopted (give date and details):

- [ ] Funding applied for (give date and details):

- [ ] [redacted] department/own account funded

### Outcomes

Specify planned outcome objectives of conducting this study

- [ ] To gain pilot data for future grant proposal (give details of proposed funding application):
- [ ] Publication in peer reviewed scientific journal

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* Not sure what Power is? Go to [www.statsoft.com/textbook/power-analysis](http://www.statsoft.com/textbook/power-analysis)
Need a power calculator? Go to [www.psych.uni-duesseldorf.de/de-buchengem/aap/gpower3](http://www.psych.uni-duesseldorf.de/de-buchengem/aap/gpower3)

* Unsure if ethics is required? Go to [www.hra-decisiontools.org.uk/ethics](http://www.hra-decisiontools.org.uk/ethics)
To obtain ethics form, go to [www.nresform.org.uk](http://www.nresform.org.uk)
Internal report

External conference presentation (please specify):
Meeting of the European Psychiatric Association and other relevant societies.

Internal conference presentation (please specify):
Findings of this research study will be disseminated at relevant conferences both within the NHS trust and at academic conferences.

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** AGREEMENTS **

Please check your agreement to each of the following:

- I agree that this research will be conducted in accordance with relevant data protection policies and procedures and information governance.

- I agree that any data collected for this research will remain the property of [insert] and will be retained for a minimum of ten years.

- At the end of the research study I agree to provide copies of the data to [insert] FRED where it will be logged and stored in its data archive.

- I agree that data will remain on Trust Property and will only used elsewhere following appropriate permissions/confidentiality agreement

---

** SIGNATURE **

SIGNATURE OF LOCAL LEAD (i.e. PI or SSPI)

[Signature]

PRINT NAME

OTTILIE SEDGWICK

DATE

19/11/13

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** FOR INTERNAL FRED USE **

DATE RECEIVED

19/11/13

DATE CONSIDERED

21/11/13

OUTCOME

- Authorised and sent to R&D on (date): 12/12/13

- Request for further information sent on (date):

- Declined with feedback on (date):
Appendix I: Histograms for analyses

**Figure 1**: Distribution of patients' predicted FSIQ

**Figure 2**: Distribution of controls' predicted FSIQ
Figure 3: Distribution of patients’ estimated current IQ

Figure 4: Distribution of controls estimated current IQ
**Figure 5:** Distribution of patients PCL-R scores

**Figure 6:** Distribution of patients total emotion recognition accuracy scores
Figure 7: Distribution of controls’ total emotion recognition accuracy scores

Figure 8: Distribution of patients’ total emotion discrimination accuracy scores
Figure 9: Distribution of controls’ total emotion discrimination accuracy scores

Figure 10: Distribution of patients’ JORT total fear scores
Figure 11: Distribution of controls’ JORT total fear scores

Figure 12: Distribution of patients’ JORT total anxiety scores
Figure 13: Distribution of controls’ JORT total anxiety scores
MRP proposal
Title: ‘Characterising Emotion Processing, Fear and Anxiety in Mentally Disordered Offenders’.

Submitted: 2nd September 2013

Word count: 2948 words (excluding references & appendices)

Specified portfolio corrections made to this proposal
Introduction

Background and theoretical rationale

Violent offending has a high cost to society, is prevalent in the United Kingdom and across the world, and impacts many sectors of the economy including legal and healthcare. Determining what underpins violent behaviour is therefore necessary in order to develop appropriate preventative interventions and strategies. Dysfunction in processing and regulation of emotion is thought to underlie violent offending (Blair, 1995). According to research, disorders relating to violence and aggression are reportedly underpinned by emotion regulation deficits at a neural level (Davidson, Putman, & Larson, 2000). These differences have been located in areas of the brain linked with self-reference, self-reflection and emotion recognition of others (Bertsch et al., 2013). Deficits in emotion recognition have been demonstrated among violent offenders who took part in experimental research studies (Robinson et al., 2012).

Emotion processing has also been investigated among individuals with psychological disorders. A meta-analytic review (Kohler, Walker, Martin, Healey, & Moberg, 2010) highlighted significant impairment in negative facial emotion recognition among individuals with schizophrenia compared to controls, and cited a large effect size. A significantly higher level of violent crime is likely to be carried out by individuals who have psychological disorders compared to individuals who do not have psychological disorders, according to community research studies (Elbogen & Johnson, 2009).

Research has also reported that offenders differ in how they experience fear states compared to controls. This difference theoretically leads to offending behaviour as
no punishment response is experienced (Herpertz & Sass, 2000). A reduced experience of fear has been found in mentally disordered offenders viewing aversive images compared to healthy non-criminal controls (Wahlund, Sorman, Gavazzeni, Fischer, & Kristiansson, 2010).

Although related to the concept of fear, anxiety is a neurobiologically distinct mechanism characterised as a pervasive mood state elicited in response to a distal and/or potential threat, in contrast to imminent danger as in fear (Davis, Walker, Miles, & Grillon, 2010). The available literature regarding deficient anxiety responding in relation to offending is mixed in its findings. Some research has found a lack of anxiety significantly related to psychoticism (Heym & Lawrence, 2010) whereas Kumari et al. (2009) have shown excessive anticipatory anxiety in a group of schizophrenia patients with a history of serious violence, suggesting this may not be a global deficit in all offenders.

Elevated levels of psychopathy, a severe personality disorder characterized by impairment in relation to empathy and anti-social behaviour that has been shown to be related to emotion processing deficits among violent offenders, have been reported among mentally disordered offenders, particularly among offenders with bipolar disorder, anti-social personality disorder (ASPD) and substance use disorder (Soderstrom, Nilsson, Sjodin, Carlstedt, & Forsman, 2005). Empirical research studies have also highlighted significant co-morbidity between psychotic disorders, such as schizophrenia, and psychopathy within forensic samples and suggest that it is unlikely that Axis I and Axis II disorders occur independently (Blackburn, Logan, Donnelly & Renwick, 2003). However there has been little research to date that has
explored the relationship between psychopathy and emotion processing among mentally disordered offenders.

A review of the available literature revealed eight studies that examined how psychopathy is related to deficits in emotion processing both among offenders with psychological disorder and as a mediating factor within mentally disordered offenders (see appendix A). Specifically, seven of the studies focused on the relationship between psychopathy and other types of personality disorder for emotion processing (Anton et al., 2012; Dollan & Fullam, 2005, 2006; Domes, Mense, Vohs, & Habermeyer, 2012; Herpertz et al., 2001; Kosson, Lorenz, & Newman, 2006; Verona, Sprague, & Sadeh, 2012). Only one study used a sample of offenders with another psychological disorder, schizophrenia, to explore the mediating role of psychopathy for emotion processing among offenders (Fullam & Dolan, 2006). Most studies reported a significant contribution of psychopathy, independent of other psychological or personality disorders, for emotion processing deficits among offenders. This review highlights the lack of research in this area and further recommends specific research questions in order to fulfil this gap in the literature.

A behavioural model of violent offending (Blair, 1995) suggests that the propensity to commit a violent act may be explained by the violence inhibition mechanism (VIM) model. This model proposes that a deficit in emotion perception is related to violent offending, particularly repeated violent offending. More specifically, it proposes that if an individual does not learn to accurately interpret emotion, for example facial expressions that are either sad or fearful, the negative behaviour that causes the negative facial expression of a victim does not then act as a ‘punishment’ behaviour for the perpetrator. This absence of a ‘punishment’ or
aversive reaction from the victim to violent behaviour may then lead to repeated violent offending or anti-social behaviour (Blair & Coles, 2000).

**Research questions**

1. Is there a difference in emotion processing between mentally disordered offenders with a history of violent crime and controls?
2. Is there a difference in induced fear between mentally disordered offenders with a history of violent crime and controls?
3. Is there a difference in induced anxiety between mentally disordered offenders with a history of violent crime and controls?
4. Are these differences mediated by the level of psychopathy, psychotic symptoms, intellectual ability, history of violence or history of childhood trauma?

**Main hypotheses**

1. There will be impaired processing of negative emotions in mentally disordered offenders with a history of violent crime to controls.
2. There will be impaired fear in mentally disordered offenders with a history of violent crime compared to controls.
3. There will be a difference in induced anxiety between mentally disordered offenders with a history of violent crime and controls, although the direction of this is unclear and thus this investigation will be exploratory.
4. Psychopathy will further impair the processing of fear and negative emotions. The literature surrounding anxiety is less clear, thus this area will be exploratory. Understanding the relative contribution of psychotic symptoms,
intellectual ability, history of violence or history of childhood trauma will also be exploratory.
Method

Participants

N=46 mentally disordered offenders with a history of violent crime recruited from a high secure hospital

N=46 controls. Controls will be members of the hospital staff. Controls will be matched for age, gender and estimated general intellectual ability. Participants will be matched at a group level for these variables.

A power analysis was conducted using emotion perception as the lead variable. Effect size was calculated using means and standard deviations from previous work examining reaction time in response to fear (Green, 2012), giving a medium effect size of 0.69. To obtain this same effect (α=0.05, 95% power), 46 group participants and 46 controls should be recruited.

Inclusion criteria

Patients at the high secure hospital with a history of violent crime will be eligible to participate in the current research based on clinical and forensic records and will include criminal convictions and judgements on non-responsibility due to mental illness or diminished responsibility. Violent crimes will be defined as offences that have caused physical harm, threats of violence or harassment, all types of sexual aggression, illegal possession of firearms or explosives, all types of forcible confinement, arson and robbery. These crimes will then be sub-grouped into sexual and non-sexual crimes.
**Exclusion criteria**

Controls that have direct contact with patients will be excluded from participating. Controls with a history of mental illness will also be excluded from participating.

**Expected response rate**

There are currently 196 patients at high secure hospital. It is estimated that up to 70% of the patient sample will be eligible to participate. We therefore anticipate that at least 30-40% of eligible participants will participate in order to achieve the sample size required.

**Design**

The study will employ a cross-sectional design to investigate differences between groups and a correlational design to determine the influence of psychopathy, psychotic symptoms, IQ, history of violence and history of trauma.

**Measures/interviews/stimuli/apparatus**

**Laboratory and emotion perception tasks**

Emotion Perception Task: This task will comprise of a series of standard facial affect photographs presented to participants via a laptop computer (a modified version of the task used by Premkumar et al., 2008). The faces will be digitally manipulated to show happy, sad, angry, surprised, fearful or neutral expressions at 50% or 100% intensity. The images will appear in a predetermined sequence and will consist of both male and female faces. On 50% of the trials, participants will be required to select the emotion they consider was displayed in the face from a menu.
of six possible choices (happy, sad, angry, surprised, fearful, neutral), and on the remaining trials to judge the intensity (more/less) of the displayed emotions. Choices made by the participants will be recorded in terms of accuracy and reaction time. This task will take about 12 minutes and is suitable for repeated testing. Both the patient group and control group will complete this task. Outcome variables consist of choices made by the participants on this task. Responses were recorded in terms of accuracy and response time by the computer programme.

Joystick Operated Runaway Task (JORT): JORT is a reliable probe of fear-anxiety differentiation (Perkins et al., 2009). In part one of this task, a cursor dot is pursued along an on-screen runway by a threat stimulus dot that inflicts an unpleasant but harmless 115 db burst of white noise upon the participant if it catches up. The participant controls the speed of the cursor along the runway using a custom made force-sensitive joystick that relates effort to speed in a naturalistic manner: the harder the joystick is pushed the faster the cursor travels along the runway. Importantly, participants must use considerable effort in order to reach escape velocity (each trial requires that they use at least 50% of their maximum strength, which is recorded in a preliminary calibration phase) meaning that the JORT is able to model under controlled conditions the high calorie cost of high speed escape from threat. In part one of the JORT, the participant is not required to approach the threat stimulus and can escape from it (fear). In part two, a second threat stimulus appears in front of the cursor, to create a situation in which all three dots moved along the runway in the same direction and so movement away from one threat automatically moved it towards the other. This traps the participant in conflict where they must approach threat, and hypothetically elicits anxiety, which is indexed by the degree of approach-withdrawal oscillation. This task takes about 20 minutes to complete and is
suitable for repeated testing. Both the patient group and control group will complete this task. The task elicits fear (the need to flee away from the target as fast as possible to avoid an unpleasant stimulus) and is measured as the difference between the velocity in the threat versus no threat condition. It also measures anxiety (a conflict about whether or not to approach the target to avoid an unpleasant stimulus) and is measured as the difference between the degree of approach-withdrawal oscillation across threat versus no threat conditions. Fear and anxiety, as measured by this task, will comprise outcome variables.

**Standardised measures**

- Psychopathy Checklist Revised – Screening Version (PCL-SV; Hare 1991) is a measure of psychopathy that uses two factors: Interpersonal and Affective (factor 1) and Impulsive Lifestyle and Anti-social Behaviour (factor 2) demonstrating internal reliability of .87 and .92 respectively among forensic samples. This will be completed for the patient group only.

- Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998) is a 25 item self report questionnaire that assesses history of childhood trauma along five factors including physical, emotion and sexual abuse, and physical and emotional neglect. Reliability coefficients range from .65 to .95 across the five scales in samples of offenders. This will be completed for the patient group only.

- Gunn and Robertson Scale (Gunn & Robertson, 1976) – assesses history of violence and severity of most recent violent act on likert scales form 0-4.
Reliability coefficient for the violence sub-scale is .94. This will be completed for the patient group only.

- Positive and Negative Syndrome scale (Kay et al., 1987), uses two scales to measure positive (scale 1) and negative (scale 2) symptoms of schizophrenia and reports reliability coefficients of .70 and .83 respectively. This will be completed for the patient group only.

- Positive and Negative Symptoms scale (PANAS; Watson et al, 1988), a measure of positive affect (factor 1) and negative affect (factor 2) and demonstrates internal reliability of .87 and .88 respectively. This will be completed for the patient group only.

- Wechsler Abbreviated Scale of Intelligence (Wechsler, 1999). The WASI (2 test version) provides an estimate of general intellectual ability and includes traditional composite IQ scores (verbal, performance and full scale). Both the patient group and control group will complete these tasks.

**Procedure**

**Recruitment procedure for clinical participants**

Clinical participants will be recruited from a high-security hospital. Responsible clinicians will be asked to identify patients who are eligible to be invited to participate based on their current mental state and current risk. Eligible patients will then be invited to participate by giving them verbal and written information about the current research and what is involved. Potential participants will be assured that participation is completely voluntary and deciding to not participate will not impact their clinical care. A signed informed consent form will be requested from
participants. This consent form will make it explicit that participants are also consenting for information from their clinical file will be used for the research study.

**Recruitment procedure for controls**

A poster will be designed to advertise the current research to staff at the hospital. This poster will be placed in staff common rooms and offices. Announcements will be made about the current research during staff meetings where a provisional sign up sheet will be circulated. A general e-mail will also be sent to staff from a third party with the information poster attached. Contact information will be provided. Staff will be requested to make contact via e-mail if they wish to participate and/or require additional information. Information sheets and consent forms will be given to interested potential participants. Potential participants will also be assured that their participation is voluntary and they can withdraw at any time.

**Testing environment for clinical participants and controls**

A designated research space will be allocated for the purposes of conducting the research. It will be ensured that this room is appropriate given the high-secure nature of the setting and that it is an adequate space for setting up the laboratory tasks. This allocated space will also be used for control participants to participate.

**Testing procedure for clinical participants**

An agreed time and date will be agreed based on the availability of both the participant and the member of staff who will be required to escort the participant to the testing room. Participants will take part in two laboratory and emotion perception tasks: the Emotion Perception Task and the Joystick Operated Runaway Task as described in the previous section. The WASI (two test version) will also be
administered to participants. After participants complete the tasks, the additional information required for the study will be obtained from a review of file information and a previous clinical interview conducted by a clinician.

**Testing procedure for controls**

An agreed time to participate will be agreed with control participants. The testing procedure using the laboratory, emotion perception and cognitive tasks will be the same for controls. We do not expect controls to have any criminal convictions since they would have been subjected to a Criminal Records Bureau check. Controls will be screened for a history of mental illness.

**Ethical considerations**

Significant emotion processing deficits may be uncovered, primarily among clinical participants. Individual performance outcomes will not be disclosed to participants and this will be detailed explicitly in the consent form. Participants will be advised that they will be provided about general feedback about the results of the research.

Every clinical participant is under the care of a clinical care team and they will be advised to discuss any concerns about their performance with their team. Control participants will be advised to contact their GP. This study is part of a larger study being conducted at the hospital. An NHS ethics application has been submitted for this study.
**R&D considerations**

The proposed high secure hospital has a rich research history. The R&D department has specifically approved this area of research. This current research will be part of a larger study that proposes to identify biomarker predictors and correlates of treatment outcomes in violent and sexual offenders. It is anticipated that patients will be taking part in a rehabilitation programme for which this research study is complementary.

Name of R&D department:

R&D department at the high secure hospital in the south of England.

**Proposed data analysis**

T-tests or one-way analysis of variance (ANOVA) will be used to assess differences between clinical participants and controls. The clinical group will form sub-groups characterised by the presence or absence of clinically elevated levels of psychopathy and will be compared to the control group (all controls are expected to be without clinical psychopathy). Analysis of variances (ANOVAs) and correlations will be used to further assess the effects of psychopathy, IQ, psychotic symptoms, history of violence and history of trauma (continuous approach) on variables of interest (emotion processing, fear and anxiety) for the clinical and control groups.
Service user and carer consultation/involvement

Due to the nature of the patient group it was not possible to do any consultation about the study design. However there will be opportunity to disseminate findings at a group level.

Feasibility issues

I will also be working closely with a PhD student as part of a wider ongoing research study at the site. She will be at the site 5 days per week and can assist with participant recruitment. Designated desk space for the days that I will be data collecting at the site has also been secured. An honorary research contract has also been secured which means that I have received a full induction and access to keys. This ensures ease of access to the site and will enable recruitment and data collection processes.

Dissemination strategy

Feedback of general study findings will be provided to clinical participants using a staff-patient feedback loop and to controls via e-mail. Results of the study will be presented at the hospital’s annual research conference in November 2015, the Division of Forensic Psychology annual research conference in June 2015, and the BPS annual conference in April 2016. Research articles will be submitted to peer-reviewed journals including ‘Aggression & Violent Behaviour’.
Study timeline

Figure 1: Gantt chart illustrating the timeline for the proposed study.

Signatures

University Supervisor (please print): Emily Glorney

Signature: [Signature]

Date: 16th August 2013
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MRP literature review
Title: The contribution of psychopathy to emotion processing in mentally disordered offenders

Word count: 7851 (excluding journal rationale and references)

Submitted: 29th April 2013
Abstract

Psychopathy and other psychological disorders have been linked with emotion processing deficits among violent offenders. The aim of this systematic literature review was to explore the literature in relation to how psychopathy is related to deficits in emotion processing both compared to offenders with psychological disorders and as a mediating factor among mentally disordered offenders. A systematic review of three databases PsychINFO, PubMed and ScienceDirect was conducted using key search terms and strict inclusion criteria. Eight studies were found that met all inclusion criteria and were conducted between 2001 and 2012. Most studies found focused on the relationship between psychopathy and personality disorder for emotion processing. Only one study used a sample of offenders with another psychological disorder (schizophrenia) and only one study used a sample of female offenders. Most studies reported some kind of significant contribution of psychopathy, independent of psychological or personality disorder, for emotion processing deficits among offenders. However findings were often limited to specific aspects of emotion processing or may have been complicated by additional attentional processes. Nonetheless, this review highlights the lack of research in this area and further recommends specific research questions in order to fulfill this gap in the literature.
**Introduction**

Violent offending is prevalent in the United Kingdom and across the world, has a high cost to society, and impacts numerous sectors of society such as the economy and healthcare. It is therefore essential to determine what underpins this behaviour in order to develop effective preventative strategies and interventions. One characteristic that is thought to underlie violent offending is a deficit in emotion processing (Blair, 1995).

**Theory of emotion processing deficit to explain violent offending**

One theory offered by Blair (1995), a behavioural model of violent offending, suggests that the propensity to commit a violent act may be explained by the violence inhibition mechanism (VIM) model. This model proposes that a deficit in emotion perception is related to violent offending, particularly repeated violent offending. More specifically, it proposes that if an individual does not learn to accurately interpret emotion, for example facial expressions that are either sad or fearful, the negative behaviour that causes the negative facial expression of a victim does not then act as a ‘punishment’ behaviour for the perpetrator. This absence of a ‘punishment’ or aversive reaction from the victim to violent behaviour may serve to fail to inhibit an individual with such emotion processing deficits from inflicting harm or violence on others in the future, and may then lead to repeated violent offending or anti-social behaviour (Blair & Coles, 2000). Blair’s (1995) theory of violent offending appears to provide an account of repeated violent offending but it is unclear whether or not it can account for reactive or impulsive violent offending.
Emotion regulation deficits among violent offenders

Research suggests that dysfunctional emotion regulation at a neural level underlies disorders relating to violence and aggression (Davidson, Putman, & Larson, 2000). Brain imaging research has further suggested that violent offenders may differ in relation to brain volume in areas of the brain linked with processing of emotion depending on symptoms of psychopathy compared to other psychological disorders such as borderline personality disorder (Bertsch et al., 2013; see also Wahlund & Kristiansson, 2009 for a review). These differences have been reported in areas of the brain associated with self-reference, self-reflection and the recognition of the emotion of others (Bertsch et al., 2013). Experimental research studies have also demonstrated that offenders exhibit deficits in emotion recognition. For example, Robinson et al. (2012) found that a sample of offenders exhibited significant deficits in a facial affective recognition task compared to non-offender IQ matched controls who were required to accurately interpret a range of facial expressions such as anger, fear, sadness and disgust.

Dysfunctional emotion processing in psychological disorder

Emotion processing has also been explored in individuals with psychological disorders. A meta-analytic review that focused on facial emotion perception reported significant impairment in negative facial emotion recognition among individuals with schizophrenia compared to controls, citing a large effect size (Kohler, Walker, Martin, Healey, & Moberg, 2010). Hooker & Park (2002) also report emotion processing deficits in both affective word recognition and facial recognition among individuals with schizophrenia compared to controls.
Community research studies have reported that a significantly higher level of violent crime is committed by individuals with psychological disorders compared to individuals who do not have psychological disorders (Elbogen & Johnson, 2009). Research has also suggested that individuals with schizophrenia and other types of psychotic disorders are more likely to commit violent crimes compared to individuals with other types of psychological disorders (Eronen, Angermeyer & Schulze, 1998). Empirical research has also shown that offenders with psychological disorders, without psychopathy, have been shown to differ significantly from non-offending controls on measures of emotional arousal using psychophysiological measures (skin conductance response) relating to emotional visual stimuli (Wahlund, Sorman, Gavazzeni, Fischer, & Kristiansson, 2010).

**The association between psychopathy and dysfunctional emotion processing**

Psychopathy may be characterized as a personality disorder that is severe in nature and comprises antisocial behaviour impairments in relation to empathy (Hare, 2003). Numerous studies have reported that offenders with high levels of psychopathy symptoms exhibit marked deficits in the processing of various types of emotional stimuli and have used tasks such as facial recognition, affective word recognition and audio recognition of emotional stimuli when assessing emotion processing.

**Psychopathy and facial and vocal recognition tasks**

Dawel, O’Kearney, McKone, & Palermo (2012) conducted a meta-analysis of facial and vocal recognition deficits associated with psychopathy. Overall, the review highlighted that psychopathy was associated with significantly poorer recognition of
facial emotions, regardless of expression type (Dawel et al., 2012). The largest
deficits in facial emotion processing were reported for fear, happiness, sadness and
surprise, but not for anger or disgust (Dawel et al., 2012). However, it must be noted
that this meta-analysis specifically excluded any studies that included participants
who had a history of any pervasive psychological disorder such as schizophrenia.
Munro et al. (2007) also showed that error rates for facial recognition of fearful and
angry faces among violent offenders was predicted by level of their psychopathy
traits while Bagley, Abramowitz, & Kosson (2009) reported significant deficits in
vocal affect recognition between offenders with psychopathy compared to controls.

**Psychopathy and word recognition tasks**

Offenders with high levels of psychopathy have also exhibited emotional word
processing deficits. For example, Lorenz & Newman (2009) administered a lexicon
decision task to a sample of 100 offenders who formed the groups: low-anxious
psychopaths, low-anxious control offenders, high-anxious psychopaths and high-
anxious control offenders. The study found that the low-anxious psychopath group
exhibited significantly lower emotional facilitation compared to the low-anxious
control offender group. When compared across which hand was used in the task, the
study reported that the low-anxious psychopath group showed significantly less
frequency facilitation than low-anxious control offenders when examined for their
right hand but this difference was not found when using the left hand. This finding
has been implicated in brain imaging research.

**Psychopathy and physiological marker of arousal**

Verona, Patrick, Curtin, Bradley, & Lang (2004) found a significant main effect
of Factor 1 (interpersonal/affective) of the PCL-R measure of psychopathy for skin conductance response (SCR) when administering a series of affective audio clips to a sample of offenders. Levels of SCR were lower among psychopathic offenders for all affective sounds compared to non-psychopathic offenders. Added to this, participants who recorded high levels on Factor 1 of the PCL-R exhibited significant impairments when differentiating between neutral and affective audio clips (Verona et al., 2004).

Psychopathy and brain imaging

Neuro-cognitive differences have been reported between offenders with high levels of psychopathy compared to offenders without psychopathy and controls. Areas of the brain, particularly the limbic and paralimbic structures that include the orbito-frontal cortex and the amygdala, have been implicated in differentiating psychopaths from control offenders (see Kiehl, 2006 for a review). For example, Kiehl et al. (2001) conducted a study comparing psychopathic offenders, control offenders, and controls using an affective word processing task. Although the study found no differences in recall of affective words, it was reported that psychopathic offenders displayed significantly less activation in brain regions related to emotion compared to both control offenders and controls. The study reported no differences in neural activity for neutral word processing between the groups (Kiehl et al., 2001).

No effect of psychopathy among offenders

Some studies have reported no impact of level of psychopathy on the processing of emotional stimuli. For example, a facial affect recognition task was administered to a sample of offenders who were also assessed for level of psychopathy using the
PCL-R (Glass & Newman, 2006). Participants were divided into high- and low-psychopathy. No psychopathy-related deficits in facial affect recognition were reported in this study across angry, fearful, sad or happy facial expressions.

**Mediating role of attention process in psychopathy-related emotion deficits**

Some research studies have claimed that attention-related deficits underlie the reported emotion processing impairment associated with high levels of psychopathy. For example, in a sample of 87 male offenders from a high secure prison who completed an instructed fear conditioning task under four conditions (Early/late threat focus, early/late alternative focus), Baskin-Sommers, Wallace, MacCoon, Curtin, & Newman (2012) reported that offenders with high levels of psychopathy exhibited impairments in emotion processing under conditions where the threat was not the main focus of the task. Specifically, this study found a significant negative relationship between psychopathy and fear-potentiated startle (FPS) in the early-alternative focus condition suggesting that attention deficits may mediate the link between psychopathy and emotion processing impairment among offenders.

Similarly, Newman, Curtin, Bertsch, & Baskin-Sommers (2010) also found that the contribution of high levels of psychopathy to impaired fear-potentiated startle (FPS) was mediated by attentional focus. Particularly, Newman et al. (2010) also reported no significant relationship between psychopathy and FPS in the threat-focused condition whereas a significant negative relationship between psychopathy and FPS was found in the alternative focus condition.

**The role of psychopathy among offenders with psychological disorders**

Elevated levels of psychopathy have been reported among mentally disordered
offenders, and research has suggested that high levels of psychopathy is particularly associated with offenders with bipolar disorder, anti-social personality disorder (ASPD) and substance use disorder, but is less associated with offenders presenting with depression (Soderstrom, Nilsson, Sjodin, Carlstedt, & Forsman, 2005). Empirical research studies have also highlighted significant co-morbidity between psychotic disorders, such as schizophrenia, and psychopathy within forensic samples and suggest that it is unlikely that Axis I and Axis II disorders occur independently (Blackburn, Logan, Donnelly & Renwick, 2003). However the has been little research to date that has explored the role of psychopathy among mentally disordered offenders or offenders with psychological disorders and it’s associated impact on emotion processing.

Exclusion of psychological disorder in psychopathy research to date

It appears that the majority of studies investigating the role of psychopathy among offenders in relation to the processing of emotional stimuli have excluded offenders with a history of psychological disorders such as bipolar disorder, psychosis or schizophrenia (eg. Baskin-Sommers et al., 2010; Kiehl et al., 2001) and a history of any personality disorder (eg. Lake, Baskin-Sommers, Li, Curtin, & Newman, 2001; Newman et al., 2010). Sadeh & Verona (2012) claim that the presence of co-morbid diagnoses such as psychosis or bipolar disorder among offenders may exaggerate the level of psychopathy recorded. Research among offenders therefore appears to be misrepresentative of offenders given the reported elevated prevalence of personality disorders and psychological disorders among samples of offending groups (Blackburn et al., 2003). Some studies that have investigated the role of psychopathy for emotion processing among offenders have
also failed to specify whether or not participants were excluded for presented with a documented history of any psychological disorder (eg. Lorenz & Newman, 2002).

**What about the contribution of psychopathy to emotion processing among mentally disordered offenders?**

There is a wealth of research investigating the contribution of psychopathy to the processing of emotional stimuli among offenders, but has excluded offenders with psychological disorders. Added to this, research has also shown that emotion processing is impaired among individuals with co-morbid psychological disorders. It appears that it would be useful to conduct a literature review of relevant research that has included any sample of offenders with psychological disorders while controlling for the presence of psychopathy in order to evaluate knowledge to date in this area of whether the role of psychopathy or psychological disorder has more impact on emotion processing. Research that has compared offenders with psychopathy to offenders with psychological disorders would also be useful to explore.

The purpose of this literature review was therefore to determine how psychopathy is related to deficits in emotion processing both compared to offenders with psychological disorder and as a mediating factor within mentally disordered offenders.
Method

Search strategy

Relevant studies were identified for the purposes of this literature review using three databases: PsychINFO, PubMed and ScienceDirect. The key search terms that were used were ‘mentally disordered offenders’ or offen* (offenders) along with disorder* (disorders) in order to identify literature that included research using some participants who were offenders who presented with some kind of psychological disorder. Added to these terms, a variety of search words were also included: schiz* (schizophrenia etc), psychosis, psychotic, anti-social, personality, violen* (violent, violence) in order to account for any studies that referred to specific types of psychological disorders and/or violence. Also, the search terms emotion* (emotion, emotional), fear* (fear, fearlessness), threat* (threatening) along with regulat* (regulate, regulation), perception, perceive, recogni* (recognise, recognition) or process* (processing) were included in order to find studies that focused on some aspect of emotion, fear or threat perception. All searches included the addition of the search word psychopath* in order to account for various terms such as psychopath, psychopathy, psychopathic etc as the role of psychopathy was key to this current literature review (see table 1 below for clarification of search terms). All searches were conducted within the abstracts of relevant articles.
Table 1:

*Search terms used for literature review*

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<tr>
<th>AND/OR</th>
<th>Search Terms</th>
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<tr>
<td>AND</td>
<td>‘mentally disordered offenders’ OR (offen* AND disorder*)</td>
</tr>
<tr>
<td>AND</td>
<td>schiz* OR psychosis OR psychotic OR anti-social OR personality OR violen*</td>
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<tr>
<td>AND</td>
<td>(emotion* OR fear* OR threat*) AND (regulat* OR perception OR perceive OR recogni* OR process*)</td>
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<tr>
<td>AND</td>
<td>Psychopath*</td>
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**Inclusion criteria**

Studies were included in this current literature review if they met the following criteria:

1. The studies were empirical research studies.
2. Participants in the studies were criminal offenders.
3. The studies were conducted in a forensic setting.
4. The studies included offenders with psychological disorders (with or without personality disorder)
5. Participants in the studies were adults (above 18 years of age).
6. The studies controlled for or compared the role of psychopathy.
7. The studies included a standardised measure of psychopathy.
8. The studies used an experimental task of emotion, fear or threat recognition, processing, perception or regulation.
9. The studies were peer-reviewed.

The Mental Health Act (2007; MHA, 2007, c.12, p.1) included an amended definition of mental disorder to the 1983 Mental Health Act that specifies mental disorder as “any disorder or disability of the mind”. This is a legal definition of mental disorder. For the purposes of this review, the term mental disorder will be used when referring to the current legal definition of mental disorder where studies have been conducted with individuals who have been classified as mentally disordered offenders and have thus been placed in secure hospital settings. Studies that have included individuals who are offenders with either Axis I or Axis II psychological disorders will be consistently referred to as offenders with psychological disorders (with or without personality disorders).
Results

The initial search of the three databases (PsychInfo, PubMed and ScienceDirect) resulted in twenty-eight, forty-eight and twelve articles respectively (see figure 1 below for an illustration of the search process).

Of these initial resulting articles, forty articles were initially eliminated on the basis of reading their abstract as it was evident that they did not meet the inclusion criteria set. Of the remaining studies, duplications were then eliminated and a total of
twenty articles remained. Of these, twelve studies were further eliminated upon 
reading the entire study, as they did not meet the full inclusion criteria. The most 
common reason for eliminating these twelve articles was that studies did not evaluate 
the contribution of psychological disorder for emotion processing. The literature 
search resulted in a total of eight studies that met all inclusion criteria set out prior to 
the search.

**Overview of resulting studies**

The eight studies that met all inclusion criteria were conducted between 2001 and 
2012 (see Table 2 at the end of the appendices for a summary of the studies). There 
appears to be no available research in the area of emotion processing among 
mentally disordered offenders that controlled for levels of psychopathy or that 
compared emotion processing between offenders with psychological and offenders 
with high levels of psychopathy prior to 2001. Participants were mostly male, with 
the exception of the Anton, Baskin-Sommers, Vitale, Curtin, & Newman (2012) 
study who used a sample of females only. All other seven studies were based on 
outcomes from male participants only. As per the inclusion criteria, all eight studies 
employed an experimental research design that included some form of task 
measuring emotion and/or threat perception, processing or recognition.

**Participant recruitment & type of forensic settings**

Dollan & Fullam (2005, 2006) and Domes, Mense, Vohs, & Habermeyer (2012) 
recruited participants from a mixture of high-security prison and a maximum-
offenders from a prison only while Fullam & Dolan (2006) recruited from medium-
and maximum-security hospitals only. Verona, Sprague, & Sadeh (2012) document recruiting participants from a mixture of forensic settings including probation services and prisons, whereas Herpertz et al. (2001, p.738) described recruiting from ‘high-security forensic treatment facilities’ and may possibly be assumed to be a hospital setting as opposed to a prison. Anton et al. (2012) recruited a sample of female offenders from a minimum-security prison.

**Diagnostic criteria for psychological disorder or personality disorder**

Studies used a range of diagnostic criteria and diagnostic tools to determine participant samples of offenders with co-morbid psychological disorder or personality disorder. Dolan & Fullam (2005), Domes et al. (2012) used the SCID-II for anti-social personality disorder (ASPD) whereas Anton et al. (2012), Kosson et al. (2006) and Verona et al. (2012) used interview questions relating to DSM-IV criteria for the assessment of ASPD among participants. Herpertz et al. (2001) used the International Personality Disorder Examination (IPDE; Loranger et al., 1999) for diagnosing borderline personality disorder (BPD). Dolan & Fullam (2005), Domes et al. (2012), Fullam & Dolan (2006) & Verona et al. (2012) used SCID-I to screen for Axis I disorders (Verona only to screen for depression & substance use disorder). Fullam & Dolan (2006) used the Positive & Negative Syndrome Scale (PANSS, Kay et al., 1987) to determine severity of symptoms of schizophrenia among participants.

**Assessment of psychopathy**

The Psychopathy Checklist: Revised (PCL:R; Hare, 2003) is the most widely used measure of psychopathy for research and clinical purposes (Hare & Neumann, 2008). The PCL:R is a 20-item standardised clinical rating scale measure of
psychopathy that relies on semi-structured interview and case history information (Hare, 2003). The PCL:R comprises two factors of psychopathy: interpersonal/affective dimension (Factor 1) and impulsive/anti-social dimension (Factor 2) (Hare, 2003). The Psychopathy Checklist: Screening version (PCL:SV; Hart, Cox & Hare, 1995) is a 12-item standardised scale that measures psychopathic traits (Hart et al., 1995). It is reported to be reliable substitute for the PCL:R and represents the same two-factor structure as the PCL:R (Hart et al., 1995). All eight studies found for this literature review used either the Psychopathy Checklist: Revised (PCL:R; Hare, 2003) or the Psychopathy Checklist: Screening version (PCL:SV; Hart et al., 1995) to assess the severity of psychopathic traits among participants. The PCL: R was used in Anton et al. (2012), Domes et al. (2012) and Kosson et al. (2006) while the PCL:SV was used in the remaining five studies.

Aspects of emotion perception investigated

The studies that formed this literature review investigated a range of aspects of emotion processing. For example, Anton et al. (2012) administered an instructed fear-conditioning task and measured participants’ startle reflex response to threat stimuli. Dolan & Fullam (2005) assessed participants’ emotional memory using a task that involved free and cued recall of emotional and neutral information. Recognition of facial affect was investigated by both Dolan & Fullam (2006) & Fullam & Dolan (2006) using a facial recognition task. Domes et al. (2012) administered an emotional stroop task, an amended version of the traditional stroop task, to evaluate attentional bias to negative stimuli. Emotional arousal to affective pictures was measured using physiological measurements such as skin conductance response (SCR), EMG and eye-blink startle reflex by Herpertz et al. (2001). Finally,
both Kosson et al. (2006) & Verona et al. (2012) used an emotional word recognition task involving additional inhibitory control to assess the contribution of cognitive processes when processing emotional stimuli.

**Methodology for evaluating the contribution of psychopathy and psychological disorder in emotion processing**

The studies found for this literature review differed widely in terms of how the contribution of psychopathy and psychological disorder was investigated among offenders. Studies that controlled for level of psychopathy among mentally disordered offenders focused primarily on samples of individuals with personality disorders. For example, some studies evaluated levels of anti-social personality disorder (ASPD) and psychopathy among a generic sample of offenders (eg. Anton et al., 2012). Other studies controlled for levels of psychopathy among a mixture of offenders who met clinical criteria for ASPD and offenders who did not have ASPD (eg. Domes et al., 2012). Studies compared offenders with a clinical diagnosis of psychopathy to offenders with a clinical diagnosis of borderline personality disorder (BPD) (without psychopathy) (eg. Herpertz et al., 2001) or ASPD (eg. Verona et al., 2012) while another compared a sample of offenders with both psychopathy and ASPD to both offenders with ASPD alone and to control offenders (Kosson et al., 2006). Further studies used a full sample of personality disordered offenders (ASPD) and evaluated the contribution of level of psychopathy to emotion processing (eg. Dolan & Fullam, 2005, Dolan & Fullam, 2006). Only one study was found that evaluated the role of psychopathy among a sample of mentally disordered offenders who all had a clinical diagnosis of schizophrenia (Fullam & Dolan, 2006).
**Face affect recognition tasks**

Previous research has largely supported the hypothesis that individuals with high levels of psychopathy show deficits in facial affect recognition, particularly in relation to sad and fearful expressions (see Dawel et al., 2012 for meta-analysis). Two studies evaluated emotion processing using facial affect recognition tasks (Dolan & Fullam, 2006; Fullam & Dolan, 2006).

Dolan & Fullam (2006) controlled for the contribution of level of psychopathy (psychopathy vs non-psychopathy) in a sample of offenders with ASPD compared to controls. This study predicted that among this sample of ASPD offenders, the role of psychopathy would remain significant for deficits in facial recognition of sad and fearful expression. Significant differences were found between ASPD offenders and controls for all aspects of facial affect recognition. The study found a significant difference between ASPD offenders with psychopathy compared to ASPD offenders without psychopathy for sad facial expressions only (Dolan & Fullam, 2006). However within this sample of ASPD offenders, the majority met criteria for high levels of psychopathy as only seven participants had a score below 13 on the PCL:SV. This may have meant that comparisons with low psychopathy offenders were not meaningful in terms of actual differences in levels of psychopathy between the groups.

Fullam & Dolan (2006) administered the same facial affect recognition task (AFFECT; Gagliardi et al., 2003) with a sample of violent offenders who all had a primary clinical diagnosis of schizophrenia. The sample was divided in low-, medium- and high-psychopathy groups based on their PCL:SV scores. The study reported significant differences between the high psychopathy group and low
psychopathy group for sad face recognition only. No other significant differences were found between the groups (Fullam & Dolan, 2006). The study does not specify how many participants out of a total sample of forty-nine comprised the low, medium- and high-psychopathy groups giving rise to speculation that comparison groups may have been too small to detect actual differences in facial recognition.

**Emotional memory tasks**

Less research has been conducted in the area of memory for emotional stimuli (Dolan & Fullam, 2005). However, based on previous research Dolan & Fullam hypothesised that ASPD offenders would show impairments in emotional memory compared to controls but were exploring the contribution of level of psychopathy in this sample. Dolan & Fullam (2005) administered an emotional memory task to a group of ASPD violent offenders who were further sub-divided into low-, medium- and high-psychopathy based on the PCL:SV, and a group of healthy non-offending controls (n=20) across two phases, free and cued recall of a story containing emotional information. The high-psychopathy ASPD offender group were the only group who did not show significant improvement for memory of emotional stimuli across the two phases of the task and suggests that the role of high psychopathy symptoms is related to emotional memory formation deficits (Dolan & Fullam, 2005). The high psychopathy group were also significantly impaired during the free recall stage of the task which suggests, according to the authors, that individuals with high psychopathy show impairment when initially processing emotional stimuli as they may not be aroused by such stimuli (Dolan & Fullam, 2005). The authors also note that using this sample of violent offenders meant that showing pictures of injury and may have caused less arousal in this group overall (Dolan & Fullam, 2005).
Emotional words tasks

Individuals with high levels of psychopathy are hypothesised to exhibit slower processing of affective words compared to controls who have been shown to process affective words faster than neutral words – a process known as affective facilitation (Domes et al., 2012). Domes et al. (2012) used an emotional stroop task for the purposes of measuring emotion processing in a sample of sixty-nine offenders with and without clinical criteria for ASPD from both a prison and forensic-psychiatric hospital. The study compared the two groups of offenders to twenty-four non-offender controls. Offenders were then split into low-, medium-, and high-psychopathy. When assessing the contribution of level of psychopathy for emotional processing of affective words, the only significant difference found was when offenders with high psychopathy, compared to controls, were reported to exhibit significantly magnified attentional bias for negative affective words in the congruent trial condition of the task, which is in contrast to the study’s hypothesis (Domes et al., 2012).

A similar lexicon-decision task was used by Kosson et al. (2006) in a sample of eighty-eight offenders. In line with their hypothesis, Kosson et al. (2006) reported that offenders with ASPD and co-morbid clinically elevated levels of psychopathy exhibited significant impairment when processing affective words and showed impaired (slower) affective facilitation compared to both ASPD-alone offenders and control offenders (no ASPD or psychopathy).

Physiological measures of arousal

Herpertz et al. (2002) compared the performance of psychopathic offenders, borderline personality disorder (BPD) offenders and healthy non-offender controls
on an emotion processing of affective photographs task. Participants were compared on a measure of skin conductance response (SCR) to measure their level of arousal, facial electrodes as a measure of frown response and electrodes to measure the blink startle reflex while viewing the photographs. The study predicted that offenders with clinically elevated psychopathy would exhibit diminished startle response when viewing the affective pictures along with lower levels of arousal (SCR) compared to healthy non-offender controls.

Although the study found no main effect of group for startle reflex, one-third of psychopaths exhibited no startle reflex at all (Herpertz et al., 2002). This finding adds evidence to the theoretical position that individuals with high psychopathy traits possess an inherent underlying fearlessness at a physiological level compared to controls (Herpertz et al., 2002). Added to this, psychopaths exhibited significantly less electrodermal responses to emotional pictures compared to both BPD offenders and controls. The theoretical implication of this finding is that it possibly illustrates the intrinsic reduced fear experienced by individuals with psychopathy that may lead to increased violent and anti-social behaviour (Herpertz et al., 2002).

One study evaluated the contribution of varying level of cognitive demand while performing an emotional processing task. Verona et al. (2011) used event-related potentials (ERPs) to assess both processing of emotional words and response inhibition on an emotionally-linguistic go/no-go task in a sample of ASPD, psychopathic and control offenders. When analysed using the two factors of the PCL:SV, the relationship between Factor 1 (interpersonal/affective) and processing of negative emotional stimuli was almost significantly correlated ($p<.08$). The study found that the psychopathic group showed deficits in negative emotional processing
in both the ‘go’ and ‘no-go’ aspects of the task and suggests that individuals with psychopathy did not differentiate between neutral and negative word types across trials in the go/no-go task. According to the authors, this finding further adds to evidence that psychopathy is linked with neural deficits as no differences were found across trials that differed in terms of cognitive demands (Verona et al., 2011). The study also reported that offenders with psychopathy displayed reduced neural processing of negative emotion as measured by ERP (Verona et al., 2011).

Anton et al. (2012) used fear-potentiated startle (FPS) as a physiological measure of emotion arousal in a sample of female offenders. Participants were assessed for level of DSM-IV symptoms of anti-social personality disorder (ASPD) and psychopathy. Participants took part an instructed fear-conditioning task that involved three conditions: threat-focused condition, alternative focus (low load) condition, and alternative focus (high load) condition in which a shock was administered at varying times dependent on condition. The study found no significant main effect of psychopathy across the conditions (Anton et al., 2012). Even after controlling for symptoms of ASPD, there was no significant relationship between level of psychopathy and fear-potentiated startle (FPS) response (Anton et al., 2012).
Discussion

Overview of literature review

The aim of this literature review was to explore the available research that has been conducted in the area of emotion processing in offenders with psychopathy and psychological disorder to date. More specifically, this literature review compiled the available empirical research studies that have evaluated the contribution of psychopathy while investigating emotion processing among mentally disordered offenders. Empirical research that compared offenders with high levels of psychopathy to offenders with psychological disorder or personality disorder was also examined. Essentially, it appears that research in this area, particularly in the area of controlling for the impact of psychopathy on emotion processing among mentally disordered offenders, is lacking. The majority of studies considered either compared or controlled for psychopathy among offenders with personality disorders, whereas only one study (Fullam and Dolan, 2006) evaluated the contribution of level of psychopathy among a sample of offenders with schizophrenia.

Mixed findings for role of psychopathy and psychological disorder in emotion processing

The literature review found mixed findings for emotion processing among the samples of interest. For the processing of emotional words, Kosson et al. (2006) reported findings in line with both previous research and their hypothesis and showed that offenders with a combination of personality disorder (ASPD) and psychopathy exhibited significant impairment when processing affective words and showed impaired (slower) affective facilitation compared to both offenders with
ASPD-alone and control offenders (no ASPD or psychopathy). In contrast, Domes et al. (2012) reported that high psychopathy offenders (with and without comorbid ASPD) showed significantly attenuated attentional bias for emotional words compared to non-offenders. For facial affect recognition deficits, both Dolan & Fullam (2006) and Fullam & Dolan (2006) reported a significant contribution of psychopathy for sad facial expression only in both a sample of offenders with/without ASPD and sample of offenders with schizophrenia. In relation to emotional memory, Dolan & Fullam (2005) suggests that high psychopathy symptoms are related to emotional memory formation deficits among offenders with personality disorder (ASPD).

For physiological arousal in relation to emotional stimuli, Herpertz reported that although the study found no main effect of group for startle reflex, one-third of psychopaths exhibited no startle reflex at all and that psychopaths exhibited significantly less physiological arousal (SCR) to emotional pictures compared to both BPD offenders and controls, similar to findings by Verona et al. (2004) for offenders with psychopathy without co-morbid personality disorder. Verona et al. (2011) reported that offenders with psychopathy displayed reduced neural processing of negative emotion as measured by ERP. However Anton et al. (2012) found no main effect of level of psychopathy for fear-potentiated startle across threat and no threat conditions.

**Researching emotion processing among mentally disordered offenders**

Previously, research has largely avoided including offenders with a history of psychosis or other psychological disorders such as bipolar disorder as it has been suggested that scores on measures of psychopathy may be potentially inflated by the
impact of symptoms relating to these disorders (Sadeh & Verona, 2012). However, Fullam & Dolan (2006) is the first study to this researcher’s knowledge that included a full sample of offenders with schizophrenia while evaluating the contribution of psychopathy to emotion processing. It appears plausible to assume that any potential impact of the presence of schizophrenia on psychopathy scores is proportional, and subsequently controlled for across the sample of offenders with schizophrenia.

**The contribution of history of maltreatment to emotion processing deficits**

It is possible that some of the findings in the studies reviewed may not have accounted for history of maltreatment among participants. Research suggests that it is possible that early negative childhood experiences may be a contributing factor to differences in emotion processing in adulthood but the majority of studies in this literature review have not documented controlling for history of maltreatment among offenders. For instance, a meta-analysis conducted that explored the relationship between performance on the emotional stroop task and symptoms of posttraumatic stress disorder (PTSD) suggests that it is the experience of the traumatic event itself and not the subsequent development of PTSD that contributes biased processing of violent stimuli (Cisler et al., 2011). Domes et al. (2012) reported significant differences between offenders with a reported history of maltreatment that included abuse or neglect compared to non-maltreated offenders on the emotional Stroop task (EST). This highlights the importance of controlling for this information when evaluating offenders in terms of emotion processing (Domes et al., 2012). It is therefore worth suggesting that future research in this area of offenders with a high prevalence of history of maltreatment should account for and control for the potential impact of this history on emotion processing.
Exclusion and inclusion criteria for psychological disorder

Some of the studies reviewed specifically excluded a history of psychosis or bipolar disorder among their samples of offenders with personality disorders and/or psychopathy (e.g. Anton et al., 2012; Domes et al., 2012), while Herpertz et al. (2001) only excluded a history of schizophrenia. Dolan & Fullam (2005 & 2006) explain that Axis I disorders ‘were screened for’ in their samples of ASPD offenders but do not specify whether the presence of a comorbid Axis I disorder counted as an exclusion criteria. Similarly, these studies only specified that individuals who are currently taking psychotropic medication were excluded from taking part but do not elaborate or specify if there were particular disorders such as psychosis or bipolar disorder that counted as exclusion criteria. Added to this, Kosson et al. (2006) did not specify if participants were screened for psychosis or borderline personality disorder while Verona et al. (2011, p.500) specified that offenders with ‘current symptoms of psychotic, bipolar or pervasive developmental disorders’ were excluded from the study but they did not explain whether a history of either disorder resulted in exclusion from the study.

It has been well documented that high rates of Axis I and Axis II disorders are prevalent among violent offenders and as described in the introduction section of this literature review, empirical research studies have also highlighted significant co-morbidity between psychotic disorders, such as schizophrenia, and psychopathy within forensic samples and suggest that it is unlikely that Axis I and Axis II disorders occur independently (Blackburn et al., 2003). It is therefore questionable why research has excluded such a substantial proportion of offenders. Future research should include larger representative samples offenders with a range of
psychological and personality disorder in order to account for their relative contribution and to determine whether the role of psychopathy traits or the presence of psychological disorder plays a larger role in emotion processing deficits reported among these groups.

**Psychopathy, emotion regulation & attentional processes**

It has been suggested that attention processing deficits contribute to the reported emotion processing deficits among individuals with high levels of psychopathic traits. Glass & Newman (2009) posit that the reported emotion processing deficiency in psychopathy, according to the response modulation hypothesis (RMH) model of psychopathy, is not unconditional and suggest that this deficit may be impacted by attentional processes. Specifically, their research study suggested that for offenders with psychopathy compared to non-psychopathic offenders, the processing of emotional stimuli is affected by the contextual attentional demands that relate to the emotional stimuli. Furthermore, offenders with psychopathy show deficits in forming associations between the stimulus and the context, and in effect this prevents an appropriate appraisal of the emotional stimulus (Glass & Newman, 2009). Additional research in the area has also highlighted the importance of co-occurring attention processing deficits among offenders with psychopathy in relation to reported emotion processing deficits (Baskin-Sommers et al., 2012; Newman et al, 2010). The studies reviewed in this literature review were limited in terms of accounting for the additional cognitive demands placed on participants during tasks of emotion processing. It is therefore advisable that future research in the area should account for this potential contribution of attentional processes among mentally disordered offenders while also controlling for level of psychopathy.
Comparing psychopathy with psychological disorder versus controlling for psychopathy among mentally disordered offenders

This literature review highlighted two distinct methods of evaluating the contribution of psychopathy to emotion processing in the context of psychological disorder and offending behaviour. It is difficult to compare the findings from these two different methodologies. In particular, as mentioned previously, only one study was identified that evaluated the contribution of psychopathy among offenders with co-morbid schizophrenia while the remaining studies focused on co-morbid personality disorder. It is therefore problematic to compare the findings of this solitary study to studies that used samples of offenders with personality disorders (mainly anti-social personality disorder). This finding highlights the need to further research in the area of offenders with psychological disorders in addition to the more commonly researched personality disorders.

Assessment of psychopathy

It was noted that two studies (Dolan & Fullam, 2006; Herpertz et al., 2001) only used a review of participants case file in order to assess participants’ level of psychopathy traits. Added to this, both studies only used the screening version of the Psychopathy Checklist (PCL:SV; Hart et al., 1995). Although the authors of the PCL:SV maintain that this method produces a reliable evaluation of level of psychopathic traits (Hart et al., 1995), they also recommend that scores should be based on a combination of semi-structured interview and review of case files. The remaining studies reviewed for the purposes of this literature did use the combination of methods described. However it must also be acknowledged that only three of the studies reviewed used the PCL:R as opposed to the PCL:SV. Again, although the
authors of the tests insist that the screening version can be used instead of the full version, correlations across the two factor structures are only .67 for Factor 1 and .68 for Factor 2 (Hart et al., 1995). For the purposes of future research, the full PCL:R which is based on a combination of semi-structured interview and review of case file should be implemented in order to make appropriate inferences regarding participants’ level of psychopathic traits.

Implication of source of participants

The studies in this literature review documented a range of settings from which participants with psychological and personality disorders were recruited. This may have impacted the range and severity of psychological disorder present among individuals across these settings. For example, some studies recruited from a mixture of high-security prisons and maximum-security hospitals (eg. Dollan & Fullam, 2005; 2006) or from hospital only (Domes et al., 2012; Fullam & Dolan, 2006; Herpertz et al., 2001) or prison only (eg. Kosson et al., 2006). Other studies recruited from a mixture of forensic services (Verona et al., 2012), or a minimum-security correctional centre (eg. Anton et al., 2012). Offenders detained in high security hospitals would be assumed under the mental health act (MHA, 2007) to have a higher nature and degree of severity of psychological disorder compared to offenders in low or minimum-secure facilities.

Added to this, some studies used mixed samples of offenders with and without psychological disorder when controlling for psychopathy. For example, Domes et al. (2012) evaluated level of psychopathy and compared offending groups for emotion processing but did not account for high psychopathy +/- ASPD and what impact having or not having a comorbid personality disorder had when processing negative
emotional stimuli in relation to psychopathy. This additional factor must be considered when evaluating and comparing findings such as Anton et al. (2012) and Domes et al. (2012) who report no or little relevance of psychopathy after controlling for symptoms of ASPD.

Given the difficulty in assigning offenders to appropriate groups based on clinical diagnoses of co-morbid psychological disorders Wahlund & Kristiansson, (2009) have put forward a suggestion that research in the area of violent offenders with and without comorbid psychological disorders could focus less on DSM-IV diagnoses and more on the specific deficit presented, for example, lack of empathy or lack of impulse control etc. when comparing performance on tasks.

**Aspects of emotion processing not investigated within this literature review**

Most aspects of emotion processing, although limited in the number of studies per aspect, have been covered across the studies described in this literature review. However, none of the studies explored in this literature review evaluated audio emotion processing, a deficit that has been previously shown to be significant between offenders with and without psychopathy (Bagley et al., 2009; Verona et al., 2004).

**Sample sizes for assessing contribution of psychopathy**

Some of the studies discussed in this literature review have not specified how many participants have been compared on level of psychopathy or have small sample sizes. For example, Domes et al. (2012) did not clarify how many participants were used for the low-, medium-, and high-psychopathy groups for comparison of affective word processing. Added to this, Herpertz et al. (2002) used small sample
sizes (groups ranged from n=18 to n=25) but these were comparable with other studies investigating psychophysiological arousal levels.

**Implications of the findings of this literature review**

As described above, the findings of this literature review need to be viewed with caution. Some studies reported a significant contribution of psychopathy while controlling for psychological or personality disorder for the processing of emotional stimuli (Dolan & Fullam, 2006; Fullam & Dolan, 2006). Other studies also showed a significant effect of high levels of psychopathy, independent of personality disorder, for memory of emotional stimuli (Dolan & Fullam, 2005) or processing of emotional words (Kosson et al., 2006). However significant findings were often limited to specific conditions (eg. sad facial recognition only or depending on focus of attention). Studies that did not report any significant contribution of psychopathy have been questioned in relation to the appropriateness of samples used (eg. Anton et al., 2012). Nonetheless, this literature review highlights an important gap in the literature in the area of psychopathy among offenders with psychological disorders. Specifically, it draws attention to the lack of research in the area of mental disorder and the role of level of psychopathy on potential emotion processing deficits. This review therefore raises the following research questions:

**Research questions:**

1. Are the possible differences in facial emotion processing between mentally disordered offenders (including offenders with and without psychopathy, personality disorder and psychological disorder) and controls influenced by level of psychopathy?
2. Are the potential differences in aspects of emotion processing (e.g., affective word recognition, auditory emotional processing, processing of emotional memory) between mentally disordered offenders and controls mediated by level of psychopathy?

3. Are the hypothesised differences in psychophysiological arousal (such as skin conductance response) to emotion stimuli between mentally disordered offenders and controls impacted by level of psychopathy?

4. How does a history of maltreatment contribute to potential emotion processing deficits among mentally disordered offenders while controlling for levels of psychopathy?
References


Summary of Clinical Training

Placement 1: Adult Mental Health (1 Year)

My first year clinical placement was working at Adult Mental Health Recovery & Support Team (Secondary Care). Brief description of duties and responsibilities: Provided individual psychological therapy to adults experiencing mental health difficulties (psychosis, bipolar disorder, generalised anxiety disorder, depression, anxiety) using a predominantly CBT approach. Administering neuropsychological assessments for adults suspected of learning difficulties. Lead psychoeducation groups for anxiety and insomnia on affiliated inpatient ward in Springfield hospital. Conducted extended assessment and formulations for complex mental health difficulties. Liaised with other members of multi-disciplinary team.

Placement 2: Older Adults (6 Months)

My second clinical placement was working at an Older People's Service that was split between a Community Mental Health Team, Challenging Behaviour Service & Memory Clinic. Brief description of duties and responsibilities: Consultation with care staff in residential and nursing homes for referrals of behaviour that challenged. Conducted behaviour analysis of challenging behaviour and applied psycho-social interventions for challenging behaviour. Lead staff training sessions for managing challenging behaviour associated with middle to late stage dementia (eg. Validation training, Challenging behaviour training). Supervision of assistant clinical psychologist as part of this work. Administered complex neuropsychological assessments for older adults presenting with symptoms of dementia. Provided individual psychological therapy to older adults experiencing mental health difficulties (depression, anxiety) using a predominantly CBT approach.
Placement 3: Child & Adolescent Mental Health (6 Months)

My third clinical placement was at a Tier Three Child & Adolescent Mental Health Service (CAMHS). Brief description of duties and responsibilities: Provided individual psychological therapy to children and adolescents experiencing mental health difficulties (low mood, anxiety, self-harm, suicidal ideation, anger, OCD) using a range of psychological models (CBT, systemic family therapy, motivational interviewing). Worked systemically with children and their families for behaviours presenting as challenging (eg. aggression). Lead facilitator of a CBT group for young people with low mood. Conducted extended ASD assessments with other professionals. Conducted neuropsychological assessments with adolescents presenting with learning difficulties.

Placement 4: Learning Disabilities (6 Months)

My fourth placement was at Mental Health Learning Disabilities Team. Brief description of duties and responsibilities: Provided individual psychological therapy to adults with learning disabilities who also experienced mental health problems (depression, anger, anxiety, psychosis) using a range of psychological models (CBT, narrative, systemic family therapy, motivational interviewing). Consulted with care staff for referrals for behaviour that was found to be challenging using a biopsychosocial framework. Conducted complex neuropsychological assessments for a range of learning disabilities using standardised tests and measures. Administered extended assessments for Autistic Spectrum Disorder. Provided consultation for the development of a local adult ADHD service.
Placement 5: Specialist placement in Stroke/Neuro-Rehab (6 Months)

My final placement was split between an acute inpatient Stroke Ward and a specialist Neuro-Rehabilitation Centre. Brief description of duties and responsibilities:

Assessment and management of mood among patient in acute in-patient ward post stroke. Conducting cognitive assessments with adults after acquired/traumatic brain injury and developing neuro-rehab plans and carrying out appropriate interventions. Joint working with other professionals such as physiotherapists, occupational therapists and speech and language therapists in order to break down barriers to engaging in rehabilitation. One-to-one psychological therapy with adults with acquired brain injury using a range of models and interventions (eg. CBT, motivational interviewing). Providing consultation with wider MDT. Leading therapy groups (eg, Memory rehabilitation, adjustment).
## Summary of academic assignments

### Year I Assessments

<table>
<thead>
<tr>
<th>Programme Component</th>
<th>Title of Assignment</th>
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<tbody>
<tr>
<td>Fundamentals of Theory and Practice in Clinical Psychology (FTPCP)</td>
<td>Short report of WAIS-III data and practice administration.</td>
</tr>
<tr>
<td>Practice case report</td>
<td>Cognitive behavioural assessment, initial formulation and action plan for an adult male presenting with severe generalized anxiety</td>
</tr>
<tr>
<td>Problem Based Learning – Reflective Account 1</td>
<td>A reflective account of the ‘relationship to change’ problem based learning task.</td>
</tr>
<tr>
<td>Research – Literature Review</td>
<td>The contribution of psychopathy to emotion processing in mentally disordered offenders – A review of the literature</td>
</tr>
<tr>
<td>Adult – Case Report 1</td>
<td>Cognitive behavioural therapy with an adult female presenting with symptoms of bipolar disorder</td>
</tr>
<tr>
<td>Adult – Case Report 2</td>
<td>Cognitive behavioural therapy with an adult male presenting with symptoms of psychosis, an alternative approach focusing on worry</td>
</tr>
<tr>
<td>Research – Qualitative Research Project</td>
<td>Experiences of Romantic Relationship Formation Using Computer-Mediated Communication: A Thematic Analysis</td>
</tr>
<tr>
<td>Research – Major Research Project Proposal</td>
<td>Characterising Emotion Processing, Fear and Anxiety in Mentally Disordered Offenders</td>
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### Year II Assessments

<table>
<thead>
<tr>
<th>Programme Component</th>
<th>Title of Assessment</th>
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<tbody>
<tr>
<td>Research - SRRP</td>
<td>Evaluating a validation and communication training workshop for staff working with older adults with dementia in nursing and care homes</td>
</tr>
<tr>
<td>Research</td>
<td>Research Methods and Statistics test</td>
</tr>
<tr>
<td>Professional Issues Essay</td>
<td>Critically discuss and evaluate the use of psychological therapies for adults with learning disabilities</td>
</tr>
<tr>
<td>Problem Based Learning – Reflective Account 2</td>
<td>A reflective account of the problem based learning task related to the Stride family.</td>
</tr>
<tr>
<td>Older Adults – Case Report 3</td>
<td>A neuropsychological assessment with an older lady presenting with wording finding difficulties, memory problems and anxiety</td>
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<tr>
<td>Personal and Professional Learning Discussion Groups – Process Account</td>
<td>A process account of the Personal and Professional Learning Discussion Group (PPLDG)</td>
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### Year III Assessments

<table>
<thead>
<tr>
<th>Programme Component</th>
<th>Assessment Title</th>
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<tbody>
<tr>
<td>Research – MRP Portfolio</td>
<td>Characterising emotion processing, fear and anxiety in mentally disordered offenders</td>
</tr>
<tr>
<td>Personal and Professional Learning – Final Reflective Account</td>
<td>On becoming a clinical psychologist: A retrospective, developmental, reflective account of the experience of training.</td>
</tr>
<tr>
<td>People with Learning Disabilities – Case Report 5</td>
<td>Narrative therapy with a young woman with mild learning disability for the treatment of long-standing anxiety</td>
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