

Attentional Bias Towards Positive and Negative Imagery  
Amongst Offenders and Non-Offenders with Intellectual Disabilities

Susan Amira Sadek

University of East Anglia

Submitted in partial fulfilment of the  
Doctorate in Clinical Psychology (ClinPsyD)

1<sup>st</sup> May 2014

This copy of the thesis has been supplied on condition that anyone who consults it is understood to recognise that its copyright rests with the author and that use of any information derived there from must be in accordance with current UK Copyright Law. In addition, any quotation or extract must include full attribution.

## Table of Contents

Abstract.....	11
1 Introduction.....	12
1.1 Chapter Overview .....	12
1.2 Intellectual Disabilities and Offending .....	12
1.2.1 Section Overview .....	12
1.2.2 Intellectual Disabilities.....	13
1.2.2.1 Historical and Recent Context .....	13
1.2.2.2 Population Characteristics.....	16
1.2.3 Intellectual Disabilities and Offending .....	17
1.2.3.1 Population Characteristics.....	19
1.2.3.2 Interventions.....	21
1.2.4 Section Summary .....	23
1.3 Theories and Models of Offending .....	23
1.3.1 Section Overview .....	23
1.3.2 Theoretical Explanations.....	24
1.3.2.1 Moral Reasoning .....	24
1.3.2.1.1 Moral Reasoning and Offending .....	25
1.3.2.2 Empathy .....	27
1.3.2.2.1 Empathy and Offending .....	30
1.3.2.3 Social Information Processing .....	33
1.3.2.3.1 Social Information Processing and Offending .....	37
1.3.2.4 Summary .....	38

1.3.3	Models of Offending .....	38
1.3.3.1	Palmer’s Model .....	38
1.3.3.2	Aresenio and Lemerise’s Model .....	41
1.3.3.3	Garrigan and Langdon’s Model .....	42
1.3.3.3.1	Application to IDO .....	46
1.3.4	Section Summary .....	47
1.4	Attentional Bias .....	48
1.4.1	Section Overview .....	48
1.4.2	Attentional Bias .....	48
1.4.2.1	Assessment .....	50
1.4.3	Attentional Bias and Empathy .....	53
1.4.4	Attentional Bias and Offending .....	55
1.4.4.1	Literature Review .....	56
1.4.4.1.1	Attentional Bias: Faster .....	57
1.4.4.1.2	Attentional Bias: Slower .....	57
1.4.4.1.3	Attentional Bias: No Observed Differences .....	64
1.4.4.1.4	Summary of Findings and Methodological Considerations .....	64
1.4.4.2	Attentional Bias in ID and IDO .....	66
1.4.5	Section Summary .....	67
1.5	Chapter Summary .....	67
1.6	Rationale and Hypotheses .....	68
1.6.1	Rationale and Outline of the Investigation .....	68
1.6.2	Research Questions and Hypotheses .....	69
2	Methods .....	71

2.1	Chapter Overview .....	71
2.2	Design .....	71
2.1	Participants.....	71
2.1.1	Power Calculations.....	71
2.1.2	Sample.....	73
2.1.2.1	Attrition.....	73
2.1.2.2	Final Sample .....	74
2.1.3	Inclusion Criteria.....	74
2.1.4	Exclusion Criteria.....	75
2.1.5	Recruitment Strategy.....	75
2.2	Materials.....	76
2.2.1	Demographic Data .....	76
2.2.2	General Intellectual Functioning.....	76
2.2.3	Empathy Quotient .....	77
2.2.4	Affective Pictures Dot-Probe Task .....	78
2.2.4.1	Stimuli.....	79
2.2.4.2	Trials .....	81
2.2.4.3	Practice Procedure.....	83
2.2.4.4	Main Task Procedure .....	86
2.2.4.5	Counterbalancing and Randomisation .....	86
2.2.4.6	Software and Hardware.....	86
2.2.5	Anxiety and Depression Questionnaires .....	87
2.2.5.1	Glasgow Anxiety Scale.....	88
2.2.5.2	Glasgow Depression Scale.....	88

2.3	Procedure.....	89
2.4	Ethical Considerations .....	90
2.4.1	Ethical Approval .....	90
2.4.2	Decision Making.....	91
2.4.2.1	Reducing Coercion.....	91
2.4.2.2	Ensuring Capacity .....	91
2.4.2.3	Taking Informed Consent .....	92
2.4.3	Confidentiality .....	92
2.4.4	Distress.....	93
2.4.5	Debriefing .....	94
2.4.6	Researcher Safety.....	94
2.4.7	Participant Reimbursement .....	94
2.5	Data Preparation.....	94
2.5.1	Data Analysis .....	94
2.5.2	Errors and Outliers .....	95
2.5.3	Preparation for Analyses.....	96
2.5.3.1	Vigilance and Disengagement (Hypothesis 2a and 2b) .....	96
2.5.3.2	Attentional Bias Index (Hypothesis 3a and 3b) .....	97
2.6	Chapter Summary.....	99
3	Results.....	100
3.1	Chapter Overview .....	100
3.2	Preliminary Data and Analyses.....	100
3.2.1	Attrition.....	100
3.2.2	Sample.....	100

3.2.3	Descriptive Data.....	101
3.2.4	Preliminary Analyses .....	105
3.3	Main Analyses.....	107
3.3.1	Research Question 1.....	107
3.3.2	Research Question 2.....	107
3.3.3	Research Question 3.....	110
3.3.4	Research Question 4.....	111
3.3.5	Chapter Summary.....	112
4	Discussion.....	117
4.1	Chapter Overview .....	117
4.2	Discussion of Findings .....	117
4.2.1	Empathy .....	117
4.2.2	Attentional Bias.....	118
4.2.3	Attentional Bias and Empathy .....	124
4.2.4	Section Summary .....	125
4.3	Methodological Considerations .....	125
4.3.1	Ethical Considerations .....	125
4.3.2	Sample.....	126
4.3.2.1	Generalisability .....	126
4.3.2.2	Participation Criteria .....	127
4.3.2.3	Equivalence Between Groups .....	127
4.3.2.4	Treatment .....	130
4.3.2.5	Sample Size.....	131
4.3.3	Processes and Procedures.....	132

4.3.3.1	Blinding.....	132
4.3.3.2	Support .....	132
4.3.3.3	Contextual Factors .....	132
4.3.3.4	Assessment Order.....	133
4.3.4	Measures .....	133
4.3.4.1	IQ Assessment.....	133
4.3.4.2	Demographic and Offence Information .....	134
4.3.4.3	Empathy .....	135
4.3.4.4	Dot-Probe Task .....	135
4.3.4.5	Analyses .....	137
4.3.5	Section Summary .....	138
4.4	Theoretical Implications.....	139
4.5	Clinical Implications .....	141
4.6	Future Research.....	143
4.7	Chapter Summary and Conclusions .....	145
5	References.....	147
6	Appendices .....	171

**List of Figures**

Figure 1. Crick and Dodge’s (1994) Social Information Processing Model.....35

Figure 2. Palmer’s Developmental Model of Offending .....40

Figure 3. Garrigan and Langdon’s (In Press) Developmental Model of Offending. ....43

Figure 4. Representation of a Trial on the Dot-Probe Task. ....82

Figure 5. Practice Information for the Dot-Probe Task: Part 1.....84

Figure 6. Practice Trials for the Dot-Probe Task: Part 2.....85

Figure 7. Attentional Bias Index Calculations .....98



## List of Tables

Table 1. Classification Systems Describing Intellectual Disabilities.....	15
Table 2. Key Developments in Moral Reasoning Theories .....	26
Table 3. Hoffman's Developmental Model of Empathy .....	29
Table 4. Crick and Dodge's (1994) Social Information Processing Model.....	34
Table 5. Palmer's Developmental Model of Offending.....	39
Table 6. Garrigan and Langdon's (In Press) Developmental Model of Offending .....	44
Table 7. Systematic Literature Review of Attentional Bias Studies in Offenders.....	58
Table 8. Recruitment and Support Data, by Group.....	101
Table 9. Offence Details in the IDO Group .....	102
Table 10. Demographic Data, by Group .....	103
Table 11. Physical and Mental Health Comorbidities, by Group .....	104
Table 12. Demographic, Questionnaire and Dot-Probe Analyses, by Group .....	106
Table 13. Affective/Neutral Trials Analyses, by Group .....	109
Table 14. Holm's Adjusted $p$ Values for Multiple Comparisons.....	110
Table 15. Hierarchical Regression One: Global-Affective Bias.....	114
Table 16. Hierarchical Regression Two: Negative-Affective Bias.....	115
Table 17. Hierarchical Regression Three: Positive-Affective Bias .....	116

## List of Appendices

Appendix 1. Figure Reproduction Permissions (Crick and Dodge, 1994) .....	171
Appendix 2. Figure Reproduction Permissions (Palmer, 2003) .....	172
Appendix 3. Systematic Literature Review Screening Criteria .....	173
Appendix 4. Databases and Terms String for Identifying Articles.....	174
Appendix 5. Study Selection and Exclusion Process.....	175
Appendix 6. Staff Information Sheet .....	176
Appendix 7. Participant Information Sheet.....	178
Appendix 8. Flow Chart to Show Recruitment Procedure.....	182
Appendix 9. Flow Chart to Show Two Trainees Involvement in the Research.....	183
Appendix 10. Data Collection Pack .....	184
Appendix 11. Images for the Dot-Probe Task .....	195
Appendix 12. Practice Images for the Dot-Probe Task.....	201
Appendix 13. Consent Form .....	202
Appendix 14. Visual Analogue Scale .....	204
Appendix 15. Favourable Ethical Opinion.....	206
Appendix 16. Local NHS Permissions.....	210
Appendix 17. Results: Kolmogorov-Smirnov Tests .....	220
Appendix 18. Results: Homogeneity of the Regression Slopes.....	221
Appendix 19. Results: Correlation Analyses of Study Variables with Attentional Bias Indices.....	222

## Abstract

**Introduction:** Theories of moral reasoning, empathy and information processing have long been used to explain offending behaviour in people with intellectual disabilities (ID), and the way in which attention is allocated to stimuli is thought to be integral to developmental models of offending that incorporate these ideas (Garrigan & Langdon, In Press). The present study sought to examine empathy and attentional bias in ID offenders (IDO) and ID non-offenders (IDNO). **Methods:** Men with mild ID (IDO  $n = 34$ ; IDNO  $n = 32$ ) completed a self-report empathy measure, and an affective dot-probe task containing negative, positive, and neutral images. Reaction times (RT) to computerised trials were recorded. **Results:** (1) The IDO group had significantly lower empathy scores than the IDNO group; (2) within group comparisons showed that RT in the IDO group were similar across trial types, whilst the IDNO group had significantly slower RT the affective trials than neutral trials; (3) between group analysis revealed a significant group difference in attentional bias for negative-affective and global-affective stimuli (positive and negative images collapsed together); and (4) across all participants, attentional bias could not explain a significant percentage of the variance in empathy. **Discussion:** The findings suggest that IDO attentional allocation is unaffected by the stimuli content, whilst attention in the IDNO group is significantly biased away from negative- and global-affective information in comparison to IDO. However, attentional bias could not explain any variance in empathic abilities. The findings provide some support for the application of attentional theories of information processing to this population. Further research in people with ID could lead to the use of attentional bias paradigms as unbiased pre- and post-intervention measures, and may even have application in an intervention context, in the form of cognitive bias modification.

# **1 Introduction**

## **1.1 Chapter Overview**

A minority of people with intellectual disabilities (ID) are known to engage in antisocial or offending behaviours, and the impact of their offending has far reaching implications for society. ID offenders (IDO) are also a particularly vulnerable population; they are susceptible to exploitation in the community, risks to their health and wellbeing are enhanced in the criminal justice service, and the effects of long term detention can have a considerable negative impact. Consequently, innovative theories and interventions are being sought to ameliorate these risks, to improve outcomes for all.

Psychological models are receiving increasing attention in this endeavour, and this study aims to generate new evidence that can contribute to our understanding of people with ID who offend. This chapter opens with a historical backdrop to ID and offending. It then goes on to discuss psychological theories of offending – moral reasoning, empathy, and information processing, and considers how these form part of more comprehensive developmental models of offending in people with ID. A single aspect of these models, attentional bias, will then be considered in detail, and a systematic literature review of attentional bias investigations in non-ID offenders is discussed. The chapter closes with a rationale for the present study, and the research questions and hypotheses.

## **1.2 Intellectual Disabilities and Offending**

### **1.2.1 Section Overview**

Section 1.2 begins by providing the context of the clinical population examined in this thesis. It will consider the historical background of people with ID, the prevalence rates and characteristics of this group, and the relationship between ID and

offending. Methodological issues pertinent to research in this population will also be discussed.

## **1.2.2 Intellectual Disabilities**

### **1.2.2.1 Historical and Recent Context**

Defining and understanding ID has historically been complex, and consequently, it has been socially constructed and reconstructed over time (Hatton, 1998). In the late 19<sup>th</sup> and early 20<sup>th</sup> century, one approach to conceptualising ID was to categorise people according to whether the aetiology of their disability could be established (Carr, O'Reilly, Noonan Walsh, & McEvoy, 2007; Scheerenberger, 1983). The literature distinguished individuals with 'pathological conditions caused by organic insult', from 'subcultural mental defectives', who had no identifiable cause of their impairments (Down, 1887; Lewis, 1933; Tredgold, 1908). Another approach was to consider deficits in intellectual capability and defects of congenital aetiology as being integrally linked to moral insanity, or immorality (Maudsley, 1872). For many years, the terms 'moral idiot' and 'moral imbecile' were associated with people with ID (Trent, 1994). It was argued that the majority of people who engaged in immoral behaviour did not have normal levels of intelligence, and as such, were 'morons' (Goddard, 1919). Research at that time suggested that half of people who were in prisons were 'mentally defective' (Goddard, 1914).

During the eugenics movement of the 20<sup>th</sup> Century, it became an established idea that people with ID were a threat to society (Taylor & Lindsay, 2010), and when the Mental Deficiency Act was established in 1913, courts were given the power to issue committal orders for any person deemed to be 'mentally defective' (Walker & McCabe, 1973). The impact of these academic, clinical, social and political ideas affected many

people with ID – both those who had and had not committed crimes – with sterilisation, and institutionalisation becoming commonplace. It was not until much later that the introduction of the National Assistance and Mental Health Acts (1948, 1959) brought about revisions of the terms used in legislation, that distinguished those with a ‘mental impairment’ from those who engaged in irresponsible or antisocial behaviour (Cope, 1995).

More recently, there have been regional differences in the terminology used to describe this population, with ‘mental retardation’ used in the USA, and ‘learning disabilities’ used in the UK, and increasingly, ‘intellectual disability’ is the preferred term. This current use of this label denotes a group of people with different, potentially multiple aetiologies, such as genetic abnormalities or chromosomal dysfunction, who have atypical intellectual development that results in a variety of lifelong conditions and behavioural phenotypes (Carr et al., 2007; Harris, 1995). With the advent of neuropsychological testing, formalised diagnosis of ID has been possible since the beginning of the 20<sup>th</sup> century. Based on the concept of intellectual quotient (IQ; Detterman, Gabriel, & Ruthsatz, 2000), the main premise of assessing IQ in this group of people was that impairments in cognitive skills were a ‘symptom’. However, it has since been acknowledged that this is insufficient criteria for determining ID, and that adaptive functioning or behaviour (i.e. age appropriate behaviours which individuals require in order to live independently and safely) must also be assessed. For some time, diagnostic systems utilised concepts of both IQ and adaptive functioning, but most recent definitions have moved away from the use of IQ (see Table 1).

**Table 1. Classification Systems Describing Intellectual Disabilities**

ICD-10 / WHO (1992)	DSM-IV-TR (2000)	DSM-5 (2013)
<p>For a diagnosis, there should be a:</p> <ul style="list-style-type: none"> <li>A. Reduced level of intellectual functioning' resulting in:</li> <li>B. Diminished ability to adapt to the daily demands of the normal social environment.</li> </ul>	<p>Diagnostic criteria:</p> <ul style="list-style-type: none"> <li>A. Significantly sub-average intellectual functioning - an IQ of 70 or below,</li> <li>B. Concurrent deficits or impairments in present adaptive functioning,</li> <li>C. Onset before 18 years.</li> </ul>	<p>Diagnostic criteria:</p> <ul style="list-style-type: none"> <li>A. Deficits in general mental abilities,</li> <li>B. Impairment in adaptive functioning for the individual's age and sociocultural background,</li> <li>C. Onset during the developmental period.</li> </ul>
<p>Four classifications:</p> <ul style="list-style-type: none"> <li>1. Mild: Ability to use speech in everyday situations; usually full independence in self-care; IQ between 50-69.</li> <li>2. Moderate: Slow in comprehension; supervision of self-care, retarded motor skills; IQ between 35-49</li> <li>3. Severe: Marked impairment of motor skills; clinically significant damage to CNS; IQ between 20-3.</li> <li>4. Profound: severely limited understanding, immobility or restricted mobility, incontinence, constant supervision; IQ &lt;20, usually organic aetiology.</li> </ul>	<p>Degree of severity reflects level of intellectual impairment:</p> <ul style="list-style-type: none"> <li>1. Mild: IQ level 50-55 to approximately 70</li> <li>2. Moderate: IQ level 35-40 to 50-55</li> <li>3. Severe: IQ level 20-25 to 35-40</li> <li>4. Profound: IQ level below 20 or 25</li> <li>5. Mental Retardation, Severity Unspecified - when there is strong presumption of Mental Retardation but the person's intelligence is untestable by standard tests.</li> </ul>	<p>Four severity levels: Mild, Moderate, Severe and Profound, based on the three domains of adaptive behaviour (IQ criteria no longer central to the diagnosis):</p> <ul style="list-style-type: none"> <li>1. Conceptual: e.g. language, reading, writing, maths, reasoning, knowledge, memory.</li> <li>2. Social: e.g. awareness of others' experiences, interpersonal skills, friendship abilities, self-regulation.</li> <li>3. Practical: personal care, job responsibilities, money management, recreation, managing one's behaviour, and organizing tasks.</li> </ul>

*Note: ICD-10 / WHO - International Statistical Classification of Diseases and Related Health Problems / World Health Organisation; DSM-IV-TR - Diagnostic and Statistical Manual of Mental Disorders, 4<sup>th</sup> Edition – Text Revision; DSM-5 - Diagnostic and Statistical Manual of Mental Disorders, 5<sup>th</sup> Edition.*

The World Health Organisation (WHO; 2001) estimates the global prevalence of ID is 1% - 3% (Gillberg & Soderstrom, 2003), and a recent estimate using data from 24 local authorities suggests 985,000 people in England have an ID (Emerson & Hatton, 2008). Within this, approximately 25% of people with ID are believed to have a disorder of known (prenatal, perinatal, or postnatal) aetiology, 25% have a suspected, but unconfirmed aetiology, and 50% have disorders of unknown aetiology (Cans et al., 1999). Some specific types of ID are investigated within modern literature due to their established cause or shared behavioural phenotype, but many studies examine the population as a whole, assuming a certain degree of heterogeneity based on intelligence and overall functioning. In the present study, the literature examining ID of all aetiologies will be considered.

#### **1.2.2.2 Population Characteristics**

People with ID are a heterogeneous population, with a wide variety of cognitive, social, physical and behavioural skills and needs. They may have difficulties with interpersonal skills, receptive or expressive communication needs, or problems with fine and/or gross motor functions (Carr et al., 2007). They can have impairments in executive functions, such as planning, problem solving, or organisation, or deficits in processes such as response inhibition, attention shifting, or working memory (Pennington & Ozonoff, 1996). They have an elevated incidence of mental health problems; rates of anxiety, depression, and psychosis are significantly higher than in the general population (O'Brien, 2002), and when making appropriate adaptations to diagnostic criteria, prevalence rates of mental health problems in people with ID vary between 30% and 50% (Cooper, 1997; Lund, 1985). They also have a greater incidence of physical health problems, which frequently go undetected and untreated (Lennox & Kerr, 1997).



In addition to these difficulties, people with ID and their families are at increased risk of adverse socio-economic circumstances (Emerson & Hatton, 2008). It is estimated that only 10% of people with an ID are in employment (Department of Health, 2001) and this is associated with poorer quality of life (Beyer, Brown, Akandi, & Rapley, 2010). People with ID also have difficulties accessing housing, and as this often enables people to access social and community networks, they are also at risk of social exclusion (Bryan & Bryan, 1978; Department of Health, 2001). Societal attitudes towards people with ID also contribute to them being a marginalised group. Quantitative research suggests that people hold both overt and covert negative attitudes towards people with ID (Akrami, Ekehammar, Claesson, & Sonnander, 2006), and 90% of people in this population have reported experiencing harassment and abuse (Sin, Mguni, Cook, Comber, & Hedges, 2010).

### **1.2.3 Intellectual Disabilities and Offending**

As early as the turn of the last century, assessment results from adults in prison populations were argued to indicate link between offending behaviour and impaired intelligence (Goddard, 1914). More recently, the idea that offenders have lower IQs on average, in comparison to the general population, has been supported (Goodman, Simonoff, & Stevenson, 1995; Hernstein & Murray, 1994). For example, Hirschi & Hindelang (1977) found that IQ was a good predictor of criminal behaviour within different racial or social groupings, and Hodgins (1992) found that men and women with ID were three and four times more likely, respectively, to offend than people without an ID. Assessment of a cross-sectional prison sample using the Wechsler Adult Intelligence Scale and the Vineland Adaptive Behaviour Scales found that 7-10% of the population had an ID (defined as an IQ under 70), whilst 23-33% had an IQ in the borderline range (Hayes, Shackell, Mottram, & Lancaster, 2007).

Although there appears to be an association between criminal activity and intelligence, this relationship is not necessarily linear. Some authors suggested that the majority of offenders fall “in the low normal or borderline subnormal range...their relative frequencies decline on either side of this range” (p. 155, Wilson & Herrnstein, 1985), suggesting the relationship between IQ and offending may instead be curvilinear. A recent large scale study of national self-reported offending data using a variety of assessment tools supports this idea. Mears and Cochrane (2013) found that people with lowest and highest IQs had lower rates of offending than those in the middle of the continuum. Thus, whilst IQ may be associated with offending, until recently, the nature of this relationship may have been misunderstood.

In part, this may be due to a number of methodological problems in investigating this relationship, particularly with regards to difficulties in obtaining “true” offending statistics in people with ID. For example, people with an ID have an increased likelihood of diversion from the criminal justice process before they enter it (Cullen, Gendreau, Jarjoura, & Wright, 1997). Furthermore, for an act to be deemed criminal in British law, intent or a guilty “state of mind” must be present (Holland, Clare, & Mukhopadhyay, 2002). This can be problematic to ascertain in people with ID, and so many people with an ID are not charged. Conversely, if people with a lower IQ give an insufficient or incomplete account of their activities, they may be more likely to receive a less severe sentence than people without an ID (Williams, 2008).

However, there is little explanation of the causal relationship between intelligence and offending, and many studies have often inadequately controlled for potentially confounding factors. Interestingly, a leading longitudinal investigation gave some attention to the role of such factors. In the Cambridge Delinquency Study, it was reported that almost double the number of boys who engaged in criminal activity were in

a low, rather than high, IQ group, and almost a third of these went on to be convicted of criminal offences (Lynam, Moffitt, & Stouthamer-Loeber, 1993; West, 1982). However, they also found that low non-verbal ability was related to low socioeconomic status, poor school attainment, high truancy, and early school leaving, raising an important issue regarding how the relationship between these two variables is commonly studied. Most frequently, studies have examined offenders who, as a consequence of social disadvantage, disruptive behavioural disorders, and poor education histories, have lower IQs, rather than specifically examining people with an ID. Therefore, it is possible that studies are not truly measuring intelligence, but perhaps are examining educational attainment and background.

### **1.2.3.1 Population Characteristics**

The prevalence of people with ID in the criminal justice system ranges between 0.6% and 39.6% (Holland, 1991; MacEachron, 1979), and there are data to suggest that in comparison to the general population, almost double the expected number of people with an ID are sectioned under the Mental Health Act and detained in secure NHS facilities (Taylor & Lindsay, 2010). In part, this may be due to some of the methodological issues previously discussed, and it is interesting to note that when using standardised diagnostic criteria (APA, 1994) with the application of an appropriate confidence interval ( $\pm 5$  points from an IQ of 70), prevalence rates of offenders with ID triples from 2.9% to 9.4% (Hayes et al., 2007).

Several studies have sought to identify the topography of IDO. People with ID who have offended are likely to be male, from a low socioeconomic background, have a history of behavioural problems (Simpson & Hogg, 2001), and have an IQ in the “mild” range (Salekin, Olley, & Hedge, 2010). They are also reported to often be from abusive, neglectful or disruptive families, in need of supported accommodation, and typically

have chaotic lifestyles (Glaser & Florio, 2004). Comorbid mental health problems are also high in this group. Smith, Quinn and Lindsay (2000) reported a 22% prevalence rate, mainly comprising mood disorders and schizophrenia, and when considering both mental health problems and substance abuse, a recent report suggested prevalence in this population is as high as 90%, with approximately 68% substance and alcohol abuse and 36% personality disorders (Mannynsalo, Putkonen, Lindberg, & Kotilainen, 2009).

Women are thought to comprise a small (less than 10%) percentage of the population, yet they are overrepresented in the criminal justice system (Lindsay, Smith, et al., 2004). In comparison to male ID offenders, they have higher rates of mental health problems, and lower levels of reoffending (Lindsay, Smith, et al., 2004), and due to social, political and cultural reasons, comprise a particularly marginalised and oppressed population (Kendall, 2004). It should be noted that comparatively very few studies consider females with ID, and as such, they are often misrepresented within large scale reports, research, and treatment considerations.

Patterns of offending in people with ID vary across samples. Murphy, Harnett and Holland (1995) indicate assault, burglary and drug offences are common, while Klimecki, Jenkinson and Wilson (1994) found highest offence rates for theft/robbery, assault and sexual related offences, and Mabile (1982) reported burglary/breaking and entering, and sex offences were most common. The prevalence of vehicle-related offences and white collar crime is very small, as people with ID are unlikely to drive or to have the abilities or motivations to commit offences such as fraud (Simpson & Hogg, 2001). There is also very limited evidence of offending in people with an IQ of less than 50, as they are unlikely to be deemed to have “mens rea” (guilty mind) according to criminal law (Simpson & Hogg, 2001).

There are a number of other features of IDO that are relevant to their engagement in criminal proceedings. They are vulnerable to acquiescence and coercion when being questioned (Hayes, 1996), have an elevated misunderstanding of criminal justice procedures and personal rights in comparison to non-ID offenders (Johnston & Halstead, 2000), and impaired competency with regards to standing trial and pleading guilty (Baroff, 1996). Furthermore, offenders with ID are at risk of being rejected by mainstream services due to high prevalence of mental health problems and perceptions that they are difficult to treat or present a greater risk to others (Lindsay, Taylor, & Sturmey, 2004). Consequently, offenders with ID are amongst those detained for the longest in secure facilities, and have complex and difficult discharges (Johnston & Halstead, 2000; Murphy, 2000).

#### **1.2.3.2 Interventions**

In comparison to non-ID offenders, it is thought that IDO may require specific interventions that both target and accommodate their difficulties (Holland, 1991). For certain types of offenders, there are some offence specific issues which have been identified as beneficial to target (Clare and Murphy, 1998), however, a number of general areas of intervention are thought to be important for this population, such as addressing self-control and promoting personal responsibility (Day, 1993). The majority of recent studies support the use cognitive and behavioural therapies and social skills training in IDO (Barron, Hassiotis, & Banes, 2002). Although there have been long held assumptions that the cognitive difficulties experienced by people with ID render them unfit for such interventions, a growing body of literature in this field suggests this is starting to change, and a recent meta-analysis suggest that treatment is efficacious with a moderate effect size (Vereenoghe & Langdon, 2013). There is also a small body of

evidence for other therapies, such as dialectical behaviour therapy (e.g. Morrissey & Ingamells, 2011).

Consideration of offence specific treatments does not offer clear advice for clinicians and services. For example, Hamelin, Treavis and Sturmey (2013) reviewed anger management interventions, and although they acknowledged they are important in people with ID who have high rates of aggression and impulsivity, many of the studies considered could not demonstrate clear behavioural change. A review of the sex offender literature revealed similar problems. There is a reasonable research base in this field, where studies typically make use of cognitive and behaviour management and skill acquisition, however Ashman and Duggan (2002) note that there is no 'gold standard' evidence from randomised controlled trials to guide this field, and many studies have used small samples or uncontrolled designs. Recently, the Sex Offender Treatment Services Collaborative for people with ID offered encouraging evidence for cognitive and behavioural interventions, demonstrating that a manualised treatment approach led to significant reductions in victim empathy and distorted sexual cognitions, maintained at a six month follow up (Sex Offender Treatment Services Collaborative – Intellectual Disabilities, 2010).

Overall, many of the studies that do exist are case studies or case series, and whilst these may offer the possibility of identifying the key components and processes at work (Clare and Murphy, 1998), this stands in contrast to the dominant use of randomised control trials in the general population. Furthermore, many studies indicate that treatment outcomes for offenders are mixed: Baron, Hassiotis and Banes (2004) reported that that recidivism rates following treatment are between 0% and 85%, whilst Lindsay (2002) suggests that up to 69% of people who have not received treatment reoffend. Thus whilst psychological interventions offer a great deal of potential for

change in offending populations, significantly more research is needed if outcomes are to be improved, and the key mechanisms for change are to be more precisely defined.

#### **1.2.4 Section Summary**

People with ID make up at least one percent of the general population. By definition, their IQ is below average, and they can experience a wide range of impairments across cognitive, adaptive, and communicative domains, often compounded by an increased incidence of mental and physical illness and social exclusion. A substantial research body has shown that a relationship exists between IQ and offending, and offenders with ID are also a vulnerable and heterogeneous population. Despite a clear need to understand the needs of IDO and understand how offending behaviour arises, the research in this area is lacking in quantity and quality, and is fraught with methodological problems. Such issues impact upon the development of evidence based treatments that are needed to improve outcomes in this population. An increasing body of evidence has examined treatment programmes in different types of offender with ID, and although many are promising, they cannot offer reliable conclusions regarding which treatments, or aspects of treatments, best meet individual needs. Effective treatment programmes for IDO should be based on robust, well researched theories of offending. The following section will therefore explore models and theories of offending, and consider how they can be applied to people with ID.

### **1.3 Theories and Models of Offending**

#### **1.3.1 Section Overview**

Theoretical explanations of offending are intrinsically linked to clinical practice, and are used to guide the format of assessments, formulation, treatment and evaluation of individuals and their difficulties (Ward, Polaschek, & Beech, 2005). This section will review some of the relevant theories and models of offending. Many contemporary

theorists focus on a single dimension of mind or behaviour and its associated explanatory processes, and this section will begin by briefly reviewing three key theories: moral reasoning, empathy, and information processing. This will be followed by a discussion of developmental models of offending behaviour that incorporate these ideas, which have application to IDO populations.

### **1.3.2 Theoretical Explanations**

#### **1.3.2.1 Moral Reasoning**

Moral reasoning theories refer to the processes a person engages in when making decisions about whether an object or action is “right” or “wrong” (Langdon, Clare, & Murphy, 2010). It offers a developmental framework for understanding how people make moral judgments, based on the idea that such decisions change and typically mature over time. Piaget (1932) viewed the development of morality as process of constructing ideas and ideals around justice and equality that develop in line with logical reasoning. He broadly suggested that moral reasoning could be developed through emphasis on cooperative decision making and opportunities for problem solving, and that children’s reasoning developed from being governed by laws or standards, to reliance on individual and societal principles.

However, these ideas were only developed to account for development between infancy and adolescence. Kohlberg (1969) expanded upon this, viewing justice to be the essential characteristic of moral reasoning. He suggested moral development progressed from an egocentric view where rules are viewed as being outside of the individual, through to a complex understanding of laws, circumstances in which they can be challenged, and ethical principles. Both theoretical perspectives considered that individuals increasingly aim to make sense and create structure within their world, and



so higher order levels of reasoning can only be attained through a successful, upwardly linear progression through lower levels.

Despite its development of the field, this model attracted a number of criticisms (Gilligan, 1982; Snarey, 1985; Sullivan, 1977), in particular, its over reliance on a cognitive-developmental perspective of morality, and minimisation of the possible role of emotion in moral judgement (Palmer, 2003). Accounting for these limitations, Gibb's (Gibbs, 1979, 2013) developed a sociomoral model that emphasised the role of social interaction. Gibb's contested that reasoning could be concrete and superficial, or based on a more mature understanding of interpersonal relationships and consideration of societal needs. Eisenberg (1989) also went on to highlight more empathic, prosocial components of moral behaviour that rely on a person's ability to perspective take and understand how others may feel. In particular, she argued that concepts of sympathy (an affective response of sorrow or concern for another) and personal distress (a feeling of discomfort in response to someone else's situation) are implicated in prosocial development and action. The progression of these ideas are summarised in Table 2.

#### 1.3.2.1.1 *Moral Reasoning and Offending*

Together, the application of these ideas to offending behaviour acknowledges that people commit offences for different reasons, and in different ways, depending on their stage of moral development. For example, a person operating at an early stage of moral reasoning may be likely to offend if they believe punishment can be avoided, whereas a person at a later stage may commit a criminal act as a result of a conflict of multiple moral principles. A wealth of empirical evidence supports the significant role moral reasoning plays in offending, and a recent large scale meta-analysis ( $n = 15,992$  offenders) has shown that there is a significant inverse relationship between moral development and criminal acts (Van Vugt et al., 2011). Despite small to moderate effect

**Table 2. Key Developments in Moral Reasoning Theories**

Piaget (1932)	Kohlberg (1969)	Gibbs (1979)	Eisenberg (1989)
<p><b>Heteronomous moral reasoning</b> A view of people as either right or wrong; rules are perceived to be inflexible and imposed by authority figures, and children appeal to the consequences, rather than the intentions, of an act. This phase is characterised by egocentric thinking - where children are unable to simultaneously hold theirs and others perspectives. Their relative social relationship and power imbalance with adults is also key.</p> <p><b>Autonomous moral reasoning</b> Individuals learn that rules are developed by society, for the benefit of society, and are governed by principles of fairness and justice.</p>	<p><b>Level 1: Pre-conventional</b> <i>Stage 1: Heteronomous Morality</i> Decisions are based on obedience of authority and avoiding punishment. <i>Stage 2: Individualism and Instrumental Purpose</i> Own needs are viewed as highest priority. Decisions based on personal views of reward and punishment.</p> <p><b>Level 2: Conventional</b> <i>Stage 3: Mutual Interpersonal Expectations and Relationships</i> Decisions taken in relation to other people's needs, where the relationship is perceived to be important. <i>Stage 4: Social System and Conscience</i> Decisions are made in the context of societal laws and rules, with an aim of ensuring order is maintained.</p> <p><b>Level 3: Postconventional</b> <i>Stage 5: Social Contract and Individual Rights</i> Decisions made within the framework of overarching values, taking into consideration that different views will be held by different groups. <i>Stage 6: Universal Ethical Principles</i> Well-developed ethical arguments underpin decisions, taking into consideration justice, dignity etc.</p>	<p><b>Level 1: Immature</b> <i>Stage 1: Unilateral and Physicalistic</i> Moral decisions are based on obedience of authority figures and avoiding punishment. <i>Stage 2: Exchanging and Instrumental</i> Moral decisions are based on superficial understandings developed from social interactions. Reasoning is concerned with the needs of the self, or others.</p> <p><b>Level 2: Mature</b> <i>Stage 3: Mutual and Prosocial</i> Decisions are based on a prosocial understanding of emotional states, care, and appropriate conduct. Emphasis is placed on the consequence of behaviour for others. <i>Stage 4: Systemic and Standard</i> Decisions are based on complex understandings of rights, values, social structures, justice, responsibility and conscience.</p>	<p><b>Self-centred reasoning</b> Priority of perceived consequences to self, consideration personal costs and benefit, expectations of reciprocity.</p> <p><b>Needs-oriented reasoning</b> Express concern for other's needs even though there may be a conflict with one's own needs. No role-taking or empathy.</p> <p><b>Stereotyped and/or approval-oriented reasoning</b> A desire to win approval, and stereotyped ideas of good/bad people and good/bad behaviour.</p> <p><b>Empathic reasoning</b> An awareness of the emotional consequences of giving or withholding help. Some use of role-taking, empathy, and perspective taking.</p> <p><b>Partly internalized principles</b> Justifications for actions involve some personal values, such as concern for others' rights.</p> <p><b>Strongly internalized principles</b> Justifications for actions are based on strongly-held internalized values, such as belief in equality of all, with the emotional consequences of self-respect.</p>

sizes, this was found across men and women, adults and adolescents, and self-reports and official reports, using different types of assessment tools, suggesting this relationship is relatively robust.

It is also interesting to note that, similar to the curvilinear relationship between IQ and offending (Mears & Cochran, 2013), there may be a similar pattern between moral reasoning and offending. Richards, Cooper, Coder, Masnaz and Anderson (1992) suggest that at early moral stages, antisocial or disruptive behaviour is minimised as emphasis is placed on obeying rules; this behaviour increases at the mid stages, where an individuals' own needs take priority; and at latter stages it decreases again, as there is greater emphasis on the development and maintenance of relationships. In support of this, a review of adolescent studies (Gibbs, 2013) noted a prevalence of early level (stage 2) reasoning has been noted in adolescents who offend, whilst age matched non-offenders gave higher level (stage 3) reasoning in their understanding and obeying of the law.

### **1.3.2.2 Empathy**

Empathy is “the ability to understand and share in another’s emotional state or context” (p988, Cohen & Strayer, 1996), or “an affective response more appropriate to someone else's situation than to one's own" (p48, Hoffman, 1987). Some of the earliest and most influential studies in this area suggest that empathy can be divided into two elements: emotional or affective empathy, and cognitive empathy (Davis, 1980).

Affective empathy describes the sharing of the emotional state or context of another (Eisenberg & Strayer, 1987), namely, the felt experience of an emotion. It motivates people to engage in altruistic behaviours, and in so doing, facilitates familial bonds and promotes group cohesion (Plutchik, 1987). Cognitive empathy refers to a more intellectual understanding and identification of the experience of another person, their

perspective, or their internal states (Cronbach, 1955; Ickes, 1997). It facilitates social expertise, and enables people to understand and predict the behaviour of others, based on their attributed mental states.

Early research investigated empathy as a dichotomous construct (Davis, 1980), but many theorists also acknowledge these ideas may be interdependent. Consequently, theories of empathy can either be heavily reliant on either cognitive, or affective components, or can assimilate these ideas (Hoffman, 1977). For example, theories of perspective taking explain how a person may take an alternative perspective in order to form ideas about what another person other knows, feels, thinks, and believes (Kraus & Fussell, 1996), whilst social mindfulness theory places emphasis on will and motivation for empathic concern and prosocial orientation (Van Doesum, Van Lange, & Van Lange, 2013).

Emotional states are associated with highly motivated behaviours, and the relationship between empathy and moral behaviour can be most easily seen in prosocial actions. Hoffman (2000) posits that empathic distress functions as a prosocial moral motivation to act, and that this is automatically and without conscious awareness. He identified five key modes that are necessarily part of this process, which develop from birth through to adulthood (Table 3). He suggests that the ‘primitive’ modes comprise the more basic components of an empathic response; mimicry, conditioning and direct association enable a person to demonstrate an affective or emotional response. As language and cognition develop, more ‘mature’ modes of verbally mediated association and social perspective taking come into play, and behavioural responses become increasingly reliant on cognitively advanced processes.

As empathic responses that occur through the higher order modes are more cognitively complex, they permit a deeper connection to others than does empathy from

only the basic modes. Furthermore, although they are more subject to effort and voluntary control, they can be triggered immediately and have the potential to be fast acting and involuntary. Thus, those engaging in higher modes have the ability to consider others who are not physically present, and consequently, to consider moral dilemmas such as whether they might feel guilt if they were to harm another person, or to consider another person's needs when deciding upon their own actions.

**Table 3. Hoffman's Developmental Model of Empathy**

Mode	Description
<b>Primitive/Basic Modes</b>	
<i>Motor Mimicry</i>	Involuntary imitation of another's facial or motor movements. Feedback enables the individual to feel what another feels.
<i>Classical Conditioning</i>	Pairing of the other's distress, with one's own distress, thereby developing an association between distress cues and affective responses
<i>Direct Association</i>	The observed external cues of affect in the other acts as a reminder of previous experience of one's own distress, causing an emotional response.
<b>Higher Order Cognitive/Mature Modes</b>	
<i>Verbally Mediated Association</i>	The experience of emotion via communication of the other's distress through written or spoken language. Emotional response occurs independently of direct observation.
<i>Social Perspective Taking</i>	Imagining the self in the other's place.

In support of the idea that actions are contingent on both empathy and moral reasoning, Seara-Cardoso, Neumann, Roiser, McCrory and Viding (2011) examined a community sample of non-offenders. They found that affect and interpersonal features psychopathic traits, such as reduced guilt and attachment to significant others, were significantly related to reduced affective responses and propensity to feel empathic

concern – a moral emotion that influences behaviour (Eisenberg, 1989). They also found these affective and interpersonal features were associated with less difficulty in making decisions on moral dilemmas, and argued this may be suggestive of a heightened emotional disengagement.

As there are a number of ways that empathy can be conceptualised, it is perhaps not surprising that there are a number of different assessment tools. Many measures typically rely on self-report through a questionnaire format, asking people to rate statements that tap into particular aspects of empathy and then summing the responses into a single empathy score (e.g. Baron-Cohen and Wheelwright, 2004). However, as questions asked can often elicit both cognitive and affective processes, this does mean that outcomes on these measures often conflate multiple constructs (e.g. Mehrabian & Epstein, 1972), and in addition, these sorts of measures are open to social desirability bias. Alternative measures that are not questionnaire based can overcome some of these problems, for example, through directly observing and measuring participants effortful response or decisions to another person's perspective (e.g. Van Doesum et al., 2013). However, at present no “gold standard” form of measurement exists (Preston & de Waal, 2002).

#### 1.3.2.2.1 *Empathy and Offending*

Recognition of affective information is a key regulator of behaviour (Frijda, 1986), and consequently, the relationship between empathy and offending has been explored in some detail. An individual who can comprehend or share the emotional reaction another person holds towards socially unacceptable behaviour is less inclined to act, or continue to act, in this way themselves (Feshbach, 1975; Zahn-Waxler & Robinson, 1995). It is therefore postulated that deficits or dysfunctions in empathy are associated with criminal behaviour (Hogan, 1969), and offenders are thought to have

reduced sensitivity to the thoughts and feelings of others, poor perspective taking, and poor awareness of the effects of their actions on others (Farrington, 1998).

Reduced or impaired empathy has long been found to be associated with behaviour such as aggression (Miller & Eisenberg, 1988), conduct disorder (Cohen & Strayer, 1996), and psychopathy (Soderstrom, 2003), and some of the early studies of empathy and offending suggested people who engaged in antisocial behaviour had lower cognitive empathy (Hogan, 1969) and lower affective empathy (e.g. Kendall, Deardorff, & Finch, 1977). However, a number of methodological problems existed in this early work, particularly with regards to the samples investigated, and since more robust methods have been applied it has transpired that the relationship between empathy and offending is not necessarily straightforward. Reviews have shown that the correlation coefficient between empathy and offending is in the low to moderate range (Jolliffe & Farrington, 2004; Miller & Eisenberg, 1988), and examination of these findings suggests that intelligence is a significant mediating variable in this relationship. Furthermore, when additionally controlling for socio-economic status, the relationship can be explained away altogether, suggesting that empathy may be a function of other factors known to be related to offending, rather than having a direct, causal relationship.

Models of empathy in offenders are broadly similar to general theories of empathy. For example, Marshall, Hudson, Jones, and Fernandez (1995) suggest the empathic process comprises: (1) the accurate recognition of an emotional state in another person, (2) perspective taking, (3) evocation of a fitting emotional response, and (4) a response decision. Models such as this have particular utility in this context, as they can help to localise idiosyncratic empathy impairments in offenders. For example, sex offenders have been shown to have impaired recognition and misinterpretation of others emotions in comparison to controls and non-sex offenders (stage 1; Gery,

Miljkovitch, Bethoz, & Soussignan, 2009), whilst violent sex offenders had impaired perspective-taking skills (stage 2; Hanson & Scott, 1995). This may be evidence to suggest that offenders do not have global deficits in empathy, but rather, have specific deficits, and that these are amenable to examination.

Another model of empathy that can be applied to offending is that by Proctor and Beail (2007) which draws together previous theoretical ideas (Davis, 1983; Geer, Estupinan, & Manguno-Mire, 2000; Goldstein & Higgins D'Alessandro, 2001; Keenan & Ward, 2000; Marshall et al., 1995; McFall, 1990; Tager-Flusberg & Sullivan, 2000). They outline five distinct cognitive-affective processes that lead a person to empathic, or un-empathic action: (1) perception/emotion recognition, (2) cognitive comprehension – acknowledging and understanding the existence of alternative perspectives, (3) emotion replication – the experience of the other person's emotion, (4) cognitive evaluation of these processes in order to guide decision making, and (5) the actions taken. Interestingly though, when examining this model in IDO, contrary to their hypotheses, they found that IDO performed better at stages 1, 3, 4 and 5, than ID non-offenders. Similar results were also observed in a sample of sex offenders with ID (Ralfs & Beail, 2012).

In spite of the mixed evidence for the role of empathy in offending, many treatment programmes have been designed to improve empathy (e.g. Serin & Kuriyчук, 1994), based on the assumption that developing this skill will help to reduce recidivism rates. In recent years, such programmes have often taken a cognitive-behavioural approach, with the goal of targeting the cognitive associations and behavioural consequences of empathy that are key to offence behaviour (Wastell, Cairns, & Haywood, 2009).



### **1.3.2.3 Social Information Processing**

Information processing describes a sequence of operations that occur between two defined points, akin to a set of computational processes, that underpin human thinking (Juola, 1986). It considers how information comes from the external environment and is processed and manipulated through a set of internal cognitive structures, how this knowledge base is stored, integrated, and accessed, and how these cognitive processes underlie and mediate affect and behaviour. In current psychological discourse, biased or inaccurate information processing is believed to be one of the key ways in which problematic thoughts and behaviours arise, and theorists have attempted to delineate the different aspects of information processing in order to understand how such problems arise.

Ingram and Kendall (1986) suggest that there are four conceptually distinct, but inter-related cognitive variables that explain information processing, and biases at any of these levels are often term “cognitive distortions”. The first, structures, are akin to a hardware system; they comprise storage and organisations of information. The second, propositions are the cognitive content of stored information, used in order to make sense of the world in such a way that is idiosyncratic, but consistent with previous beliefs, experiences and expectations. The third, operations, are the processes that manage and encode incoming information, through attention to some stimuli, and not others (and can be guided by heuristics or affected by current emotional state, circumstances or motivations). Finally, products are the consciously accessible images and thoughts that result from all of these processes.

Theories of information processing have been developed to take account of the fact that a large percentage of the information that human’s process is social in content. One of the more comprehensive and well developed ideas is the recursive social

information processing model developed by Crick and Dodge (1994), which suggests that individuals receive information about social experience in the form of a set of cues, and that observable behaviours are a consequence of the processing of this contextual information. The authors propose six key steps to information processing (outlined in Table 4, and represented in Figure 1). These are suggested to occur rapidly, in parallel, and are dynamic in their content; that is, stored information will change with experience and development in cognitive functioning.

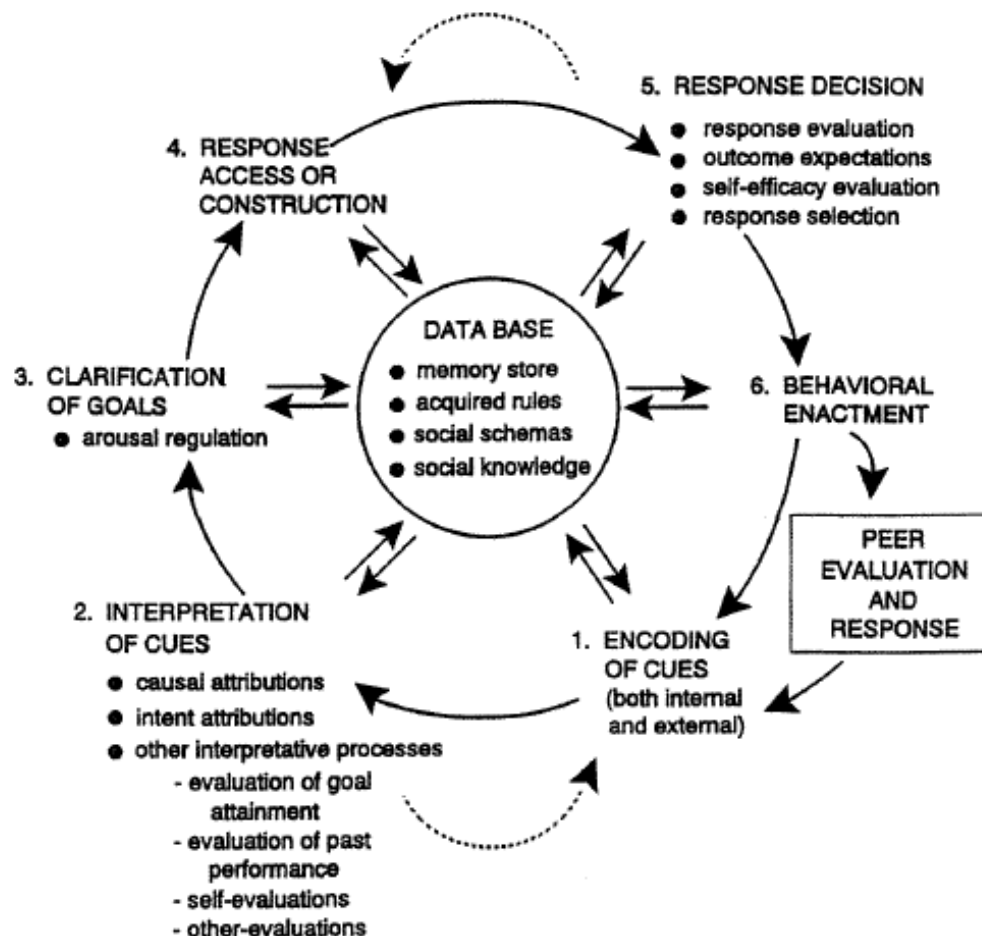
**Table 4. Crick and Dodge’s (1994) Social Information Processing Model**

Step	Description
1. Encoding of cues	Selective attention to particular internal and external cues.
2. Interpretation of cues	The cues are interpreted or mentally represented through a number of processes, such as personalised mental representation of the cue, a causal analysis of the situation, inferences about the perspectives of others, or inferences about the meaning of this exchange for themselves.
3. Clarification of goals	Selection of a goal or outcome for this situation.
4. Response access or construction	Possible responses to the situation are accessed from scripts held in memory, and are selected based on the current situation and/or goals. New behaviours are constructed if the situation is novel.
5. Response decision	The evaluation of previously accessed or constructed response, in order to choose one to perform. Criteria used to make this response include: outcome expectation, self-efficacy, response evaluation.
6. Behavioural enactment	Performance of response generated at step 5.

The relationship between the input of information and output of behaviour is influenced by a “database” of stored information (such as social schema, scripts, and social knowledge), together with a set of idiosyncratic, pre-existing capabilities.

Schema and scripts are deep level cognitions that offer ways of storing information acquired through experience, and that organise new incoming information according to

the nature of existing knowledge. They function as unconscious, causal theories, that develop from one's own experiences and interactions with others, particularly at an early age (Ward, 2000).



**Figure 1. Crick and Dodge's (1994) Social Information Processing Model.**

(Reprinted with permission, see Appendix 1)

This model was proposed to explain antisocial behaviour in children. For example, evidence suggests problematic encoding and interpretation of information exists in aggressive children. They have been found to have selective attention to certain

cues from social interactions, were more likely than their peers to rely on internal schemata to interpret social situations than non-aggressive children (Dodge & Tomlin, 1987), and were more likely to be hypervigilant to threat information (Ribordy, Camras, Stefani, & Spaccarelli, 1988). Aggressive children and adolescents have also been shown to have an attribution of hostile intent in their perception of others, which can mean ambiguous cues are incorrectly interpreted as threats (Nasby, Hayden, & DePaulo, 1980).

These encoding and interpretation problems may be understood in context of negative early experiences, which are formative in the nature of scripts and schema. In this model, this top-down style of processing can result in vital cues from a social situation being missed; by comparison, non-aggressive children's reliance on a bottom-up information processing style meant greater emphasis is placed on social cues, which are later incorporated into existing schemata. There is some evidence to suggest that interventions specifically designed to improve socio-cognitive processes may be helpful; for example, the recent "Fast track" programme of social-cognitive process training for children found that working on these various processes throughout the school years can lead to the development of benign rather than hostile attributions and can increase social competence (Dodge, Godwin, & Conduct Problems Prevention Research Group, 2013).

Social information processing also has clear theoretical and observable links to empathy. In their perception-action model of empathy, Preston and deWaal (2002) argue that when a person attends to the emotional state of another, the observation or imagining of the person experiencing a particular emotional state will automatically activate a mental representation of that state in the observer (perception), and that the resulting empathy is the shared emotional experience (action). This model emphasises that the process of allocating attention to the state of the person/object is a key factor in

this sequence of events, and predicts the sort of stimuli an individual is drawn to, and consequently, feels an empathic reaction towards (Preston, 2007).

#### 1.3.2.3.1 *Social Information Processing and Offending*

In the offending literature, the most researched aspect of this model to date has been cognitive products (Segal & Stermac, 1990), and in particular, it is thought that cognitive distortions play a key role in the development and maintenance of offending behaviour (Polaschek & Ward, 2002; Ward, Gannon, & Keown, 2006). It has been proposed that atypical development can lead an individual to develop ‘offence permissive beliefs’ (Marshall & Barbaree, 1990), and it is suggested that offenders typically have cognitive distortions that support offence behaviour (Broxholme & Lindsay, 2003). Cognitive distortions can be measured using questionnaires, however they usually are open to transparency effects which can bias responding (Langton & Marshall, 2001). As a consequence of problems with such measures, and in order to better understand the aspects of information processing that are upstream of cognitive distortions (that is, the initial bias in the cognitive process), more automatic measures encoding of information are recommended (Langton & Marshall, 2001), yet this has been surprisingly under-researched to date.

Distortions and biases in information processing also link to problems in moral development. Gibbs and colleagues (Gibbs, 2013; Gibbs, Potter, Barriga, & Liao, 1996) suggest that offending behaviour can be explained by impaired or superficial moral reasoning, which is tied to a prolonged egocentric bias (a desire for one’s own needs to be met, irrespective of the impact this has on others), self-serving cognitive distortions (inaccurate schemas used in the perception of events that favour and protect the self when harm is done towards others), and poor social skills (based on deficient schemas that are used to regulate behavioural responses in interpersonal conflict). This is

supported by evidence that shows violent and aggressive behaviours correlate with self-serving cognitive distortions (Paciello, Fida, Tramontano, Lupinetti, & Caprara, 2008) and an inverse relationship between social skills and antisocial behaviour (Freedman, Rosenthal, Donahoe, Schlundt, & McFall, 1978; Simonian, Tarnowski, & Gibbs, 1991).

#### **1.3.2.4 Summary**

Moral reasoning, empathy and social information processing theories offer different explanations of how and why a behavioural response is taken, and so can be used to understand engagement in both pro- and antisocial behaviours. However, multiple factors are argued to better predict and conceptualise offending than theories in isolation (Deater-Deckard, Dodge, Bates, & Pettit, 1998), and so these ideas will be considered together in models of offending.

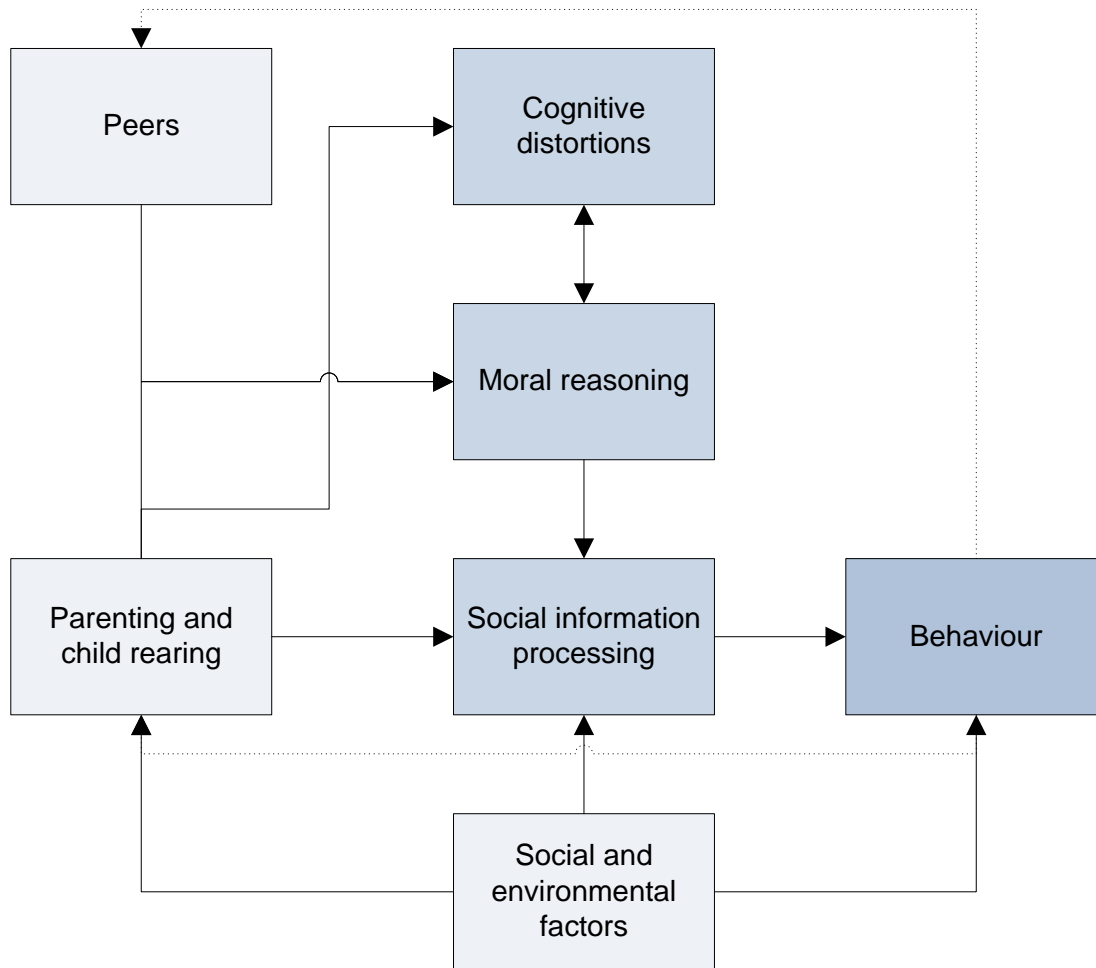
### **1.3.3 Models of Offending**

#### **1.3.3.1 Palmer's Model**

Palmer (2003) offers a multifactorial, developmental explanation of offending. It considers how a constellation of six factors come together in a dynamic model in which the outcome is criminal offending and/or antisocial behaviour. At the heart of this model is the relationship between information processing and moral reasoning. The model suggests that lower stages of moral reasoning reflect cognitive biases and errors that occur during social information processing, and these are typically seen in offenders. The model expands on the previously discussed core theories by arguing that information processing and moral reasoning are also developmentally affected by peer interaction, parenting and child rearing practices, and social and environmental risk factors. These components are detailed in Table 5, and are diagrammatically represented in Figure 2.

**Table 5. Palmer's Developmental Model of Offending**

Key Components	Description
Peer interactions	In childhood, active and spontaneous developments in reasoning are achieved with peer interactions, and passive reasoning is achieved with child-adult interactions. In young adults, moral reasoning develops through interactions with a person who is already operating at a more mature level.
Parenting and child rearing	An inductive approach towards discipline (parents give explanations as to why certain behaviours are wrong and are connected to punishment) is associated with higher levels of moral reasoning. Strong attachment between parents and their offspring is related to lower levels of antisocial behaviour in adolescents.
Social and environmental factors	Low income, high parental stress, single parenthood, an ethnic minority background, and lack of social support correlate with behavioural problems.
Moral reasoning	An individual's moral reasoning will operate at one of a number of stages, depending on the framework used, and individuals will break the law for different reasons, and in different ways, depending on their stage of moral development. Moral reasoning develops over time, and the way in which people reason about their behaviours will vary with their circumstances.
Social information processing	Individuals filter their social experiences through a complex set of social perceptions and experiences and emotions, motivations and goals.
Cognitive distortions	These are non-veridical beliefs about oneself and one's behaviour in social situations. An egocentric bias is a primary distortion that is present even in young children, and common feature among offenders, particularly when justifying their crimes. It also underlies lower level moral reasoning abilities.



**Figure 2. Palmer's Developmental Model of Offending**

(Reprinted with permission, see Appendix 2)

A single study has explored these factors using a large, age matched sample of adolescent offenders and non-offenders. Participants completed measures of moral reasoning, perceptions of parenting, and attribution of intentions of their behaviours (Palmer & Hollin, 2000). The offending group were found to have more immature sociomoral reasoning, greater perceived parental rejection, and a greater hostile attribution bias than the non-offenders, and significant relationships were noted between high perceived parental rejection, perceived parental warmth, immature sociomoral



reasoning and hostile attribution bias. Across both groups, these factors were also associated with reports of greater self-reported delinquency.

A key strength to this model is that attention is given to multiple different factors in explaining offending behaviour, and its developmental approach means it has application across the lifespan, from children with antisocial or problematic behaviours to adults engaging in criminal activity. However, the framework can be criticised. Perhaps most problematically, the model offers no theoretical rationale to link these ideas, considering them to be relatively distinct developmental processes or components. Secondly, despite offering a developmental perspective, the model does not consider the role of general intellectual functioning, which is a significant factor in explaining offending (Jolliffe & Farrington, 2004; Mears & Cochran, 2013), or consider the application to IDO, who make up a significant percentage of the offending population.

### **1.3.3.2 Arsenio and Lemerise's Model**

Lemerise and Arsenio (Arsenio & Lemerise, 2004; Lemerise & Arsenio, 2000) have developed some of the ideas in Palmer's (2003) work, providing support for the idea that social information processing perspectives and moral reasoning are integrally linked. In essence, they suggest that the way social behaviours or motivations are understood and interpreted has a fundamental role in the enactment of an individual's behaviour. Using the social information processing model (Crick & Dodge, 1994) which asserts that real time processing of information and decision making is made in the context of social situations, Arsenio and Lemerise note that affective information, such as that of the facial expression of another person, is a vital source of information to be encoded and interpreted.

They suggest that this is filtered through latent mental structures (knowledge, schemas, and social rules), which form the core of a framework that organise

information about oneself, together with access to social and moral conventions that are used to inform their social interactions. Behaviour therefore stems from attempts to understand social information using moral (e.g. involve issues of fairness and justice) and non-moral (e.g. rules information typically governs emotional interactions) knowledge bases. The selection of a goal or information that is attended to will then vary according the information and knowledge set, and so can exert different influences on response generation, evaluation, and decision.

### **1.3.3.3 Garrigan and Langdon's Model**

Recently, this work has been developed further by Garrigan and Langdon (In Press), specifically in relation to people with ID. From the perspective that cognitive and socio-moral ideas develop and mature over time, the authors integrate theories of empathy and affect in order to consider the how role of perspective taking, emotional regulation and empathic arousal, relates to moral decision making and social information processing, and thereby influences behaviour. They also incorporate developmental neuroscience theories to consider how factors such as attention, working memory and abstract thinking contribute to this process. A diagrammatic summary of the model is shown in Figure 3.

Their model contains the six non-sequential steps drawn from Crick and Dodge's (1994) model. Core developmental changes are depicted within the four components of the inner circle (brain development, emotion processes, database and social factors), and together, they mature with development (see Table 6). The brain development aspect of this model is intrinsic to development of all cognitive and emotional skills. The maturation of the connections and regions influences the nature and speed at which

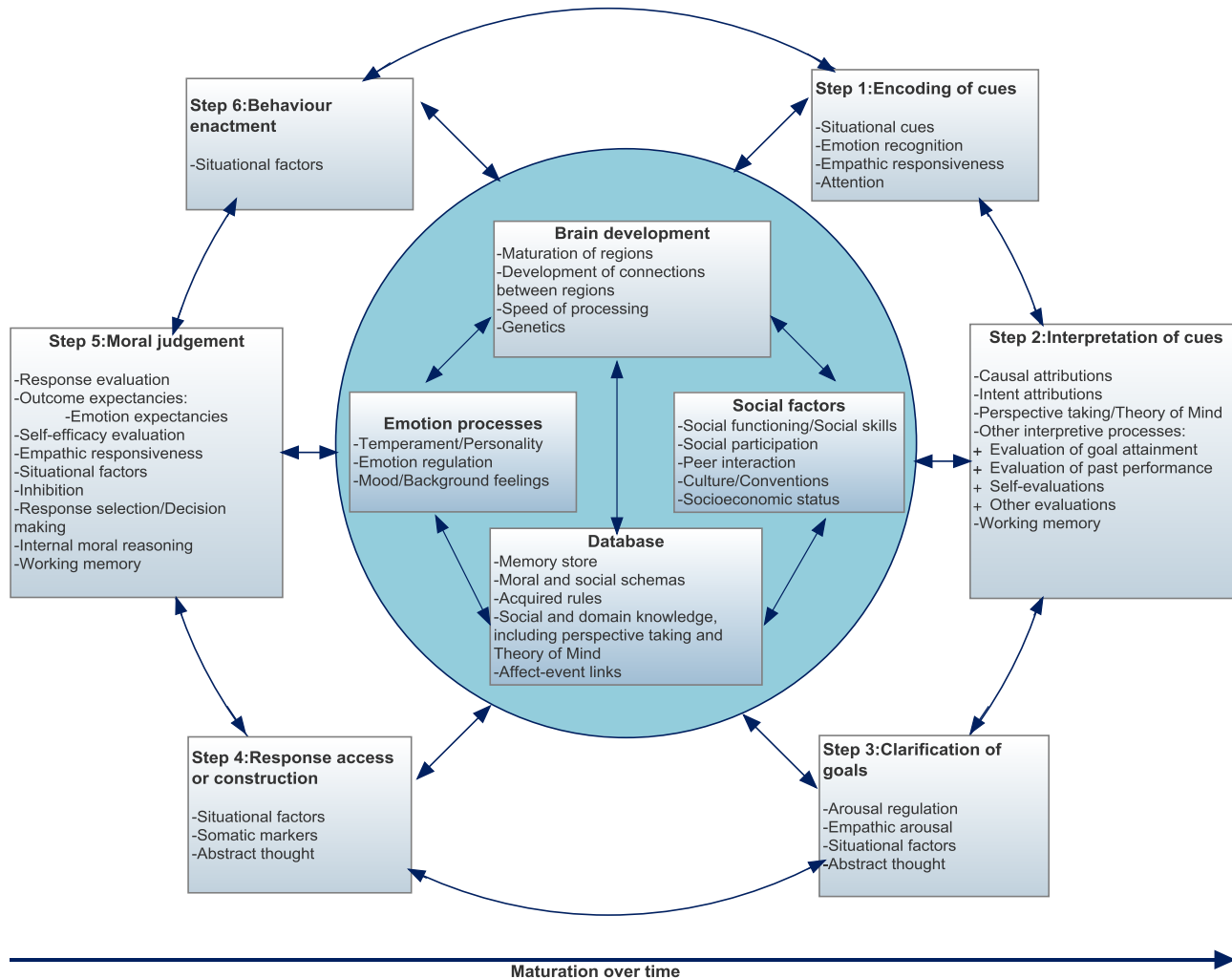


Figure 3. Garrigan and Langdon's (In Press) Developmental Model of Offending.

**Table 6. Garrigan and Langdon's (In Press) Developmental Model of Offending**

Step	Description
1. Encoding of cues	Selective attention e.g. to a moral dilemma, which develops with age. Only cues that are attended to can be interpreted.
2. Interpretation of cues	Interpretation involves making inferences about the perspectives and intentions of others, which changes as the brain develops, and its capacity for perspective taking, develops. Interpretation of cues also relies on evaluations of the self, other and the past, which requires working memory capacity.
3. Clarification of goals	Moral goals are long term structures which individuals endeavour to live by, and are developed through communication and interaction with others. Orientation and desire to achieve such outcomes that may not have previously been experienced or achieved relies on abstract thinking. In addition, appropriate emotional arousal, and the ability to regulate this, is needed in order to achieve a proportionate response to stimuli.
4. Response access or construction	Emotional, in addition to cognitive processes, are used to assess the incentive value of available choices. Associations are made between reinforcing stimuli and positive physiological affective states. Responses generated that lead to a negative "gut feeling" are filtered out.
5. Moral judgement	A more deliberate reasoning process is required in order to confirm reformulate or discard a moral judgement accessed or constructed at step 4. This is influenced by relevant moral schema - relevant rules and knowledge. A cognitive evaluation of emotional expectations and memory of previous experiences also contributes to responsiveness.
6. Behavioural enactment	The enactment of behaviour. However, this can be overridden, e.g. due to a sudden conflicting emotion, or a realisation that the self-efficacy has been overestimated.

information is processed, and the content and way in which schemas are stored.

Examples of regions implicated in this model include the amygdala, which is proposed to play a role in emotion (Davis & Whalen, 2001), and the pre-frontal cortex, which is involved in abstract thinking (Yurgelun-Todd, 2007), however the authors acknowledge a number of areas and connections are likely to be implicated in this process.

The database component of the model places emphasis on morality within decision-making. It comprises information stored in memory, rules and knowledge, and is influenced by brain development, such as memory capacity and executive functioning skills. The model also considers the importance of emotion and experience (Hoffman, 2000). Empathy and emotion based processes emphasise the importance of temperament, the physiological state associated with emotions, and affect regulation, suggesting these influence the aspects of a situation that are captured by attention and will therefore influence the interpretation of the situation (Damasio, 1994; Lemerise & Arsenio, 2000). In addition, social, cultural and economic variables will affect development and thereby affect processing and influence the information stored in schema.

In typically developing individuals, a young child has limited cues and experiences on which to base moral decisions. However, these skills become more efficient and elaborate with maturity and increasing experiences, as a result of developments in encoding, storage, and retrieval processes within the brain. In atypical development, however, Garrigan and Langdon suggest that neural damage or impairment may impact upon the interrelated cognitive, social, moral emotional processes, as these functions are carried out in multiple regions and connections throughout the brain. Consequently, damage, impairment, or delay will impair this

developmental trajectory. For example, people with attention deficits will not encode as many features of a situation as someone with typically developing attention, or people with deficits in emotion recognition may have impaired abilities to encode emotional cues seen in by others, and may have difficulty interpreting these cues. Consequently, such deficits can impact upon the way in which information is processed during the process of making a moral decision, and so this model offers a comprehensive consideration of where, and how, deficits may arise, and thus problematic behaviour may result.

#### 1.3.3.3.1 *Application to IDO*

Garrigan and Langdon's (In Press) model suggests that impairments in one or more components of this process can have significant implications for behaviour, and consequently, the model has application to IDO. It can be hypothesised that, as a consequence of brain damage or delay, people with an ID will have impairments in social information processing, perspective taking, and/or empathy that may contribute to a delay in their moral development, and together with pertinent socio-economic factors, this can lead to antisocial behaviour. For example, attentional deficits that impact on the ability to encode information, difficulties with perspective taking that bias the interpretation of interpersonally-based cues, or impaired abstract thinking skills that prevent people from working towards long term, moral-based goals, may develop or maintain offending behaviour.

A review of the limited moral development studies in this area suggests that when comparing people with ID to chronologically age matched peers, moral reasoning is significantly related to cognitive ability (Langdon, Clare, et al., 2010). However, only one study has explored how this might relate to empathy and cognitive processes in IDO. In a four-group design comparing people with ID, IDO, non-ID offenders and

non-ID non-offenders, Langdon, Murphy, Clare, Steverson & Palmer (2011) reported that the ID groups had less developed moral reasoning and empathy than the non-ID groups, but that they had a greater level of cognitive distortions than the non-ID groups. Also, the IDO group had the highest levels of cognitive distortions, and significantly more developed moral reasoning than ID non-offenders. The authors suggest these findings indicate that high levels of cognitive distortions are the first step in a relationship with empathy, that is mediated by moral reasoning, and culminates in offending behaviour (Gibbs, 2003; Hoffman, 2000). Whilst further work is needed at all aspects of the model to confirm these interpretations, this preliminary investigation suggests that the relationship between cognitive, emotional and moral processes may offer a useful framework for understanding offending in this population.

#### **1.3.4 Section Summary**

This section has reviewed moral, empathy and information processing theories in some detail, and has considered how they can explain general offending behaviour within the population. However, in isolation these are insufficient, and more comprehensive models, such as that by Palmer (2003) and by Arsenio and Lemerise (2004) gives consideration to how these factors interact, and are influenced by development, in order to produce behaviours. The recent development of a model that considers all of these factors, and specifically relates this to development, may offer the most up to date understanding of offending in people with ID. Garrigan and Langdon's (In Press) model suggests that the way in which information is processed is directly related to emotional and social factors, and stored information from previous experiences, all of which is integrally linked to brain development and function. With this as a backdrop, the final section in this chapter will explore a single aspect of this process in detail, in preparation for the current study.

## **1.4 Attentional Bias**

### **1.4.1 Section Overview**

At the core of the models discussed in section 1.3.3 is information processing, and social-cognitive theorists argue this is vital to how a person interacts with the world. The first step comprises the way in which attention is allocated, which is necessary for the cognitive load of a vast array of environmental information to be managed efficiently. The concept of attentional bias will first be discussed, describing this cognitive phenomena and how it can be measured. This will then be considered in relation to empathy, a key aspect of models of offending. A literature review will then consider how attentional bias has been investigated in offenders, and studies looking at attentional bias in people with ID will be examined.

### **1.4.2 Attentional Bias**

In all aspects of life, we use visual information to guide our behaviour. However, given the vast array of information available to us, we need to select the information that is most relevant to our current goals, and the cognitive process of attention enables some information to be prioritised over others. Attention can broadly be understood as the process by which external stimuli form internal representations that gain conscious awareness, and it comprises three processes: disengaging attentional focus from one location, shifting attention to a new location, and engaging attention in the new location (Posner, Inhoff, Friedrich, & Cohen, 1987; Posner, Snyder, & Davidson, 1980). Where information is processed through a “top-down” approach, attention is under the intentional volition of the individual. In “bottom-up” processing, attention is guided by the salient features of the stimulus in the environment, in a more passive, automatic way. These processes do not necessarily favour the same stimulus, and one can prevail over the other e.g. if attention is involuntarily drawn to salient stimuli, the selection of stimuli



that are in line with current goals can be delayed, or both processes can occur simultaneously.

Attention is the mechanism by which salient stimuli are detected, appraised in terms of their significance, and then acted upon through cognitions and behaviours (Broadbent, 1958; Öhman, 1993). Consequently, it is not uniformly biased towards certain types of stimuli (Fox, Ridgewell, & Ashwin, 2009); it has been suggested that highly salient or emotive information is most likely to influence attention. One perspective on attention, the categorical negativity theory, suggests that only stimuli that is initially perceived as negative, attracts attention (Pratto & John, 1991). Whilst there is some support for this idea (e.g. Sharma & McKenna, 2001), there is also evidence to suggest that positive information influences attention (Dalglish, 1995; Koven, Heller, Banich, & Miller, 2003). An alternative perspective, the cognitive resource allocation model (Kahneman, 1973) hypothesises that that the more interested a person is in a particular type of stimuli, the more cognitive resources they will devote to viewing that stimulus, and as such, the more attention it demands.

The psychopathology literature offers the clearest demonstration of the importance of this single aspect of information processing. A substantial body of evidence demonstrates that individuals with disorders of affect are prone to biased processing of stimuli which are emotionally salient to the key traits, or concerns, of their disorder (Mogg & Bradley, 1999; J. Williams, Watts, MacLeod, & Mathew, 1997). In people with anxiety, attentional processes are biased towards threat stimuli, whilst people with depression preferentially attend to negative information (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van, 2007; Dalglish & Watts, 1990; MacLeod, Mathews, & Tata, 1986). As such, the allocation of attention is central to cognitive explanations of

aetiology and maintenance of the mental health problems (Beck, Rush, Shaw, & Emery, 1979; Mogg & Bradley, 1999).

Research into attentional bias is stimulated by the prospect that improving understanding will lead to the development of new and more effective therapeutic interventions (Mobini & Grant, 2007). Ideas regarding attentional bias have been applied to psychological therapy, where more adaptive, unbiased information processing is encouraged through increased awareness and implementation of cognitive restructuring (e.g. Beck et al., 1979; Wells, 1997). This is of particular utility in cognitive-behavioural therapy, where emphasis is placed on aiding individuals to notice their attentional biases, and subsequently learn how to reallocate their attention (Wells, 1997). There is also interesting and promising research into cognitive and attentional bias modification interventions, which aim to modify cognitive biases through repeated practice on cognitive tasks (Bar-Heim, 2010).

#### **1.4.2.1 Assessment**

Assessment of attentional bias is based on the premise that attention can be measured by assessing the speed of responses made to visual probes, and a number of paradigms exist that capture the allocation of attention in different ways. For example, the emotional Stroop task involves naming the colour ink that a variety of emotional words are written in. The speed of the response or reaction times (RT) are used as evidence of an attentional bias; in this task, slow RT indicate that attention to the meaning of the word interferes with the task performance, whilst the presence of emotion words in a lexical decision task is thought to facilitate performance. Participants are asked to focus on the meaning of a string of letters, and to indicate whether these form a word or a non-word. In this task, faster RT occur when the word is of emotional or motivational significance.

The dot-probe task is another established attentional bias assessment (Williams et al., 1997), and can be adapted to suit the population under investigation (Mogg & Bradley, 1999). Using either lexical or pictorial stimuli, it typically involves the brief presentation of two images, one that is of interest or significance, and one that is neutral. A dot-probe then immediately follows this, appearing behind the location of either image, and participants are required to press a button to indicate the position of the probe. The content of the stimuli and length of stimuli exposure can be varied considerably, depending on the hypotheses under investigation (e.g. Bradley, Mogg, White, Groom, & de Bono, 1999).

In tasks such as the Stroop and dot-probe, fast response times have typically been interpreted to indicate hypervigilance or facilitated orientation of attention towards the stimuli in question. However, an increasing body of literature suggests this may be equally due to the stimulus holding attention, or a difficulty with disengagement (Fox, Russo, Bowles, & Dutton, 2001; Koster, Crombez, Verschuere, & De Houwer, 2004; Yiend & Mathews, 2001). In order to determine the nature of this bias in the dot-probe, RT to salient image trials can be compared to trials containing only neutral images, which do not elicit an attentional bias. Interpretation of the data relies on the assumption that faster responses will occur when the trial is congruent (i.e. when the probe appears behind the salient image) than when trial is incongruent (i.e. when the probe appears behind the neutral image), as attention is already allocated to the visual field where the probe has appeared. Faster responses to congruent salient image trials than neutral trials is thought to reflect vigilance for the stimuli, as content of the image is thought to have captured the individuals attention (Koster et al., 2004). Conversely, difficulties with disengagement are thought to be indicated by slower responses to incongruent negative trials, in comparison to neutral trials, as this indicates the individual has difficulty

disengaging and shifting their attention from the image in order to respond to a probe in a different location.

The characteristics of the attentional bias are also commonly investigated by converting RT data to an attentional bias index that indicates the attention capturing quality of the stimulus (Gotlib, Krasnoperova, Yue, & Joormann, 2004). Using a standardised calculation that considers the position of the dot-probe in relation to the stimuli of interest (congruency), comparisons are made between RT to congruent and incongruent trial types using the same type of affective image, giving a proxy measure of whether the attention is drawn towards, or away from, the image.

Despite their widespread use, some authors have questioned the reliability and validity of measures such as the dot-probe, and overall, there is a paucity of psychometric data on these measures (Cisler, Bacon, & Williams, 2009). What little test-retest reliability and internal consistency evidence is available is inconsistent (Eide, Kemp, Silberstein, Nathan, & Stough, 2002; Schmukle, 2005; Siegrist, 1997), and this is compounded by the fact that the nature of the measure means it is not standardised. In addition, studies have also shown that scores on different measures do not always correlate when used within the same sample (Egloff & Hock, 2003). To further complicate the picture, there is also evidence that attentional bias alters with other factors, such as age (e.g. Carstensen, Pasupathi, Mayr, & Nesselroade, 2000; Mather & Knight, 2005), sex (Tan, Ma, Gao, Wu, & Fang, 2011; Vitale, 2011), and race (Lorenz & Newman, 2002b). Despite this, these tasks are widely used as it is argued that meaningful conclusions can be drawn from the data (Cisler et al., 2009).

Physiological measurements can also be used in order to determine how attention varies with different types of stimuli. For example, event related potential modulation, a measure of neural response as a direct result of a specific cognitive event, is often used

to measure information processing (e.g. Anderson & Stanford, 2012). In sex offenders, penile plethysmography can be used to measure arousal in response to stimuli (Reyes, Vollmer, & Sloman, 2006), and electrodermal skin conductance can be used with a wider range of participants (Fung et al., 2005). Also, eye tracking studies offer a robust form of measuring the way in which attention is allocated, and can conclusively indicate whether certain stimuli types attract or maintain attention (Nummenmaa, Hyönä, & Calvo, 2006; Wadlinger & Isaacowitz, 2006).

### **1.4.3 Attentional Bias and Empathy**

Empathy researchers have long sought to understand the mechanisms by which we come to feel the emotional states of others. In section 1.3.2, it was discussed that the perception-action model of empathy posits that we attend to affect-laden information, we recognise and comprehend it quickly, this activates our own internal representations, and so this is felt as if it is our own (Preston, 2007). This resonates with descriptions of cognitive empathy; the ability to place one's own needs in the context of others' enables a person to understand another's perspective in a conflict situation, and stands in contrast to those who have a self-serving or egocentric (and therefore distorted) cognitive style (Feshbach, 1975). Thus, recognising and attending to emotional information is central to this process. Studies of social referencing suggest that an awareness of, search for, and use of affect-based information starts early in development. Evidence suggests that infants access emotional information displayed in adult facial expressions, which they then use to guide their behaviour, such as their interactions with strangers (Feinman & Lewis, 1983).

As the cognitive functions of attention and encoding develop, attention may be allocated to new and less obvious sources of information, certain stimuli become favoured or more salient, and a preference is typically developed for visual stimuli over

other sensory modalities (Blanck, Rosenthal, Snodgrass, DePaulo, & Zuckerman, 1982), particularly where multiple cues offer discrepant information. This attention to affective stimuli in the environment, such as facial expressions or non-verbal cues, theoretically forms the basis upon which an assumption can be made about what another person is thinking or feeling, i.e. cognitive perspective taking or cognitive empathy.

Up until recently, it has not been possible to go beyond theoretical explanations of the relationship between attention and encoding of affective information, and empathy. However, there is now a small amount of research in non-clinical populations that considers this process. Using an “Emostroop” task (that measures RT to emotion words superimposed over task-irrelevant pictures – congruent or incongruent faces in relation to the word), Preston and Stansfield (2008) found that individuals who rated highest for emotional contagion (the mimicry and synchronisation of emotion with others) for anger and fear, were less distracted by happy faces. They suggest that those who strongly relate to negative emotions may experience more negative affect, or are more likely to perceive it in others, offering evidence for the role of empathy in top-down processing, as they are less likely to experience interference by positive emotions. They also found that RT data were consistently slower to angry words in comparison to happy words. They suggest this is because anger is associated with a set of inherent, conditioned social responses, and so may be affiliated a goal of avoiding exacerbation of a situation, thus having a suppressive effect on behaviour

A recent follow up study sought to understand how individual differences in self-reported empathy are related to differences in attention to affective stimuli. Using the same task, Hofelich and Preston (2012) replicated Preston and Stansfield’s (2008) findings. They also reported that trait empathy and facial mimicry, measured using facial electromyography, resulted from differences in attention. Participants typically

mimicked the face they were attending to, and this mimicry was higher in people with high levels of empathy. Furthermore, people with high empathy had significantly slower RT to positive and negative words than neutral words, suggesting increasing processing of this information. For these individuals, the authors argue this could be particularly beneficial if they are in circumstances where correctly determining affect is difficult or complex. The authors suggest that further research is needed in order to examine how people monitor their environment and allocate their attention, and to consider the role these processes play in a prosocial actions and responses.

Neural studies of attention have also found a relationship between attention to affective information and empathy. Choi and Watanuki (2014) measured participants' event-related potentials whilst they completed a stimuli discrimination task, and found that those with highest self-rated empathy scores paid more attention to facial expressions than neutral stimuli, and that this correlated with a greater amplitude in 'late positive potential' neural signals, which are commonly seen in relation to arousing or motivationally significant stimuli. They suggest this is because people with higher levels of empathy are more likely to work to gauge the emotional states and intentions of others.

#### **1.4.4 Attentional Bias and Offending**

As discussed in section 1.3.2, the activation of certain schema is associated with distortions, which in turn, are associated with changes in affect, motivation and behaviour. Furthermore, drawing upon the theory and evidence from the general population, it appears that individual levels of empathic skills are related to the way in which people process external information. Thus, although attentional bias has largely been investigated in clinical and non-clinical populations, it has the potential to explain a key cause and maintenance aspect of offending behaviour. There is currently some

evidence for this type of investigation. For example, using an emotional picture dot-probe task with distressing and threatening stimuli, Kimonis, Frick, Fazekas, and Loney (2006) found that adolescents with callous-unemotional traits had reduced attention to distressing pictures, suggesting that cues that should typically inhibit aggressive behaviour (such as victim distress cues) are ineffective in this population. They also conducted a similar study with a more ethnically diverse population (Kimonis, Frick, Munoz, & Aucoin, 2008), although processing of stimuli related to callous-unemotional traits was not observed.

However, it is not immediately clear which types of information may be perceived as salient to offenders. Similar to “disorder specific” stimuli seen in affective disorders (Mobini & Grant, 2007), information that is related to the type of crime the offender commits may be salient, because the individual holds offence-related schema or cognitive representations (Smith & Waterman, 2003). Alternatively, given evidence suggesting impairments in empathy and affective processes (e.g. Hogan, 1969), this may suggest that emotional or affective stimuli are of particular relevance to offenders.

#### **1.4.4.1 Literature Review**

To better understand the phenomenon of attentional bias in this population – that is, whether a particular type of stimuli elicits an attentional bias, and whether offenders are particularly fast or slow to attend to this – a systematic literature review of non-ID offenders was conducted. Full criteria for study inclusion is outlined in Appendix 3, but it should be noted that in order to see if offenders had an attentional bias for certain types of stimuli, methodologies in the included studies had to make use of salient stimuli (rather than generic stimuli e.g. colours) stimuli, defined as either affective or offence-related stimuli.



Abstracts of relevant articles were initially searched in order to determine appropriate search terms; the terms used are detailed in Appendix 4. The selection and exclusion criteria and processes are detailed in Appendix 5. The primary searches were conducted using NHS Evidence and Web of Knowledge, and PubMed was used to find studies which had not yet been indexed through Medline. Two searches were performed, covering the inception of each journal searched through to March 2014. Articles were retrieved if they were considered to be potentially relevant on the basis of the abstract, or if the abstract gave insufficient information for a judgement to be made. This process resulted in a total of 16 eligible papers. In order to understand the nature of any attentional bias observed, the studies were grouped according to significant differences observed between groups. Results from the review are shown in Table 7.

#### 1.4.4.1.1 *Attentional Bias: Faster*

In two studies, offenders were found to have faster RT to stimuli than their control group. Using both the dot-probe task and the Stroop task, violent offenders (VO) attended faster than non-offenders (NO) to aggression stimuli, relative to neutral stimuli (Smith & Waterman, 2003). Lorenz and Newman (2002c) reported that antisocial personality disordered offenders attended significantly faster to affective stimuli (relative to neutral stimuli), than non-antisocial personality disordered offenders. When looking at results by gender, the same pattern of results was also found in females only, but not in males only.

#### 1.4.4.1.2 *Attentional Bias: Slower*

In total, eight studies found offenders had a slowed attentional bias in comparison to their control group. Two of these demonstrated slower RT in comparison to NO. Both VO and sex offenders (SO) were slower to colour name sexual words when

**Table 7. Systematic Literature Review of Attentional Bias Studies in Offenders**

Study	Sample	Experimental paradigm	Results
<i>Faster RT</i>			
Smith and Waterman (2003)	<sup>a</sup> 38 VO, 12 NVO; 30 NO <sup>b</sup> Males and females <sup>c</sup> Prisons; university students (UK) <sup>d</sup> Caucasian	<sup>f</sup> Dot-probe, Stroop <sup>g</sup> Affective words	Dot-probe: VO had faster RT than NO ( $p < .05$ ), when probes replaced aggression words relative to neutral words. Stroop: VO had faster RT than NO ( $p < .05$ ), when colour-naming aggression words relative to neutral words.
Lorenz and Newman (2002c)	<sup>a</sup> 197 APDO; 194 NAPDO <sup>b</sup> Males and females <sup>c</sup> Prisons (USA) <sup>d</sup> African American and Caucasian	<sup>f</sup> Lexical decision <sup>g</sup> Affective words	APDO had faster RT to affective words, relative to neutral words, than NAPDO ( $p < .01$ ). These findings were also observed in females only, but not males only.
<i>Slower RT</i>			
Smith and Waterman (2004a)	<sup>a</sup> 38 VO, 12 NVO; 30 NO <sup>b</sup> Males and females <sup>c</sup> Prisons; university students (UK) <sup>d</sup> Caucasian	<sup>f</sup> Primed dot-probe, Visual search <sup>g</sup> Affective words	Dot-probe: VO had slower RT to probes after reading violent text, than after reading neutral text ( $p < .00$ ), compared to NO. Visual search: VO had slower RT for detecting neutral words, when surrounded by aggression words ( $p < .01$ ), compared to NO.
Smith and Waterman (2004b)	<sup>a</sup> 10 SO, 10 VO, 10 NVO; 13 NO <sup>b</sup> Males <sup>c</sup> Prisons; university students (UK) <sup>d</sup> Caucasian	<sup>f</sup> Stroop <sup>g</sup> Affective words	SO and VO were slower to colour name sexual words than NO ( $p < .05$ ).

Mokros, Dombert, Osterheider, Zappala, and Santtila (2010)	<sup>a</sup> 21 CMO, 21 NSO <sup>b</sup> Males <sup>c</sup> Forensic psychiatric hospital (Germany) <sup>d</sup> Unspecified	<sup>f</sup> Choice reaction time <sup>g</sup> Offence-related pictures	CMO were slower to respond to pictures of infants than adults, and NSO had slower RT to pictures of adults than children ( $p = .01$ ).
Williamson, Harpur, and Hare (1991)	<sup>a</sup> 8 PO, 8 NPO <sup>b</sup> Males <sup>c</sup> Prisons (Canada) <sup>d</sup> Unspecified <sup>e</sup> >33; <25	<sup>f</sup> Lexical decision <sup>g</sup> Affective words	PO had slower RT on lexical decisions that used affective words, compared to neutral words, than did NPO (statistical significance not reported).
Lorenz and Newman (2002a)	<sup>a</sup> 11 LA and 17 HA PO, 26 LA and 20 HA NPO <sup>b</sup> Males <sup>c</sup> Prisons (USA) <sup>d</sup> Caucasian <sup>e</sup> >30; <20	<sup>f</sup> Lexical decision <sup>g</sup> Affective words	LA PO had slower RT to affective stimuli, relative to neutral stimuli, than LA NPO, when indicating lexical decisions with their right hand ( $p < .001$ ).
Kosson, Lorenz and Newman (2006)	<sup>a</sup> 25APDO-PO; 26 APDO-NPO; 36 NAPDO <sup>b</sup> Males <sup>c</sup> Prison (America) <sup>d</sup> Caucasian	<sup>f</sup> Lexical decision <sup>g</sup> Affective words	APDO-PO had slower RT for affective stimuli, relative to neutral stimuli than APDO ( $p < .05$ ).
Domes, Mense, Vohs and Habermeyer (2013)	<sup>a</sup> 35 APDO; 34 NAPDO ; 24 NO <sup>b</sup> Males <sup>c</sup> Prisons and forensic psychiatric hospital; community (Germany) <sup>d</sup> Caucasian	<sup>f</sup> Stroop <sup>g</sup> Affective words	APDO had significantly slower RT than NO when colour naming negative and violent words, relative to neutral words ( $p < .00$ ).

---

Price, Beech, Mitchell and Humphreys (2013)	<sup>a</sup> 28 SO; 21 VO; 38 NO <sup>b</sup> Males <sup>c</sup> Prison and probation; university sample (UK) <sup>d</sup> Caucasian	<sup>f</sup> Stroop <sup>g</sup> Affective words; Deviant sexual interest words	SO had significantly slower RT to negative words than VO and NO ( $p < .05$ ). SO had significantly slower RT to emotional-personality, sexual action and physical descriptor words, than VO and NO ( $p < .05$ ).
<i>No observed differences</i>			
Ó Ciardha and Gormley (2012)	<sup>a</sup> 24 SO; 24 NO <sup>b</sup> Males <sup>c</sup> Community treatment/prisons; university students (UK) <sup>d</sup> Unspecified	<sup>f</sup> Stroop <sup>g</sup> Offence-related pictures	No significant differences in RT between SO and NO to stimuli (ns).
Price and Hanson (2007)	<sup>a</sup> 15 RO, 15 CMO, 15 VO, 15 NVNSO; 15 NO <sup>b</sup> Males <sup>c</sup> Prisons; community sample (Canada) <sup>d</sup> Caucasian	<sup>f</sup> Stroop <sup>g</sup> Offence-related words	No significant difference in RT between all SO, and NSO, when colour-naming sexual words (ns).
Muller et al. (2008)	<sup>a</sup> 10 PO; 12 NPNO <sup>b</sup> Males <sup>c</sup> Forensic hospital; unspecified (Germany) <sup>d</sup> Caucasian <sup>e</sup> >28; <10	<sup>f</sup> Simon paradigm <sup>g</sup> Affective pictures	No significant group differences in RT for spatial response, for different affective stimuli (ns).

---

Lorenz and Newman (2002b)	<sup>a</sup> 14 LA and 9 HA PO, 16 LA and 23 HA NPO <sup>b</sup> Males <sup>c</sup> Prisons (USA) <sup>d</sup> Africa American <sup>e</sup> >30; <20	<sup>f</sup> Lexical decision <sup>g</sup> Affective words	No differences between psychopathy groups, or psychopathy-anxiety groups, for valence or hand used for response (ns).
Vitale (2011)	<sup>a</sup> 10 LA and 15 HA PO, 20 LA and 16 HA NPO <sup>b</sup> Females <sup>c</sup> Prisons (USA) <sup>d</sup> Caucasian <sup>e</sup> >24; <14	<sup>f</sup> Lexical decision <sup>g</sup> Affective words	No differences between psychopathy groups, or psychopathy-anxiety groups, for valence or hand used for response (ns).
Cima, Tonnaer, and Lobbestael (2007)	<sup>a</sup> 55 offenders <sup>b</sup> Males <sup>c</sup> Prisons (Netherlands) <sup>d</sup> Caucasian	<sup>f</sup> Implicit Association Task <sup>g</sup> Affective words	No difference in RT to probes for neutral and moral stimuli (ns).
Kosson, Lorenz and Newman (2006)	Reported under “Slower RT”		There were no differences between APDO and NAPDO (on a lexical decision task).
Domes, Mense, Vohs and Habermeyer (2013)	Reported under “Slower RT”		There were no significant differences between APDO and NAPDO (on a Stroop task).

*Note:*

- <sup>a</sup> Demographics
- <sup>b</sup> Gender
- <sup>c</sup> Recruitment (Country)
- <sup>d</sup> Ethnicity
- <sup>e</sup> Cut-off scores on the PCL-R (Psychopathy Checklist Revised) used to determine groups
- <sup>f</sup> Task
- <sup>g</sup> Stimulus

RT = Reaction times  
VO = Violent offenders  
NVO = Non-violent offenders  
NO = Non-offenders  
SO = Sex offenders  
NSO = Non-sex offenders  
RO = Rapist offenders  
CMO = Child molesters offenders  
NVNSO = Non-violent non-sex offenders  
PO = Psychopathic offenders  
NPO = Non-psychopathic offenders  
NPNO = Non-psychopathic non-offenders  
LA = Low anxious  
HA = High anxious  
APDO = Antisocial personality disordered offenders  
NAPDO = Non-antisocial personality disordered offenders

surrounded by aggression words on the Stroop task (Smith & Waterman, 2004a) VO had slower RT to dot-probes after reading violent text, than after reading neutral text, and slower RT for detecting neutral words, on a primed dot-probe and visual search tasks (Smith & Waterman, 2004b).

Four studies found the offender group of interest had slower RT than a “control” offender group; that is, a group of offenders that were unlikely to have a bias for the stimuli under investigation. Mokros, Dombert, Osterheider, Zappala, and Santtila (2010) used a Choice Reaction Time task with SO, and found that offence-related stimuli are salient to the attention offenders; child molesters had slower RT to infant stimuli than adults, whilst non-SO had slower RT for adult stimuli. Williamson, Harpur and Hare (1991) investigated the processing of affective words by psychopathic offenders (PO), and reported PO had slower RT to affective words than non-PO (NPO). Similarly, Lorenz and Newman (2002a) reported that when participants gave right handed responses, low anxiety PO had slower RT to affective stimuli, relative to neutral stimuli, than low anxiety non-PO. Finally, Kosson, Lorenz and Newman (2006) found that offenders with diagnoses of antisocial personality disorder and psychopathy, had slower RT (that is, less attentional facilitation for affective stimuli) than two other offender groups (those with a diagnosis of antisocial personality disorder and without psychopathy, and those neither antisocial personality disorder, nor psychopathy).

Two studies compared their offender group of interest to control offenders and control non-offenders. Using the Stroop task and sets of affective words, both Domes, Mense, Vohs and Habermeyer (2013) and Price, Beech, Mitchell and Humphrey (2013) found that both offenders with antisocial personality disorder and SO respectively were slow to colour name both affective and sexual lexical stimuli, both in comparison to

non-offender controls, and in comparison to offenders with no diagnosis of antisocial personality disorder, and VO.

#### 1.4.4.1.3 *Attentional Bias: No Observed Differences*

Six studies reported no significant differences in attentional bias. Price and Hanson (2007) and Ó Ciardha and Gormley (2012) found that SO had similar information processing of offence stimuli to non-SO on the Stroop task. In three studies, no differences in attentional bias were observed between PO and non-psychotic NO (Muller et al., 2008); male non-PO (Lorenz & Newman, 2002b), or female non-PO. In the only study to use a single group design, and to consider the broad category of “offenders”, Cima et al. (2007) found no differences in attentional bias when comparing attention to moral versus neutral stimuli. In addition, the previous studies by Kosson et al. (2006) and Domes et al (2013) also reported no differences when comparing offenders with and without antisocial personality disorder on lexical and Stroop tasks, respectively.

#### 1.4.4.1.4 *Summary of Findings and Methodological Considerations*

Overall, investigations of attentional bias in offenders revealed that over half of the published studies indicated an attentional bias for salient information, with the majority using affective rather than offence specific stimuli. Eight studies found that offenders had slower RT to salient stimuli, whilst two studies found that RT were faster for salient stimuli. However, six studies reported no significant differences in the way attention was allocated, and two of the studies that had reported slower RT also reported no differences between groups. Broadly, there is therefore some evidence to suggest an attentional bias exists in offenders; it does not appear to be as robust a phenomenon in this population as it is in people with mental health problems such as anxiety.



Furthermore, no attentional bias trends were evident for different stimuli types, or within each offender sub-group; at best, both studies of VO found an attentional bias.

However, the nature of the studies reported makes it difficult to draw conclusions from the data, which leads to a necessary consideration of the methodological differences between studies. Firstly, the way in which data was reported varied considerably across studies; some authors reported their data in the form of an attentional bias index, which denotes the attention-mediated speed of response to images depending on whether or not the probe is congruent with affective image, whilst others directly compared RT between groups. Without both types of data being reported, this makes it difficult to go beyond statements that describe the presence or absence of a general attentional bias.

Secondly, across all of these studies, participants were relatively heterogeneous in terms of country of origin, gender and race, and it is likely that more reliable conclusions could be drawn from more homogenous populations. Thirdly, a number of design problems occurred throughout the studies. Sample characteristics were often inadequately reported or analysed, making it difficult to know whether confounding variables were adequately controlled, or if groups were appropriately matched (e.g. Muller et al, 2008). Inclusion criteria were not always appropriate to the study; for example, several studies did not examine IQ or reading level, despite the fact that often both were intrinsic to completion of the experimental task (e.g. Smith and Waterman, 2004b). Furthermore, comparison groups were a mixture of offenders and non-offenders, which makes drawing reliable conclusions across the data problematic.

Fourthly, a mixture of tasks and stimuli were used; some of the stimuli were highly salient to the offender group, whilst others were more generic. As none of the studies compared the two stimuli types within the same study, it is not possible to know

whether this had an effect on the findings. There was also a mix of pictorial and lexical stimuli, which have influenced the findings. It is also worth considering that a possible explanation for non-significant findings is that the stimuli used do not reflect differences in accessible schema specific to the offence type of each group (e.g. Cima et al, 2007). Furthermore, many studies drew their conclusions from using neutral stimuli and only one type of affective stimuli (e.g. Williamson, Harpur and Hare, 1991), which does not take into account the potential role that other factors may have, such as the level of arousal elicited by the affective stimulus (Kahneman, 1973).

#### **1.4.4.2 Attentional Bias in ID and IDO**

To date, attentional bias in people with ID, and IDO, has received extremely limited attention. Only three published studies have specifically examined attentional bias in people with ID, two of which were in people with Williams Syndrome. Using a dot-probe task and stimuli of different emotional valence facial expressions, it was found that people with Williams Syndrome had a greater attentional bias for happy faces, in comparison to chronological and mental age matched groups (Dodd & Porter, 2010), and had an attentional bias towards threatening images (Dodd & Porter, 2011). The third considered people with alcohol related problems (van Duijvenbode, Didden, Voogd, Korzilius, & Engels, 2012). Grouping participants according to three categories each of IQ, and alcohol consumption, no differences were observed between groups on severity of alcohol use or ID. However, given the number of groups in the sample and the overall sample size ( $n = 57$ ), this may have contributed to the null findings.

Finally, one unpublished preliminary investigation of attentional bias has been conducted in offenders with ID using offence-related stimuli. Watson (2006) compared ID child sex offenders, ID non-offenders and non-ID non-offenders on a dot-probe task using sexual stimuli. This study demonstrated that people with ID were able to complete

a task of this nature, but found that child sex offenders had no attentional bias for these images. Although the study used particularly salient stimuli, it was substantially underpowered, and as such, may have been unable to detect any significant differences between groups.

#### **1.4.5 Section Summary**

In light of the theoretical significance of attentional processes in theories of offending, this section considered the phenomenon of attentional bias. Its key role in the development and maintenance of mental health problems was discussed, and its significance in therapeutic interventions was considered. However, a literature review of attention bias in non-ID offenders revealed mixed evidence for attentional bias; over half of the studies conducted to date showed an attentional bias for salient related information, but the nature of this bias was mixed, and a significant proportion of the studies reported no attentional bias. However, a number of methodological differences and issues across these studies were acknowledged to make it difficult to draw reliable conclusions from the data. The attentional bias literature in people with ID was also considered, which equally revealed mixed findings. Together, these results suggest that cognitive tasks are capable of measuring attentional bias in offenders, and the use of pictorial stimuli in some of the tasks opens up this avenue of work for exploration in ID populations, for whom language can be a barrier.

#### **1.5 Chapter Summary**

This chapter opened with a description of people with ID, and people with ID who offend. A number of offending theories were discussed, and these were drawn together into a developmental model that can be used to describe offending in IDO. A central component to this model, attentional bias, was then considered in detail, followed by consideration of the way in which it relates to empathy, and how it has previously

been examined in non-ID offenders. This provides the backdrop to the rationale and hypotheses for the current study, which will now be outlined.

## **1.6 Rationale and Hypotheses**

### **1.6.1 Rationale and Outline of the Investigation**

Theoretical models of offending suggest that attentional bias is likely to be central to explaining the differences between offenders and non-offenders with ID (Garrigan & Langdon, In Press; Palmer, 2003). Only one investigation of attentional bias has been conducted in IDO, but in non-ID offenders, there is some evidence to suggest that this population has an attentional bias towards stimuli that are salient or relevant, though methodological problems and differences make it difficult to draw any reliable conclusions from the data. In addition, when considering the relationship between attentional bias and empathy, there is some evidence from the general population to suggest that the way in which attention is allocated varies with individual differences in empathy. However, this has not been examined in offenders, with or without ID.

Thus, current data is limited, inconclusive, and largely not applicable to IDO. Despite this, the concept of attentional bias has the potential to be a useful addition to the IDO literature; not only is it thought to be key to a number of explanations of offending, but it can be assessed objectively, does not rely heavily on expressive or receptive communication, and is not as susceptible to social desirability bias. The present study therefore sought to offer novel examination of attentional bias and empathy in across different offenders with ID. Firstly, a self-report measure of empathy, IDO and ID non-offenders (IDNO) will be compared to see if there are group differences in empathy. Secondly, using dot-probe task with negative-affective, positive-affective and global-affective (both positive and negative) stimuli, each group

will then be examined to see whether they have a vigilance or difficulty disengaging their attention from these types of stimuli, and whether they have a bias towards, or away from, positive and negative images. Finally, the data will be examined to see if there is a relationship between attentional bias and empathy.

Although research to date has been equivocal, based on similar methods (Hockley & Langdon, In Press) it is predicted that IDO will have lower empathy than the IDNO group. There are no comparable, within-group studies that consider how attention bias for affective information compares to neutral information. However, in light of evidence that suggests people with poor affective and interpersonal features have reduced affective responses and emotional disengagement, and offenders have impairments in recognition of affective information and perspective taking (Gery et al., 2009; Hanson, 2003; Seara-Cardoso et al., 2011), it can be predicted that IDO will attend to all types of stimuli in the same way, that is, will exhibit no vigilance or disengagement effects. Previous studies using the dot-probe task to compare non-offenders to offenders/adolescents with antisocial behaviour, have found an attentional bias for negative stimuli (Kimonis et al., 2006; Smith & Waterman, 2003), which may suggest that IDO will have an attentional bias for negative-affective information. Finally, based on studies in the general population (Hofelich & Preston, 2012; Preston & Stansfield, 2008), it is anticipated that attentional bias for affective information will be able to predict a significant percentage of the variance in empathy.

### **1.6.2 Research Questions and Hypotheses**

The follow research questions and hypotheses are proposed:

1. Research Question 1: Do IDO have lower empathy than IDNO?
  - a. Hypothesis 1: The IDO group will have significantly lower scores on the Empathy Quotient questionnaire than the IDNO group.

2. Research Question 2: Do IDO and IDNO groups have a bias for different types of image?
  - a. Hypothesis 2a: There will be no differences in RT when comparing negative-affective, positive-affective and global-affective (both positive and negative) trials, to neutral only trials, in the IDO group.
  - b. Hypothesis 2b: On the above trials, there will be significant differences in RT in the IDNO group.
3. Research Question 3: Are there differences between groups in attentional bias for affective information?
  - a. Hypothesis 3a: IDO will have a significant attentional bias for negative stimuli, in comparison to the IDNO group, controlling for relevant factors (age, IQ, anxiety and depression if appropriate).
  - b. Hypothesis 3b: There will be no group differences in attentional bias for positive-affective stimuli, or global-affective stimuli.
4. Research Question 4: Can attentional bias predict empathy?
  - a. Hypothesis 4: Attentional bias for global-affective, negative-affective and positive-affective stimuli will be significant predictors of empathy, controlling for relevant factors (age and IQ) if appropriate.

## **2 Methods**

### **2.1 Chapter Overview**

This chapter outlines the methodology used in the study. The design is described, followed by a description of the participants, and measures and materials. The data collection process is detailed, and ethical considerations pertinent to the research are discussed. Finally, necessary data preparations are outlined.

### **2.2 Design**

The study uses a quasi-experimental, non-equivalent mixed design (2 [Group: IDO, IDNO] x 2 [Trial Type: affective-stimuli congruent, affective-stimuli incongruent]) with group as the between-groups variable, and trial type as the within-groups variable. The trial type factor indicates whether the affective image in question (i.e. positive-affective stimuli, or negative-affective stimuli) is presented in the same location as the dot-probe. These factors are described in more detail in section 2.2.4. Two non-randomised groups were recruited, comprising people with ID who have offended (IDO group), and people with ID who have not offended (IDNO group). The dot-probe task comprises the main experimental paradigm. The study used quantitative analysis of questionnaire scores and dot-probe paradigm responses to investigate whether there is a significant difference between the groups on measures of empathy and attentional bias. Participants in both groups also completed measures of IQ, anxiety and depression. All measures were taken at a single time point.

### **2.1 Participants**

#### **2.1.1 Power Calculations**

Power calculations represent the probability that effects or differences that exist within the population from which a sample is derived, have a chance of reaching statistical significance in research (Tabachnick & Fidell, 2001). In order to determine an

appropriate sample size, multiple *a priori* power analyses were undertaken, according to the proposed hypotheses, using G\*power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009). Calculations were based on data from previous studies investigating similar hypotheses with people with ID (Dodd & Porter, 2010), and IDO (Hockley & Langdon, In Press; Watson, 2006). Power and alpha (one tailed) were set at the conventional levels of  $1-\beta = .80$  and  $\alpha = .05$  (Kazdin, 2003).

The power calculation for hypothesis 1 used directly comparable data from a previous study investigating empathy in a similar population, using the same assessment tool (Hockley & Langdon, In Press). Using a t-test calculation (difference between two independent means, with two groups, effect size  $d = .97$ ), a necessary total sample size of 28 was predicted. For hypothesis 2b, the only comparable study in this population did not report RT data (Watson, 2006). Comparable data points in people with ID, specifically, Williams syndrome, could be obtained from an investigation of attentional bias to threat stimuli and happy faces (Dodd & Porter, 2010, 2011), however these samples are not ideal as they include children and young people, and were specifically examining attentional bias in a group whose behavioural phenotype centres upon a preference for the stimuli under examination. Without appropriate data on which to base the calculation, a medium effect size  $d$  of 0.5 was used for a t-test calculation, resulting in a total sample size of 102.

For hypothesis 3a, firstly without considering covariates, data from a previous, comparable study is available (Watson, 2006), however the sample size of the ID groups was small (ID child sex offenders  $n = 17$ ; ID non-offenders  $n = 18$ ), and consequently the standard deviations are very large and unusual for studies using similar methods (Group 1:  $M = .81$ ,  $SD = 2.89$ ; Group 2:  $M = -.63$ ,  $SD = 3.11$ ). For example, in an ID population of people with Williams Syndrome, Dodd and Porter (2011) reported mean



RT of approximately .63 and SD of approximately .09. Using the SD reported by Watson (2006) indicated that a sample of 110 participants would be needed. However, using a smaller SD (SD = 1.5), but still large in comparison to other studies using similar methods, indicated that a sample of 30 participants was required (t-test calculation; effect size  $d = .96$ ). Considering the inclusion of up to four covariates, no suitable previous studies could be obtained on which calculations could be based. Using an ANCOVA test (fixed effects, main effects and interaction) adopting a conservative approach (effect size  $f = .35$ ), a sample size of 67 was estimated. Finally, for hypothesis 4, again due to the limited previous investigations, no appropriate studies were available from which data could be obtained. However, assuming conservative correlations between predictors (age, IQ and attentional bias; .2, .2 and .3 respectively) and outcome (empathy) using a linear multiple regression test (effect size  $f^2 = .20$ ), a total sample of 58 participants was estimated. Power calculations are not given for hypothesis 2a and 3b, as they are in effect null hypotheses.

The difficulties in obtaining a reliable estimate of power, given the limited previous investigations in people with atypical development, are acknowledged. Using best estimates, recruitment plans for the present study were based upon a sample size of 67 participants, however it should be noted that as this study is part of a larger project (see section 2.1.5), and the total sample size for this project is 98 participants.

## **2.1.2 Sample**

### **2.1.2.1 Attrition**

Thirty-seven participants were recruited each to the IDO group, and the IDNO group. However eight participants who had completed the consent forms were unable to take part in the study. One person was too fatigued to be able to concentrate during the assessment (IDNO  $n = 1$ ), two people signed the consent form then declined to

participate, without giving a reason (IDO  $n = 1$ , IDNO  $n = 1$ ), and three people completed a measure of IQ, and were above the study threshold (IDO  $n = 2$ , IDNO  $n = 1$ ). The two final people found the questionnaires and computer task too difficult to complete (IDO  $n = 1$ , IDNO  $n = 1$ ). Before deciding that the participants were unable to complete the assessment, additional support was given in order to see if this facilitated their participation, in the form of additional instructions for both the paper and computer based tasks, and encouragement to carry on, where appropriate. When it was established that they would be unable to take part, it was collaboratively agreed between the participant and the researcher that the assessment wasn't right for them, and they did not take part in the study, but were given financial reimbursement (shopping vouchers) to thank them for their time.

#### **2.1.2.2 Final Sample**

In total, 66 participants were able to complete the study in full. Thirty-four men were recruited to the IDO group ( $M_{\text{age}} = 33.06$ ,  $SD = 13.29$ , range 18-59 years), and 32 men were recruited to the IDNO group ( $M_{\text{age}} = 43.47$ ,  $SD = 14.71$ , range 19-65 years). The mean IQ of the IDO group was 63.42 ( $SD = 4.82$ , range 50-70) and the mean IQ of the IDNO group was 61.19 ( $SD = 4.82$ , range 55-69).

#### **2.1.3 Inclusion Criteria**

Any individual was considered eligible to take part if they met the following criteria: (a) aged between 18-65 years, (b) male, (c) an ID of "mild" severity (American Psychiatric Association, 1994); that is, a full scale IQ between 50 and 70 (Wechsler, 1999), and (d) had the capacity to give, or withhold, informed consent. Capacity for consent was determined in line with Mental Capacity Act (2005), and ascertained by the researcher at the time of meeting the participant, together with guidance from any individual who knew the person well. Participants were recruited to the IDNO group if

they had no self-reported history of arrests, cautions or convictions, which was confirmed with staff members or carers as best as possible. Participants were recruited to the IDO group if they had a documented history of at least one Crown Court conviction that led to a custodial sentence.

#### **2.1.4 Exclusion Criteria**

Participants were excluded if they had a diagnosis of dementia and/or acquired brain injury, as the presence of an additional cognitive impairment could bias the results. Women were also excluded, as evidence suggests that gender differences exist in attentional bias (Tan et al., 2011; Vitale, 2011) and empathy (Baron-Cohen & Wheelwright, 2004), could significantly confound the findings. Furthermore, the population of people with ID in forensic settings is predominantly male, and so the above criteria were set in order to most accurately reflect the clinical population. Similarly, IQ in the “mild” range was used to define inclusion criteria, as ID offenders typically have this level of functioning (Salekin et al., 2010).

#### **2.1.5 Recruitment Strategy**

Participants were recruited from services across the east of England. IDO were recruited from NHS and independent sector secure forensic services, where they were currently detained under the Mental Health Act (2007). IDNO were recruited from day services and NHS or social care community ID teams. In order to identify potential participants, the researcher presented the study to staff at each site. Staff were given both staff and participant information sheets (Appendix 6 and Appendix 7), and were then asked to identify individuals in their service who they thought might meet the research criteria. They gave the participant information sheets and verbal explanations to these individuals. Any person who was interested in taking part was advised to

express this to the staff, who then informed the researcher. A flowchart of the recruitment procedure is shown in Appendix 8.

In order to facilitate recruitment within appropriate timescales, this study was carried out as part of a larger study, and alongside another trainee research project. The focus and content of the trainee project, aside from collection of demographic information was entirely independent. A summary of the overlap between projects is outlined in Appendix 9.

## **2.2 Materials**

### **2.2.1 Demographic Data**

Demographic data was obtained directly from participants, consisting of age, ethnicity, marital status, any dependents, education leaving age, known physical and mental health problems, and information about previous convictions. This took between 5 and 10 minutes to complete, and consent was obtained from participants in order reference relevant records, to verify this information. Appendix 10 contains the full data collection pack.

### **2.2.2 General Intellectual Functioning**

Cognitive assessment was used to establish an individual's IQ. Where possible, an existing measure of participants' Full Scale IQ (FSIQ) was obtained from their records. These scores were considered acceptable for use in the study if they were obtained within the last three years, using either the Wechsler Adult Intelligence Scale, third or fourth editions (WAIS-III, WAIS-IV; Wechsler, 1997, 2008), or the Wechsler Abbreviated Scales of Intelligence, first or second editions (WASI, WASI-II; Wechsler, 1999, 2011). The Wechsler scales are a nationally standardised set of intelligence scales, which are administered by a trained professional, for use in individuals aged 6-89.

Those participants who did not have an FSIQ on record were asked to complete the two subtest version of the WASI. Assessment lasted a maximum of fifteen minutes, and could be scored immediately, making it possible to determine eligibility for the study straight away. It comprised a Vocabulary Subtest, which assessed word knowledge and verbal concept formation, and Matrix Reasoning Subtest, which measured abstract reasoning skills and visual processing. Information was presented visually, responses were given manually or verbally, and performance was converted to an age standardised score. The two subtest version of the WASI yields a full-scale IQ (FSIQ-2) on the basis of only two subtests, but unlike the four subtest version, is unable to produce Performance and Verbal IQ estimate scores. It has good reliability ( $\alpha = .84-.98$ ) and high test-retest reliability (0.92; Wechsler, 1999). It is seen to be the most useful measure of IQ when time is constrained, but an accurate, overall summary of an individual's general intellectual functioning, and is deemed to be acceptable for use in research (Axelrod, 2002).

In the IDO group, IQs were ascertained using from the file using the WAIS-IV (25%), the WAIS-III (25%), or as part of the research assessment using the WASI (50%). In the IDNO group, all IQs were assessed during the research using the WASI.

### **2.2.3 Empathy Quotient**

The Empathy Quotient (EQ; Baron-Cohen & Wheelwright, 2004) is a self-report measure. It is described as a global measure of empathy (Lawrence, Shaw, Baker, Baron-Cohen, & David, 2004), comprising three main aspects: cognitive empathy, reflected in statements such as "I can't always see why someone was offended by a remark", emotional reactivity or affective empathy, e.g. "I get upset if I see people suffering on the news programmes", and social skills, e.g. "Friends usually talk to me about their problems as they say I am very understanding". The authors did not separate

cognitive and affective empathy constructs due to their overlap (Baron-Cohen & Wheelwright, 2004). The original measure contains 40 empathy statements and 20 unscored filler statements; the filler items were removed from the questionnaire in the present study. The measure requires participants to indicate their level of agreement to the empathy statements using a 4-point rating scale from ‘strongly agree’ to strongly disagree’, and approximately half of the items are reversed scored. Higher scores on the EQ indicate higher levels of empathy.

In the general population and people with developmental disabilities, the EQ has robust psychometric properties. It has moderate concurrent validity with subscales of other measures of empathy, such as the Interpersonal Reactivity Index (Lawrence et al., 2004), and high test–retest reliability ( $r = 0.83$ ; Baron-Cohen and Wheelwright, 2004). In men with ID, internal consistency of  $\alpha = .64$ , which rates as “questionable” (George & Mallery, 2003) has been reported (Hockley & Langdon, In Press), but was based upon a sample comprising only 35 participants. One reason for this may be because the wording of the EQ is complex, and so has the potential to be confusing for people with ID. For example, a statement might contain a hypothetical scenario, or use double negatives. In order to minimise the likelihood of this confounding the results, the researcher read each statement aloud, and presented participants with a visual analogue scale to aid response giving (Appendix 14). The researcher also checked the participants understanding of the statements, to ensure this matched the response given. In the current study, the Cronbach alpha coefficient of the EQ was “good” (George & Mallery, 2003),  $\alpha = .88$ .

#### **2.2.4 Affective Pictures Dot-Probe Task**

The dot-probe task was used to assess attentional bias towards affective stimuli. This involves the sequential presentation of pairs of images on a computer screen,

followed by the brief appearance of a dot. Participants make a timed response to indicate the location of the dot. Three studies have described the reliability and validity of this measure. In a task using anxiety related stimuli in a non-clinical group, Schmukle (2005) suggests a poor reliability estimate of internal consistency and test-retest reliability ( $r = <.2$  and  $r = <.3$  respectively), using both picture and lexical stimuli. In the second study (Staugaard, 2009), again using anxiety related stimuli, but this time using images of faces, found similarly poor levels of internal consistency and test-retest reliability. The length of time presentation of the stimuli was varied across two conditions, and results were consistently low ( $r = <.4$ ). However, their findings suggested that groups had stable and consistent engagement for emotional faces, and suggested that the task was appropriate when used within a between-group design, when investigating attention to affect-based stimuli. In the third study investigating the psychometric properties of the task in a clinical population, Dear, Sharpe, Nicholas and Refshauge (2011) used pictorial and lexical stimuli in people with chronic pain, and again, reported poor internal consistency for both sets of stimuli ( $r = <.25$ ).

Necessarily, caution is required when generalising these findings, given that they have focused only on anxiety-related attention biases, and only one has used a clinical sample. Whilst no reliability or validity data are available specifically within an ID or offending populations, it should be noted that the dot-probe is a widely used task across a wide range of clinical and non-clinical populations, and is an established assessment tool of attentional bias (Cisler et al., 2009).

#### **2.2.4.1 Stimuli**

Pictorial stimuli, rather than lexical stimuli, were selected for the task, as this was thought to be more appropriate for people with ID, and because images are more strongly related to affect (Glaser & Glaser, 1982; Loney, Frick, Clements, Ellis, &

Kerlin, 2003). As the population under investigation involved a mixed sample of offenders, affective, rather than offence-related pictures were used. Pictures were taken from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2008). This is a standardised set of over 900 affect-inducing colour images validated for experimental use (Verschuere, Crombez, & Koster, 2001). Using a nine point Likert scale, each image has previously been rated by men and women for the emotional response it elicits, and factor analysis data has revealed two key dimensions to the images (Lang, 1980); valence (ranging from pleasant to unpleasant) and arousal (from calm to excited). A third, less significant dimension of dominance or control (from totally controlled to totally in control) has also been reported. Together, these ratings enable researchers to select a group of stimuli which share similar, multidimensional affective properties (Scherer, Dan, & Flykt, 2010).

All pictures used in the task were presented at a standardised height of 9.63cm and width of 13.54cm. It was necessary to optimise homogeneity across the images, therefore all images were in landscape orientation. Furthermore, given the sample under investigation, images were considered inappropriate for the task if they contained nude/erotic images, or children. Twenty-four images were selected for use in the main task; eight positive, eight negative, and eight neutral. Within each category, four images contained people, and four contained objects (images are shown in Appendix 11), in order to counterbalance for image types across conditions. Guidance on selection of positive and negative images was not available from existing literature, and so criteria were set using the rating available from the standardised Likert scales to distinguish positive and negative images from neutral images, and to ensure positive and negative images had similar affective properties. This was particularly important as previous

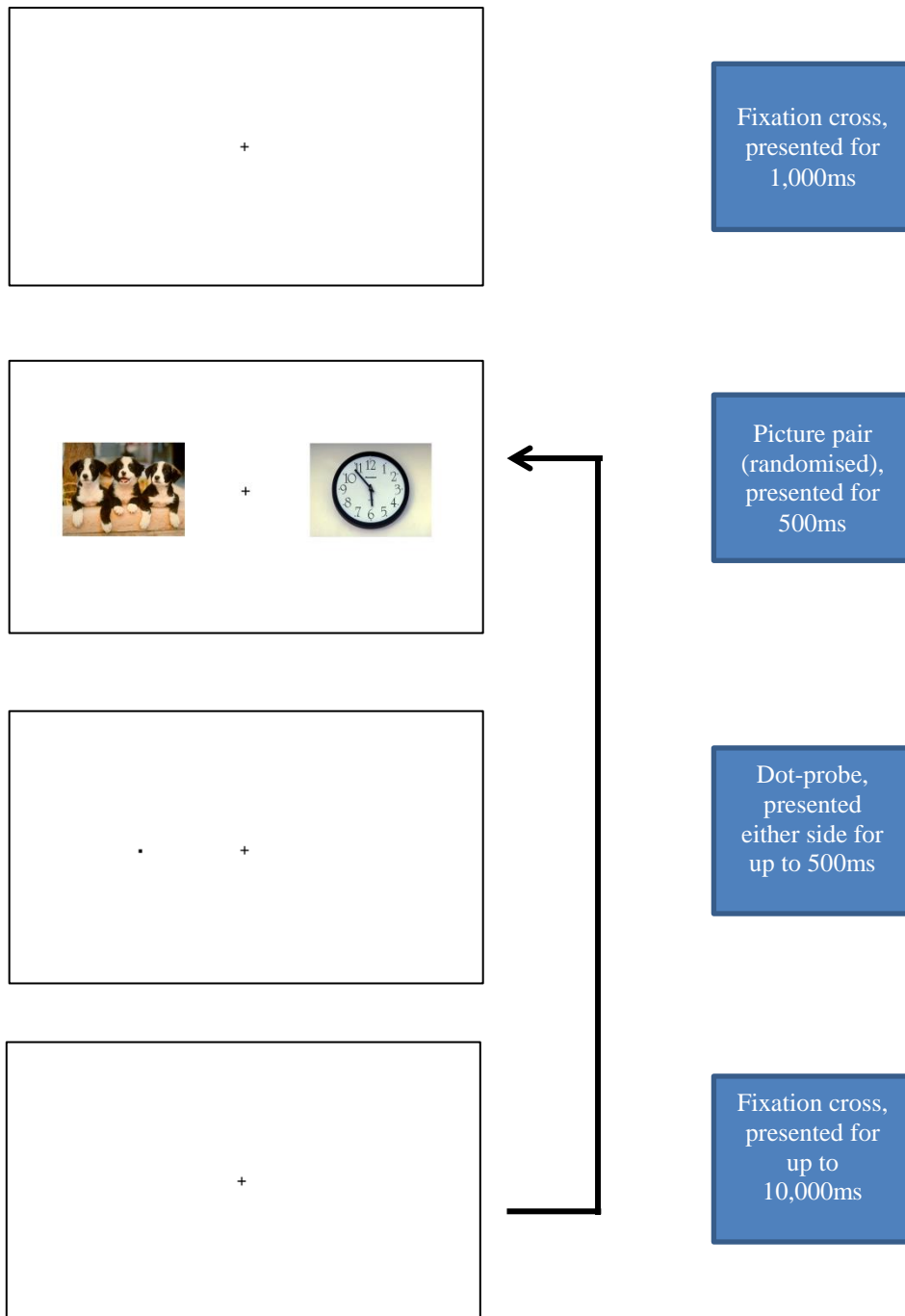


evidence suggests the extent to which valence or arousal interferes with information processing is unclear (Schimmack, 2005).

Using the Likert score for valence, positive and negative images were selected from those images scored in the top or bottom (respectively) 1.5 points. Neutral images were selected from those which scored +/- .35 points around the mean of the valence scale. Positive and negative images were also matched on scores of arousal; images were only considered suitable if they were rated between 5 and 9 on the arousal scale. All neutral images rated below 4 on the arousal scale. Similar to other studies e.g. (Scherer et al., 2010), dominance ratings were not utilised in the selection criteria, as this dimension only explain a limited proportion of the variance in evaluative judgments of these stimuli (Coan & Allen, 2007).

#### **2.2.4.2 Trials**

The format of a single trial is represented below (Figure 4). A single trial could last for up to 11,000ms, and contained: (1) a central fixation cross (presented for 1,000ms; first trial in the block only), (2) the fixation cross and two pictures, which are presented directly to the left and right of the cross (500ms), (3) the fixation cross, and a small circle (the dot-probe) located either to the left or the right of the cross, corresponding to the centre point of one of the presented pictures (500ms), followed by (4) the fixation cross alone. This remains until a response is made by the participant, at which point, a new trial is automatically started. A response can be made any time up to 10,000ms, but is typically made in fewer than 1,000ms. Pictures were presented side by side, rather than in parallel vertically in order that they were congruent with the orientation of buttons on the response box (described below).

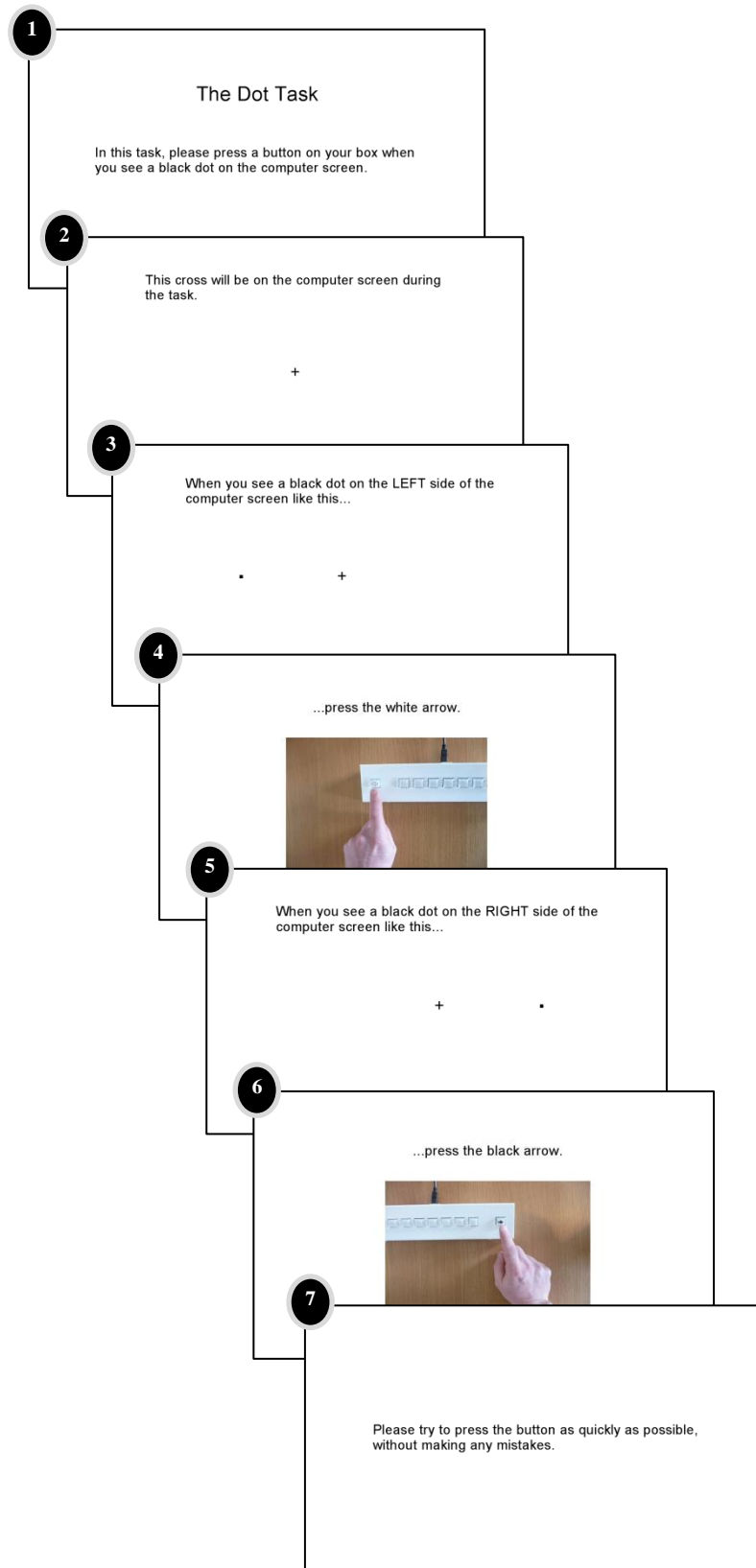


**Figure 4. Representation of a Trial on the Dot-Probe Task.**

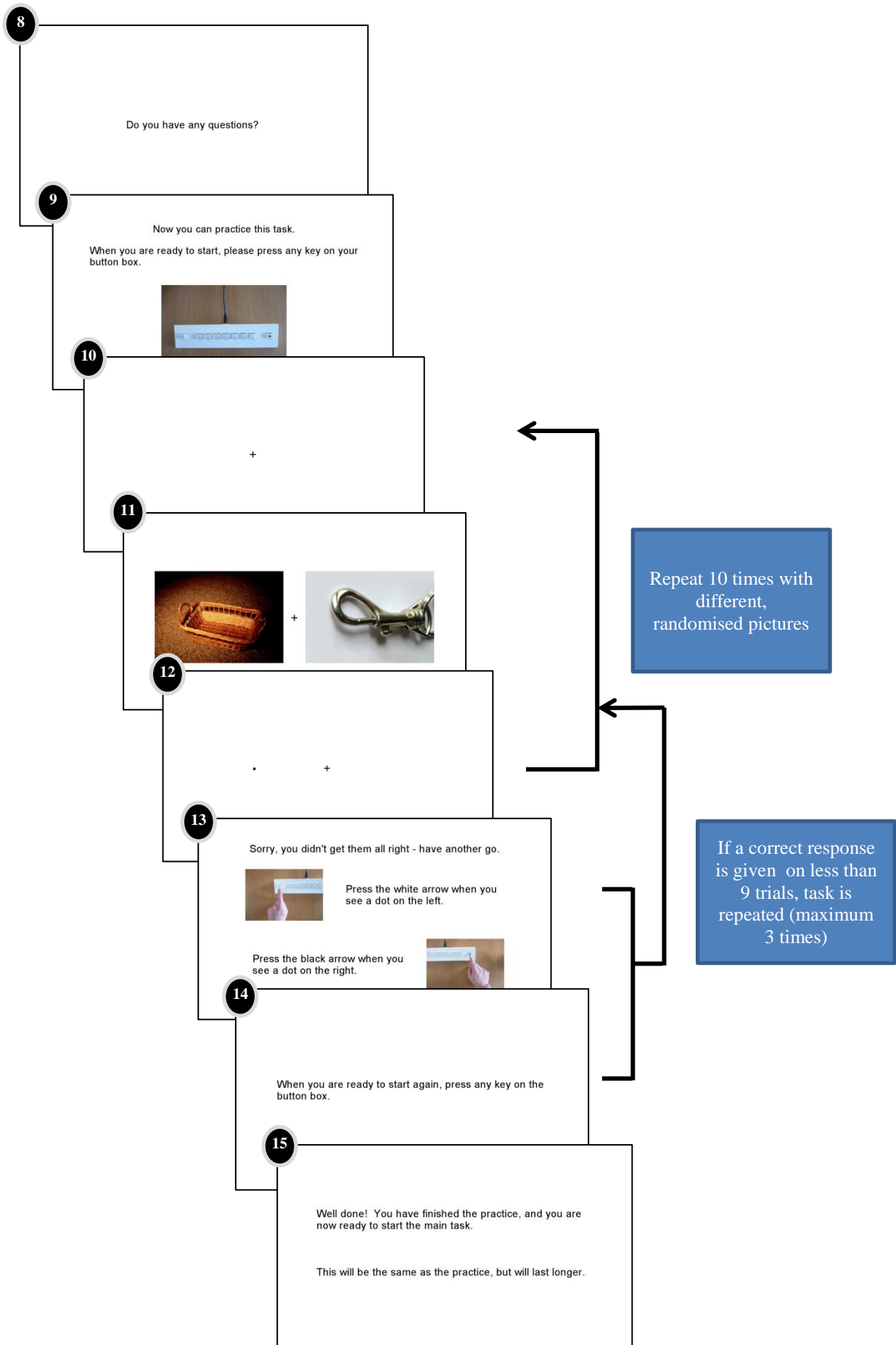
Duration of stimulus presentation (500ms) was based on previous research in people with ID and offenders (Dodd & Porter, 2010, 2011; Smith & Waterman, 2003). The main task contains 368 trials, of which 112 trials contain two neutral images (Neutral-Neutral Trial), 128 trials contain one positive-affective and one neutral image (Positive-Affective Trial), and 128 trials contain one negative-affective image and one neutral image (Negative-Affective Trial). Within the positive and negative conditions, each trial could be classified as either congruent or incongruent. A congruent trial is one where a dot-probe replaces an affective image (that is paired with a neutral image). An incongruent trial is one where a dot-probe replaces a neutral image (that is paired with an affective image). In Neutral-Neutral trials, as neither image is affective, the position of the dot-probe is neither congruent nor incongruent.

#### **2.2.4.3 Practice Procedure**

A short computerised explanation of the task was provided, instructing participants to indicate whether a dot appears on either the left or the right side of the screen, using a response box (see Figure 5 and Figure 6). All computerised explanations were supported by a verbal explanation of the task, given by the researcher. Participants were asked to press a button with a black arrow located on the far left of the box if the dot is on the left side of the computer screen, and a button with a white arrow on the right if a dot appearing on the right. Participants were instructed to respond as quickly as possible, avoiding making errors.



**Figure 5. Practice Information for the Dot-Probe Task: Part 1.**



**Figure 6. Practice Trials for the Dot-Probe Task: Part 2.**

Three practice blocks are then presented, each comprising 10 practice trials. If participants achieved nine or ten (out of ten) trials correct, in either the first, second or third practice blocks, they could move directly to the main task, where they were presented with computerised instructions indicating that the main task will begin. However, if they made two or more errors within a practice block, they were required to complete another practice block. If they made two or more errors in each of three practice blocks, the task was discontinued. Pictures used in the practice are different to the pictures used in the main task, and are all neutral in content (Appendix 12).

#### **2.2.4.4 Main Task Procedure**

Participants sat comfortably with their heads approximately one metre away from the laptop, with the screen angled to ensure optimum viewing of the images. The 368 trials in the main task are grouped into eight blocks containing 46 trials. Within each block, the trials were presented continuously. The end of each block is denoted by the following words on the screen: “When you are ready to start again, press any key on the button box”, giving participants a brief comfort break before they resumed the task. Participants could control the start of the next block by pressing the space bar.

#### **2.2.4.5 Counterbalancing and Randomisation**

The following factors were counterbalanced across the left and right visual fields, for all of the main task trials: dot-probe position, position of the affective image position within a picture pair, position of the object/person position within a picture pair, congruency of the dot-probe and affective image. The order in which trials were presented was randomised, generated by the presentation software, and so differed for each participant in order to eliminate order effects.

#### **2.2.4.6 Software and Hardware**

The dot-probe task was programmed using PsychoPy v1.75.01 software (Peirce, 2007), and presented using Psychopy v1.74.00. This was presented on Toshiba Satellite Pro C850-1K4 laptops, Microsoft Windows 7 Enterprise Operating System (Intel Core i3-3120M CPU, 2.5GHz, 4GB installed RAM), 15" screen, 1366 x 768 resolution, set to 60Hz screen refresh rate, True Colour (32bit) and maximum brightness. Three computers were used for the study, all of which had the same specifications.

A serial response box, DirectIN High Speed Button-Box v2012 manufactured by Empirisoft, was used to record participant responses. It connected directly to the laptop via USB, and responses were delivered to the computer in less than 1ms. The box was oblong shaped, containing nine key keys in landscape orientation, where the first and last keys are separated from the central keys (keys two to eight) so that they are at the extremities of the box. Participants were asked to use the keys farthest to the left and right, to respond to the respective dot-probes on the screen. The keys to press were denoted with black and white arrows.

Response boxes were used as they provide a more accurate response time than a standard computer/laptop keyboard or mouse, which typically are not considered precise enough for experiments requiring accurate response times (Schneider, Eschman, & Zuccolotto, 2002). Although a keyboard could have been used, it was felt that having the target key in amongst other keys would be confusing for participants, and would increase the likelihood that they would need to look down at the keyboard to ensure they were pressing the correct key, which could have significantly influenced overall RT.

### **2.2.5 Anxiety and Depression Questionnaires**

Previous research has demonstrated that different levels of anxiety within the population can have influence attentional bias in the general population and in offenders (Lorenz & Newman, 2002a), therefore it was deemed necessary to measure and co-vary

for this where appropriate. Depression is also known to exert differences in attentional bias (Gotlib et al., 2004). In light of the negative content of some of the images being used, this was also measured, in order to include as covariates if appropriate.

The measures selected to investigate anxiety and depression were self-report, and use a 3-point Likert response scale and visual analogues scale (Appendix 14), where higher scores on both measures indicate higher levels of anxiety and depression respectively. Each took between 10-15 minutes to complete. They are considered to be the most promising of the available self-report screening measures for ID, based on a comparison of relevant psychometric properties (Hermans & Evenhuis, 2010; Hermans, van der Pas, & Evenhuis, 2011).

#### **2.2.5.1 Glasgow Anxiety Scale**

The Glasgow Anxiety Scale for people with an Intellectual Disability (GAS; Mindham & Espie, 2003) was used to measure anxiety. It has good content and discriminant validity when comparing anxious ID, non-anxious ID and anxious non-ID groups, and good test-retest reliability ( $r = .95$ ) and internal consistency ( $\alpha = .96$ ). It also has acceptable criterion validity ( $\rho = .72$ ) when compared to the Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988). In the current study, internal consistency was reported to be  $\alpha = .86$ .

#### **2.2.5.2 Glasgow Depression Scale**

The Glasgow Depression Scale for people with a Learning Disability (GDS-LD; Cuthill, Espie, & Cooper, 2003) was used to measure depression. Psychometric properties for this measure are also acceptable; it has good test-retest reliability ( $r = .97$ ), internal consistency ( $\alpha = .90$ ), and it correlates positively with the Beck Depression Inventory – II ( $r = .88$ ). It has good discriminant validity for depressed ID and non-



depressed ID groups. Internal consistency in the current use of the measure was rated as  $\alpha = .84$ .

### **2.3 Procedure**

Following the recruitment procedures detailed in section 2.1.5, the researcher arranged to meet the potential participant; all potential participants could have someone else present during this and subsequent meetings. The researcher gave further explanation of the study, ensured that information sheets had been read and understood, and answered questions pertaining to participation in the study. If potential participants met the inclusion criteria, they had up to two weeks to decide if they wanted to take part, with the option of proceeding immediately if they wished. Written consent to participation was taken from all participants (Appendix 13).

All identified participants were tested individually in a quiet room. The measures described in this study took approximately one hour to complete, however the completion of additional tasks for the second trainee study meant that assessments lasted approximately two hours in total. The researcher sat with the participant for the duration of the session. Participants had the option of taking breaks in between tasks if they wished.

Demographic sheet was completed first, followed by IQ assessments for any participant who did not have an IQ score on file within the service where they were seen. The dot-probe task was completed as described above. The remaining measures were completed in the following order: GAS, GDS, EQ. These measures were read aloud to participants, presented in a written format, and participants had the option of using a visual analogue scale to assist in giving their response (Appendix 14). The order of assessments was not counterbalanced, as previous studies have noted that the completion of emotion-based questionnaires immediately before an attentional bias task can prime

the participants emotion-cognition networks, and thus can influence the way in which their attention is allocated (Todorov & Bargh, 2002).

Recruitment was shared between three researchers. The current author collected half of the data (IDO  $n = 18$ , IDNO  $n = 17$ ), with the remainder being collected by another trainee (IDO  $n = 15$ , IDNO  $n = 14$ ), and the supervisor (IDO  $n = 4$ , IDNO  $n = 6$ ).

## **2.4 Ethical Considerations**

### **2.4.1 Ethical Approval**

A favourable ethical opinion was gained from the South West National Research Ethics Committee Service (Reference No: 13/SW/0084; Appendix 15). Applications to conduct research within five NHS trusts were requested and granted; Norfolk Community Health and Care NHS Trust, South Essex Partnership University NHS Foundation Trust, Cambridgeshire and Peterborough NHS Foundation Trust, Hertfordshire Partnership NHS Foundation Trust, and Leicester Partnership NHS Trust (Appendix 16). Private forensic psychiatric units Partnerships in Care and St Andrew's Healthcare also granted permission to act as recruitment sites.

Ethical approval was contingent on the production of a satisfactory interim report; the Committee requested that after the first ten participants were recruited, recruitment should be temporarily halted, and a report should be provided detailing how the research was progressing. Specifically, the Committee asked to hear whether any of the participants had experienced distress in response to the images. The report produced was satisfactory (no adverse events were reported), and recruitment was allowed to proceed.

## **2.4.2 Decision Making**

Whilst the inclusion criteria ensured all participants would have capacity to give consent, people with ID experience a number of difficulties which can impact on their ability to make decisions, such as difficulty processing complex information, and a tendency towards acquiescence and suggestibility (Clements, 1987; Ellis, Deacon, & Wooldridge, 1985; Morris, Niederbuhl, & Mahr, 1993; Murphy & Clare, 1995). Furthermore, the implicit power balance that exists between researchers and participants has the potential to compound these difficulties. A possible implication of potential participants experiencing these difficulties is therefore that they may consent to participation without understanding the full implications. The following processes were put in place in order to reduce this risk, and to facilitate potential participants in making an informed, individual decision about participation.

### **2.4.2.1 Reducing Coercion**

To reduce the possibility of coercion, potential participants were initially approached about the study by an individual whom they knew well, such as their key worker. They then had the opportunity to discuss the study with staff, and time to consider whether they wished to participate. At the time of taking consent, participants all had the option of having someone they knew present when the study was being explained and consent was being sought, such as a family member or carer. They also had the option of having someone present with them throughout the full assessment, although it was made clear that the person providing support could not provide help to the participant in the completion of any of the tasks.

### **2.4.2.2 Ensuring Capacity**

Managers were asked to only identify participants who they thought would be able to: (a) understand the purpose and nature of the research, (b) understand what their

involvement would entail, (c) understand benefits to taking part, (d) understand the risks, burdens and alternatives to taking part, (e) could retain the information long enough to make an effective decision, and (f) make a free choice. However, it was still possible that researchers would come into contact with people who did not have capacity to consent. Researchers therefore had ultimate responsibility for ensuring that potential participants had capacity to consent to participation, and followed guidelines provided by the Mental Capacity Act (2005).

#### **2.4.2.3 Taking Informed Consent**

Information sheets were designed using guidelines to promote ease of reading and understanding (Flesch, 1948), in order to make them accessible and transparent. Jargon and use of abstract concepts has been minimised, and words, sentences and paragraphs have been kept short and simple. Following the initial opportunity to read the information sheet, this information was reviewed in detail with the researcher before consent was taken, as reinforcement of information is considered good practice with people with ID (Clare, 1993). It was made clear that the decision to participate would not affect either current or future care, and that participants could withdraw from the study at any time, without giving a reason.

#### **2.4.3 Confidentiality**

Data acquisition and storage complied with the Data Protection Act (1998). Identifiable information was kept under a coding system, and separate to all research data, which was anonymised. All paper records were kept in locked filing cabinets and stored securely in the office of the Chief Investigator. Electronic files containing data were password protected, and stored on password protected computers, and any electronic transportation of data was encrypted. No data which would enable the identification of the participant was transmitted electronically. Confidentiality and data

protection was explained to participants. Confidentiality applied to all aspects of data collection, however, participants were clearly advised at the start of the assessment to only discuss disclosed offences with the researcher. It was made clear that should they disclose any previously unmentioned offences, the researcher would be obliged to share this information with the relevant authorities. It should be noted that no participant disclosed an offence that had not previously been recorded.

#### **2.4.4 Distress**

The pictures used in the dot-probe task were selected as they were rated high on scales of emotional arousal. It was acknowledged that some of these images had the potential to be perceived as distressing, and so it was necessary to consider the possible impact this may have on participants. Firstly, the picture was presented to participants for only 500ms. Thus, although participants were able to perceive the image, they would not be able to fixate upon the content for a prolonged period, which reduced the probability of experiencing distress. Secondly, all of the images had been validated with research populations (Lang et al., 2008), and have been used in other clinical studies of attentional bias of affective stimuli (e.g. Kimonis et al., 2006).

Thirdly, the following protocol was agreed and observed during data collection: (1) participants were informed that some of the images may be distressing before they took part; (2) they were reminded that they could terminate their participation at any point, even whilst taking part in the task; (3) researchers monitored participants for signs of distress throughout the assessment - if they appeared distressed or upset in any way, this task (or any other, if relevant) was to be stopped, participants were offered a break, and they were reminded that they may withdraw from the study if they wished; and (4) if a participant became distressed, a member of staff from the recruitment site was informed. This information was also communicated to the Chief Investigator, who was

available to offer advice where necessary. In accordance with good clinical practice (Medical Research Council, 1998), any observed distress was recorded and monitored throughout the study. Only one record was made; one participant reported distress at seeing the positive-affective picture of puppies, as it reminded him of his dog that has passed away, but when asked, said he was willing and able to carry on with the task.

#### **2.4.5 Debriefing**

All participants were offered an opportunity to debrief following the assessment, where they could be given an explanation of the purpose and the findings of the study. Where this was requested, this was done idiosyncratically, in order to match the needs and abilities of the individual. All professionals who expressed an interest in the results of the study were also offered the opportunity to receive the results of the study.

#### **2.4.6 Researcher Safety**

Unit policies, and local and national operating procedures regarding health, safety and risk, were adhered to at all times. It was agreed that a member of staff from the service where the participant was recruited would be informed if any issues concerning the researcher arose.

#### **2.4.7 Participant Reimbursement**

Similar to previous studies in this population (Langdon, Murphy, Clare, & Palmer, 2010), participants who completed 50% or more of the current study were given a £20 shopping voucher to thank them for their participation.

### **2.5 Data Preparation**

#### **2.5.1 Data Analysis**

Descriptive data were generated and examined, and any identified errors were corrected as appropriate. A comparison of the mean and 5% trimmed mean showed all values to be similar, so all data was retained. Data were inspected for departures for

normality by visual inspection of histograms and the generation of Q-Q plots. Overall, Kolmogorov-Smirnov tests with Lilliefors Significance Correction revealed all except four variables (IQ, EQ, GDS and GAS scores) departed from normality in either one or both groups (see Appendix 17 for results of this test). Difficulties meeting assumptions of parametric tests is common when using RT data, and the data are often skewed (Gress & Laws, 2009). Where parametric statistics could not be applied, Field (2013) argues that bootstrapping, a nonparametric resampling procedure, is a more powerful alternative to parametric statistics. It involves repeated sampling from the original data, estimating the indirect effect in each re-sampled data set, thus deriving an empirical approximation of the sampling distribution which is then used to create percentile confidence intervals. Normality assumptions are not necessary and bootstrapping generates robust estimates.

Where parametric statistics were not appropriate, bootstrapping was therefore used, and bias corrected and accelerated ( $BC_a$ ) confidence intervals were calculated and reported. The recommended number of bootstrap samples has increased over time (Wagstaff, Elek, Kulis, & Marsiglia, 2009), and it is suggested that good estimates of confidence intervals often require 5,000 samples or more. Statistics reported in the results were derived using the original data, and the significance level and the 95%  $BC_a$  CI were derived using bootstrapping with 5,000 samples. If the  $BC_a$  confidence interval crosses zero, the data was considered not to be statistically significant. All tests were two tailed, performed at the  $p \leq .05$  significance level, and equal variances are assumed unless stated.

### **2.5.2 Errors and Outliers**

Output files from the dot-probe task were generated in Excel 2010, and data were transferred into SPSS-IBM, version 21 (IBM Corporation, 2012). In line with previous

studies, any incorrect responses given by participants were excluded from the analysis. There were significant differences in terms of the numbers of errors made; IDO made fewer errors,  $M = 9.94$ ,  $SD = 14.12$ , than IDNO,  $M = 24.91$ ,  $SD = 37.72$ ,  $t(56) = -2.12$ ,  $p = 0.04$ ,  $BC_a$  95% CI [-31.94, -2.16].

Similar to protocols used in other studies, RT that were more than two standard deviations above each participant's mean were removed (Koster et al., 2004; Mogg, Bradley, Miles, & Dixon, 2004). There were no significant differences between groups in terms of the numbers of outliers identified and removed: IDO  $M = 10.42$ ,  $SD = 7.51$ , IDNO  $M = 11.31$ ,  $SD = 6.00$ ,  $t(63) = -.53$ ,  $p = 0.60$ ;  $BC_a$  95% CI [-4.04, 2.43]. As part of learning the task requirements, participants were able to practice the task up to three times. In the IDO group, 94.1% ( $n=32$ ) needed one practice trial, and 2.9% ( $n=1$ ) needed two. In the IDNO group, 84.4% ( $n=27$ ) needed one practice, and 15.6% ( $n=5$ ) needed two.

### **2.5.3 Preparation for Analyses**

#### **2.5.3.1 Vigilance and Disengagement (Hypothesis 2a and 2b)**

Mean RT on Congruent and Incongruent trials (described in section 2.4.1) were compared to RT on Neutral-Neutral trials, in order to determine whether any within group RT differences were a consequence of attentional vigilance, or attentional disengagement. This was conducted separately for each trial type (Negative-Congruent Trials, Negative-Incongruent Trials, Positive-Congruent Trials, Positive-Congruent Trials, Global-Affective-Congruent Trials, and Global-Affective-Incongruent Trials).

In order to understand whether participants were vigilant for affective stimuli, responses to congruent trials are observed. When participants have faster responses on Congruent trials compared to Neutral-Neutral trials, this results in a negative (-) number, which suggests that individuals preferentially hold their attention at the affective



location. When participants have slower RT on Incongruent trials in comparison to Neutral-Neutral trials, this results in a positive (+) number, which indicates that they have difficulty disengaging attention from affective stimuli, as time is needed to shift attention from the affective to the neutral location (Koster et al., 2004).

### **2.5.3.2 Attentional Bias Index (Hypothesis 3a and 3b)**

These calculations are used to determine the “attention capturing” quality of the images (Gotlib et al., 2004). Here, Attentional Bias Index is an indication of the attention-mediated speed of response to images, calculated depending on whether or not the dot-probe is congruent with affective image in question. This score is therefore an index of the speed of attention moving from one type of stimuli to another (MacLeod & Mathews, 1988). The subtraction of RT on congruent trials from incongruent trials is conducted as participants typically respond fastest to probes that appear in a region to which they are attending (i.e. congruent trials; Posner et al., 1980).

A bias away from affective images is inferred when responses on incongruent trials are faster than responses on congruent trials. In this instance, negative (-) values are interpreted as an indication of a shift of attention away from the spatial location of the affective picture, and the further the number is from 0, the greater the bias away from the affective image. Conversely, a bias towards affective images is inferred when responses on incongruent trials are slower than responses on congruent trials. Positive (+) values are interpreted as a shift in attention towards the spatial location of the affective picture relative to the paired (neutral) picture. The further the number is from 0, the greater the bias towards the affective image.

Three attention bias indices can be calculated for each participant, for positive-affective images (Positive-Affective Bias Index), for negative-affective images (Negative-Affective Bias Index), and for any affective image (both positive and negative



## **2.6 Chapter Summary**

The characteristics of the sample and measures used in the present study, in particular the dot-probe task, were described in detail. The assessment and recruitment procedures were described, and management of necessary ethical considerations pertinent to this clinical population were discussed. Of particular significance, the potential distress that could be caused by the images used was highlighted. In preparation for the results in section 3, the necessary data preparation procedures were outlined.

## 3 Results

### 3.1 Chapter Overview

The research questions outlined in chapter one will be investigated. The demographic characteristics of the sample and scores measures are presented initially. Groups will then be compared to explore differences in empathy, RT to different trial types, and overall attentional bias. Finally, the extent to which empathy can be explained by attentional bias will be explored.

### 3.2 Preliminary Data and Analyses

#### 3.2.1 Attrition

As described in section 2.1.2, eight participants who had completed the consent forms were unable to take part in the study. The final sample size used in the analysis was  $n = 66$  (IDO  $n = 34$ ; IDNO  $n = 32$ ).

#### 3.2.2 Sample

Recruitment and support data is shown in Table 8. Of those who took part in the assessment in full, over half of the IDO group were recruited from independent forensic inpatient services ( $n = 21$ ), and the majority of participants were in Medium Secure Units ( $n = 25$ ). One person was recruited from a community ID NHS team, having previously served a sentence in a Medium Secure Unit. The majority of IDNO participants were recruited from day centres ( $n = 17$ ), with roughly a third each of remaining participants being recruited from community ID teams ( $n = 6$ ), residential housing ( $n = 4$ ), and local council facilities ( $n = 4$ ). In the IDNO group, under half had someone present during the consent process ( $n = 13$ ), and less than 10% requested this for the full assessment ( $n = 3$ ). Over half of the IDO group had someone present whilst consent was being taken ( $n = 21$ ), and just under half had someone present throughout the duration of the assessment ( $n = 16$ ).

**Table 8. Recruitment and Support Data, by Group**

	IDO N (%) ( <i>n</i> = 34)	IDNO N (%) ( <i>n</i> = 32)
Recruitment Location		
Community NHS LD Team	1 (2.9)	6 (18.8)
Forensic Inpatient Service - Independent	21 (61.8)	0 (0)
Forensic Inpatient Service – NHS	12 (35.3)	0 (0)
Residential Housing	0 (0)	4 (12.5)
Day Centre	0 (0)	17 (53.1)
County Council	0 (0)	4 (12.5)
College	0 (0)	1 (3.1)
Type of Secure Unit		
Low Secure	7 (20.6)	-
Medium Secure	25 (76.5)	-
N/A (Community)	1 (2.9)	-
Someone Present for Consent		
No	13 (38.2)	19 (59.4)
Yes	21 (61.8)	13 (40.6)
Someone Present for Assessment		
No	18 (52.9)	29 (90.6)
Yes	16 (47.1)	3 (9.4)

### 3.2.3 Descriptive Data

Offence data for the IDO group are shown in Table 9, which includes both the index offence, and all offences recorded on file. All offence data and physical and mental health data were elicited using open ended questions. Categories for analysis were created after data collection based on the sample data, and UK government offence classifications (Department of Justice, 2010) were used to develop offence categories.

**Table 9. Offence Details in the IDO Group**

	N (%)
Violent Offences	
Manslaughter	1 (2.9)
Murder	2 (5.9)
Attempted murder	1 (2.9)
Wounding or other act endangering life	10 (29.4)
Sexual offences	
Sexual assault of a minor	8 (23.5)
Sexual assault of an adult	6 (17.6)
Sexual activity with a minor	6 (17.6)
Rape	1 (2.9)
Abuse of children through pornography	2 (5.9)
Acquisition offences	
Burglary	2 (5.9)
Armed robbery	1 (2.9)
Criminal Damage	
Arson	4 (11.8)
Other	
Other indictable offence	3 (8.8)

Means and standard deviations for the demographic data (ethnicity, relationship status, school type and number of children) are shown in Table 10. Health data (physical health, mental health, and neurodevelopmental disorders) are shown in Table 11. It should be noted that more than one problem was recorded for some participants, and that where sensory problems are reported (sight problems  $n = 2$ , hearing problems  $n = 1$ ), it was ensured that these would not impact on participants ability to complete any aspect of the study. IQ, age, school leaving age, depression, anxiety and empathy scores, are shown in Table 12.

**Table 10. Demographic Data, by Group**

	IDO N (%) (n = 34)	IDNO N (%) (n = 32)	Fisher's Exact Test	Sig
Ethnicity			4.28	.14
White	29 (85.3)	32 (100)		
Asian/Asian British	1 (2.9)	0 (0)		
Black/Black British	2 (5.9)	0 (0)		
Not stated/Other	2 (2.9)	0 (0)		
Relationship status			13.24	*.00
Single	33 (97.1)	22 (68.8)		
Divorced	1 (2.9)	0 (0)		
Married	0 (0)	8 (25.0)		
Living with someone/partner	0 (0)	0 (6.3)		
Children			8.26	*.01
None	26 (76.5)	32 (100)		
One	6 (17.6)	0 (0)		
Two or more	2 (5.9)	0 (0)		
School			6.82	.09
Special needs	22 (64.7)	27 (84.4)		
Mainstream	7 (20.6)	2 (6.3)		
Received extra help	2 (5.9)	1 (3.1)		
Learning support unit	0 (0)	2 (6.3)		
Didn't go to school	2 (5.9)	0 (0)		

*Note.* \* Statistically significant (2 tailed).

**Table 11. Physical and Mental Health Comorbidities, by Group**

	IDO N (%) (n = 34)	IDNO N (%) (n = 32)	Value	Phi	Sig
Physical Health Problems	20 (60.6)	12 (37.5)	2.61	-.23	.11
No	13 (38.2)	20 (62.5)			
Yes	20 (58.8)	12 (37.5)	2.21	-.21	.08
Epilepsy	3 (8.8)	6 (18.8)			
Blood pressure	0 (0)	5 (15.6)			
Diabetes	3 (8.8)	5 (15.6)			
Heart problems	3 (8.8)	3 (9.4)			
Asthma	2 (5.9)	5 (15.6)			
Thyroid problems	0 (0)	2 (6.3)			
Sensory problems	2 (5.9)	1 (3.1)	3.01	-.25	*.04
Other	2 (5.9)	4 (12.5)			
Missing	1 (2.9)	0 (0)			
Mental Health Problems	20 (58.8)	12 (37.5)	2.21	-.21	.08
No	14 (41.2)	20 (62.5)			
Yes	20 (58.8)	12 (37.5)			
Anxiety	10 (29.4)	10 (31.3)			
Depression	9 (26.5)	6 (18.8)			
Personality Disorder	3 (8.8)	0 (0)			
Schizophrenia	5 (14.7)	0 (0)			
Neurodevelopmental Disorders	10 (29.4)	3 (9.4)	3.01	-.25	*.04
No	24 (70.6)	30 (85.7)			
Yes	7 (20.6)	2 (9.4)			
Attention Deficit Hyperactivity Disorder	3 (8.8)	1 (3.1)			
Autistic Spectrum Disorder	7 (20.6)	2 (6.3)			

Note. \* Statistically significant (2 tailed).



### 3.2.4 Preliminary Analyses

A Chi-square test for independence with Yates Continuity Correction indicated no significant association between group and physical health problems,  $\chi^2 (1, n = 66) = 2.61, p = .11, phi = -.23$ ), or mental health problems,  $\chi^2 (1, n = 66) = 2.21, p = .08, phi = -.21$ ). Significant group differences were observed in terms of neurodevelopmental disorders,  $\chi^2 (1, n = 66) = 3.01, p = .04, phi = -.25$ ). Results are reported in Table 11. Where more than 80% of the cells had an expected count of less than five, Fisher's exact test was used. Groups differed significantly in terms of relationship status; significantly more of the IDO group were single, whilst more of the IDNO group were married (Fisher's exact test,  $p = .00$ ), and significantly more of the IDO group had children (Fisher's exact test,  $p = .01$ ). No group differences were noted in ethnicity or type of school attended. Results are reported in Table 10 and 11.

Independent samples t-tests were conducted to compare interval data (Table 12). There were no significant differences in scores between groups in terms of school leaving age,  $t(60) = -.88, p = .38$ ; *BCa* 95% CI [-1.49, .52], IQ  $t(63) = 1.87, p = .07$ , or anxiety,  $t(64) = -.39, p = .70$ . There were significant differences in scores between groups in terms of age and depression, as measured by the GDS. The IDO group were significantly younger ( $M = 33.06, SD = 13.29$ ) than the IDNO group ( $M = 43.47, SD = 14.71$ ),  $t(64) = -3.02, p = .00$ ; *BCa* 95% CI [-16.98, -3.35], and had higher depression scores ( $M = 12.51, SD = 7.08$ ) than the IDNO group ( $M = 8.87, SD = 5.68$ ),  $t(63) = 2.28, p = .03$ . Finally, there were significant differences between groups on overall RT in the dot-probe task. IDNO were significantly slower ( $M = .41, SD = .21$ ) than the IDO group ( $M = .55, SD = .22$ ),  $t(63) = -2.81, p = .01$ ; *BCa* 95% CI [-.26, -.05].

**Table 12. Demographic, Questionnaire and Dot-Probe Analyses, by Group**

	IDO ( <i>n</i> = 34)		IDNO ( <i>n</i> = 32)		BC <sub>a</sub> 95% CI	t	df	Sig
	<i>M</i> ( <i>SD</i> )	Min and Max Value	<i>M</i> ( <i>SD</i> )	Min and Max Value				
Demographic data								
Age (years) <sup>a</sup>	33.06 (13.29)	18–59	43.47 (14.71)	19–65	-16.98–-3.35	-3.02	64	*.00
School leaving age (years) <sup>a</sup>	15.47(1.95)	10–18	15.90 (1.91)	11–19	-1.49–.52	-.88	60	.38
FSIQ	63.42 (4.82)	50–70	61.19 (4.82)	55–69	-	1.87	63	.07
Questionnaire data								
EQ	32.45 (10.74)	15–58	38.16 (9.41)	21–58	-	-2.27	63	*.03
GDS	12.51 (7.08)	0–28	8.87 (5.68)	0–20	-	2.28	63	*.03
GAS	18.61 (8.98)	3–39	19.53 (10.00)	5–40	-	-.39	64	.70
Dot-probe Task (seconds)								
All Trials <sup>a,b</sup>	.55 (.22)	.34–1.2	.71 (.22)	.40–1.35	-.26–-.05	-2.81	63	*.01
Positive-Affective Bias Index <sup>a,b</sup>	-.01 (.07)	-.15–.30	-.05 (.15)	-.38–.39	-.02–.09	1.35	63	.19
Negative-Affective Bias Index <sup>a,b</sup>	.01 (.08)	-.16–.22	-.08 (.19)	-.67–.33	.02–.16	2.41	63	*.02
Global-Affective Bias Index <sup>a</sup>	.00 (.07)	-.14–.26	-.06 (.16)	-.40–.36	.00–.12	2.12	63	*.04

Note. FSIQ = Full Scale IQ, EQ = Empathy Quotient, GDS = Glasgow Depression Scale, GAS = Glasgow Anxiety Scale, \* Statistically significant (2 tailed). <sup>a</sup> Bootstrapped data. <sup>b</sup> Equal variances not assumed.

### 3.3 Main Analyses

#### 3.3.1 Research Question 1

Do IDO have lower empathy than IDNO?

*Hypothesis 1: The IDO group will have significantly lower scores on the Empathy Quotient questionnaire than the IDNO group.*

Tests were carried out to investigate whether IDO have significantly lower empathy than IDNO, as measured by the EQ. Independent samples t-tests revealed the IDO group had significantly lower EQ scores ( $M = 32, SD = 10.74$ ) than the IDNO group ( $M = 38, SD = 9.41$ );  $t(64) = -.39, p = .03$ , supporting the hypothesis. Results are shown in Table 12.

#### 3.3.2 Research Question 2

Do IDO and IDNO groups have a bias for different types of image?

*Hypothesis 2a: There will be no differences in RT when comparing negative-affective, positive-affective and global-affective (both positive and negative) trials, to neutral only trials, in the IDO group.*

*Hypothesis 2b: On the above trials, there will be significant differences in RT in the IDNO group.*

In order to understand whether IDO, and IDNO, differed in their RT to affective images in comparison to neutral images, paired samples t-tests were used to compare affective and neutral times, for each group (i.e. trials where there were two neutral images presented were compared to trials where an affective and a neutral image was presented). In the IDO group, results revealed that IDO had no significant differences on Neutral-Neutral trial RT times, in comparison to any of the trial types: Negative Congruent,  $t(32) = -.34, p = .73, BC_a$  95% CI [-.04, .02], Negative Incongruent,  $t(32) = .37, p = .71, BC_a$  95% CI [-.01, .01], Positive Congruent,  $t(32) = .33, p = .71, BC_a$  95%

CI [-.02, .02], Positive Incongruent,  $t(32) = -.39, p = .70, BC_a$  95% CI [-.01, .00], Global-Affective Congruent,  $t(32) = -.03, p = .98, BC_a$  95% CI [-.03, .03], or Global-Affective Incongruent trials,  $t(32) = .04, p = .97, BC_a$  95% CI [-.00, -.01]. This suggests that irrespective of the content of the stimulus, IDO RT do not differ, and confirms hypothesis 2a (Table 13).

Across the IDNO group, significant findings were observed between Neutral-Neutral trials and all other trial types, confirming hypothesis 2b. RT on congruent trials were all significantly slower than RT on Neutral-Neutral trials ( $M = .59, SD = .19$ ): Negative Congruent ( $M = .72, SD = .28, t(31) = 3.29, p = .00, BC_a$  95% CI [.05, .20], Positive Congruent ( $M = .66, SD = .22, t(31) = 2.47, p = .02, BC_a$  95% CI [.01, .12] and Global-Affective Congruent ( $M = .69, SD = .24, t(31) = 3.11, p = .00, BC_a$  95% CI [.04, .16].

If the position of the dot-probe, relative to the affective stimuli (i.e. congruency) exerts no influence on the RT, the score is zero, therefore the greater the score is from zero, the more substantial the bias in attention. Vigilance for affective stimuli threat is indicated by faster responses on Congruent trials compared to Neutral-Neutral trials, which suggests that individuals preferentially hold their attention at the affective location (Koster et al., 2004). The current results do not indicate vigilance for affective stimuli; instead, IDNO took significantly longer to respond to Congruent trials than neutral trials. RT on incongruent trials in the IDNO group were all significantly slower than RT on neutral trials: Negative Incongruent ( $M = .64, SD = .22, t(31) = 3.04, p = .01, BC_a$  95% CI [.02, .08], Positive Incongruent ( $M = .61, SD = .21, t(31) = 2.36, p = .03, BC_a$  95% CI [.00, .04] and Global-Affective Incongruent ( $M = .63, SD = .21, t(31) = 3.08, p = .00, BC_a$  95% CI [.01, .06]. These results suggest that IDNO had difficulty

disengaging attention from all affective stimuli, as mean RT are slower on incongruent trials (in comparison to Neutral-Neutral trials).

**Table 13. Affective/Neutral Trials Analyses, by Group**

	IDO ( <i>n</i> = 34)					
	<i>M</i> ( <i>SD</i> )	Min and Max Value	BCa 95% CI	<i>t</i>	<i>df</i>	Sig
Neutral-Neutral, compared to:						
Negative Congruent	.52 (.22)	.30–1.14	-.04–.02	-.34	32	.73
Negative Incongruent	.53 (.21)	.33–1.20	-.01–.01	.37	32	.71
Positive Congruent <sup>a</sup>	.53 (.20)	.33–1.19	-.02–.02	.33	32	.75
Positive Incongruent <sup>a</sup>	.52 (.22)	.30–1.20	-.01–.00	-.39	32	.70
Global-Affective Congruent	.52 (.21)	.33–1.16	-.03–.03	-.03	32	.98
Global-Affective Incongruent	.52 (.22)	.32–1.20	-.01–.01	.05	32	.96
Neutral – Neutral Only	.52 (.23)	.31–1.23	-	-	-	-
IDNO ( <i>n</i> = 32)						
Neutral-Neutral, compared to:						
Negative Congruent	.72 (.28)	.30–1.44	.05–.20	3.29	31	*.00
Negative Incongruent	.64 (.22)	.30–1.26	.02–.08	3.04	31	*.01
Positive Congruent <sup>a</sup>	.66 (.22)	.26–1.33	.01–.12	2.47	31	*.02
Positive Incongruent <sup>a</sup>	.61 (.21)	.23–1.22	.00–.04	2.36	31	*.03
Global-Affective Congruent	.69 (.24)	.28–1.36	.04–.16	3.11	31	*.00
Global-Affective Incongruent	.63 (.21)	.26–1.24	.01–.06	3.08	31	*.00
Neutral-Neutral Only	.59 (.19)	.26–1.22	-	-	-	-

*Note.* Congruent = probe in same location as affective picture; incongruent = probe in different location than affective picture.  
\* Statistically significant (2 tailed). <sup>a</sup> Equal variances not assumed.

To reduce the possibility of Type I errors as a consequence of multiple simultaneous comparisons, post-hoc comparisons were conducted on the results that reached statistical significance. The Bonferroni method is commonly used (Tabachnick & Fidell, 2001), but has been argued to be overly conservative (Cabral, 2008). Holm's adjustment of the *p* value was selected, as this maintains the experimentwise error rate at  $\alpha$  (Wright, 1992). In Holm's method (Holm, 1979), the *p* values ( $p_i$ ) are ordered smallest to largest and numbered (*i*). A Holm adjusted *p* value ( $p_{Holm}$ ) can then be calculated using the following formula:  $\alpha / (n - i + 1)$ , and where  $p_i$  values are the same,  $p_{Holm}$  also remains the same. Adjusted *p* values are then compared to the original *p*

value, and where  $p_i$  is less than  $p_{\text{Holm}}$ , the null hypothesis can be rejected and the experimental hypothesis can be accepted. When comparing the inferential statistics found in Table 13 with the adjusted  $p$ -values, all results remained significant (see Table 14).

**Table 14. Holm’s Adjusted  $p$  Values for Multiple Comparisons**

	$i$	$p_i$	$p_{\text{Holm}}$	Null Hypothesis ( $H_0$ )
Negative Congruent	1	.00	.01	Rejected
Global-Affective Congruent	2	.00	.01	Rejected
Global-Affective Incongruent	3	.00	.01	Rejected
Negative Incongruent	4	.01	.02	Rejected
Positive Congruent	5	.02	.03	Rejected
Positive Incongruent	6	.03	.05	Rejected

*Note.*  $p_i$ : Unadjusted  $p$  value;  $p_{\text{Holm}}$ : Holm’s adjusted  $p$ -value.

### 3.3.3 Research Question 3

Are there differences between groups in attentional bias for affective information?

*Hypothesis 3a: IDO will have a significant attentional bias for negative stimuli, in comparison to the IDNO group, controlling for relevant factors (age, IQ, anxiety and depression if appropriate).*

*Hypothesis 3b: There will be no group differences in attentional bias for positive-affective stimuli, or global-affective stimuli.*

Given previous literature (Demeyer & De Raedt, 2013; Gotlib et al., 2004; Jolliffe & Farrington, 2004; Lorenz & Newman, 2002a), age, IQ, anxiety and depression were considered appropriate for covariates in this analysis. Assumptions for this analysis were met; in particular, Appendix 18 shows data demonstrating the assumption of homogeneity of regression slopes was not violated. However, the assumption of

homogeneity of variance was violated for both age and IQ (Levene's Test  $p = .01$ ). Furthermore, correlational analysis suggested none of these variables significantly correlated with any of the attentional bias indices (see Appendix 19). Independent samples t-tests were therefore conducted (Table 12), and age, IQ, anxiety and depression were not used as covariates in the analysis.

Considering hypothesis 3a, results indicated that the IDO group had no attentional bias towards negative stimuli ( $M = .01$ ,  $SD = .08$ ), whereas the IDNO Group had an attentional bias away from negative stimuli ( $M = -.08$ ,  $SD = .19$ ),  $t(63) = 2.41$ ,  $p = .02$ ;  $BC_a$  95% CI [.02, .16], equal variances not assumed. Although the findings indicate that IDO group do not have a bias towards negative stimuli, the fact that the IDNO group has a negative (-) Negative-Affective Bias Index, is consistent with the direction of the hypothesis. Considering whether the IDNO Group had an attentional bias towards positive stimuli, there was no significant difference between the two groups on the Positive-Affective Bias Index,  $t(63) = 1.35$ ,  $p = .19$ ;  $BC_a$  95% CI [-.02, .09], equal variances not assumed). This is consistent with hypothesis 3b, meaning that the two groups did not respond differently to positive stimuli. However, contrary to the hypothesis, there were significant group differences on the Global-Affective Bias Index,  $t(63) = 2.12$ ,  $p = .04$ ;  $BC_a$  95% CI [.00, .12]. The IDO group had no attentional bias for global-affective, yet the IDNO group had a negative (-) Global-Affective Bias Index ( $M = -.06$ ,  $SD = .16$ ).

#### **3.3.4 Research Question 4**

Can attentional bias predict empathy?

*Hypothesis 4: Attentional bias for global-affective, negative-affective and positive-affective stimuli will be significant predictors of empathy, controlling for relevant factors (age and IQ) if appropriate.*

The final research question was to examine whether attentional bias for affective information was a significant predictor of empathy, after controlling for the influence of age and IQ. Hierarchical multiple regression was used to assess whether Global-Affective Bias Index ( $M = -.03$ ,  $SD = .12$ ), Negative-Affective Bias Index ( $M = -.04$ ,  $SD = .15$ ), and Positive-Affective Bias Index ( $M = -.03$ ,  $SD = .12$ ) could predict empathy. It is recommended that hierarchical multiple regression analyses are performed with a minimum of fifteen participants per predictor, or more if the data is skewed (Stevens, 1996). Preliminary analyses were conducted, ensuring that additional assumptions of linearity and homoscedascity were met. Regression analysis requires data to adhere to assumptions of multicollinearity and singularity, however correlational analysis revealed, as anticipated, a high degree of correlation between all attentional bias variables. In addition, the nature of the Global-Affective Bias Index calculation is that it violates the singularity assumption. Separate regression analyses were therefore run with each Attentional Bias Index.

For the first regression, all three models were unable to explain a significant proportion of the variance in empathy (Table 15): Model 1 (age),  $F(3, 62) = .44$ ,  $p = .51$ , Model 2 (age and FSIQ),  $F(3, 62) = 2.55$ ,  $p = .09$ , and Model 3 (age, FSIQ and Global-Affective Bias Index),  $F(3, 62) = 1.71$ ,  $p = .18$ . In the second regression (Table 16), Models 1 and 2 remained unchanged, and Model 3 (age, FSIQ, and Negative-Affective Bias Index), was not significant,  $F(3, 62) = 1.67$ ,  $p = .18$ . Similarly, in the third regression (Table 17), none of the models were able to explain a significant proportion of the variance in empathy: Models 1 and 2 remained unchanged, and Model 3 (age, FSIQ, and Positive-Affective Bias Index), was not significant,  $F(3, 62) = 1.83$ ,  $p = .15$ . Overall, there was no support for hypothesis 4.

### **3.3.5 Chapter Summary**



Descriptive data showed the groups to broadly be similar in terms of IQ, school leaving age, and physical and mental health problems, however there were significant differences in terms of diagnoses of neurodevelopmental disorders. The main analyses revealed that IDO have significantly lower empathy scores than the IDNO group. IDNO had difficulties in disengaging from all types of affective stimuli, and IDO showed no differences in the way they attended to information, exhibiting no vigilance or disengagement effects. When comparing groups, IDO did not have an attentional bias towards negative stimuli or global-affective stimuli (both positive and negative stimuli), but the IDNO group had an attentional bias away from these images. Across stimuli, attentional bias for affective information was unable to predict empathy.

**Table 15. Hierarchical Regression One: Global-Affective Bias**

	B (St. Error)	beta	t	Adjusted R square	R Square Change	F	Sig	BCa 95% CI
Model 1				-.01	.01	.44	<sup>a</sup> .51	
Age	.06 (.09)	.09	.67	-	-	-	.49	-.11-.23
Model 2				.05	.07	3.55	<sup>b</sup> .09	
Age	.06 (.09)	.08	.67	-	-	-	.50	-.11-.22
FSIQ	-.56 (.26)	-.26	-2.15	-	-	-	*.05	-1.11-.03
Model 3				.03	.00	1.71	<sup>c</sup> .18	
Age	.06 (.09)	.09	.36	-	-	-	.48	-.12-.23
FSIQ	-.56 (.26)	-.26	-2.09	-	-	-	*.05	-1.11-.01
Global-Affective Bias Index	3.46 (10.56)	.04	.33	-	-	-	.69	-19.04-18.44

Note. FSIQ = Full Scale IQ. <sup>a</sup> Predictors: Age. <sup>b</sup> Predictors: Age, FSIQ. <sup>c</sup> Predictors: Age, FSIQ, Bias Index. \* Statistically significant (2 tailed).

**Table 16. Hierarchical Regression Two: Negative-Affective Bias**

	B (St. Error)	beta	t	Adjusted R square	R Square Change	F	Sig	BCa 95% CI
Model 1				-.01	.01	.44	<sup>a</sup> .51	
Age	.06 (.09)	.09	.67	-	-	-	.49	-.11-.23
Model 2				.05	.07	2.55	<sup>b</sup> .09	
Age	.06 (.09)	.09	.67	-	-	-	.50	-.11-.23
FSIQ	-.56 (.26)	-.27	-2.15	-	-	-	*.05	-1.13-.03
Model 3				.03	.00	1.67	<sup>c</sup> .18	
Age	.06 (.09)	.08	.67	-	-	-	.47	-.10-.24
FSIQ	-.54 (.26)	-.27	-2.13	-	-	-	.07	-1.12-.03
Negative-Affective Bias Index	.11 (8.60)	.00	.01	-	-	-	.36	-10.02-24.69

Note. FSIQ = Full Scale IQ. <sup>a</sup> Predictors: Age. <sup>b</sup> Predictors: Age, FSIQ. <sup>c</sup> Predictors: Age, FSIQ, Bias Index. \* Statistically significant (2 tailed).

**Table 17. Hierarchical Regression Three: Positive-Affective Bias**

	B (St. Error)	beta	t	Adjusted R square	R Square Change	F	Sig	BCa 95% CI
Model 1				-.01	.01	.44	<sup>a</sup> .51	
Age	.06 (.09)	.09	.67				.49	-.11-.23
Model 2				.05	.07	2.55	<sup>b</sup> .09	
Age	.06 (.09)	.09	.67				.50	-.11-.23
FSIQ	-.56 (.26)	-.26	-2.15				*.05	-1.12-.03
Model 3				.03	.01	1.83	<sup>c</sup> .15	
Age	.06 (.09)	.09	.67				.48	-.10-.23
FSIQ	-.54 (.26)	-.25	-2.02				.07	-1.10-.02
Positive-Affective Bias Index	7.44 (11.04)	.09	.67				.34	-9.91-23.15

Note. FSIQ = Full Scale IQ. <sup>a</sup> Predictors: Age. <sup>b</sup> Predictors: Age, FSIQ. <sup>c</sup> Predictors: Age, FSIQ, Bias Index. \* Statistically significant (2 tailed).

## **4 Discussion**

### **4.1 Chapter Overview**

The final chapter explores the results of this study. It opens with a discussion of the research findings, in the context of the existing literature, explained in three parts; empathy, attentional bias, and the relationship between empathy and attentional bias. A critique of the methodological issues pertinent to this study will then be considered, and the impact this has on the interpretation of the results is detailed. This is followed by consideration of the theoretical and clinical implications of the study. Bringing together these ideas, possible adaptations to the design and areas for future research will be discussed. The chapter closes with a conclusion and summary of the thesis.

### **4.2 Discussion of Findings**

#### **4.2.1 Empathy**

Deficits in empathy are hypothesised to have an association with offending behaviour. Previous research in IDO have reported different relationships between offenders and empathy; in studies of IDO, participants have variously been found to have higher scores (Proctor & Beail, 2007; Ralfs & Beail, 2012), lower scores (Hockley & Langdon, In Press) and similar scores (Langdon et al., 2011) to IDNO participants on measures of empathy. In support of the theoretical relationship, and hypothesis one, it was observed that IDO had lower levels of empathy than IDNO, as measured by the EQ.

Considering these studies together, it appears that, similar to the evidence base in non-ID offenders, the role of empathy in the IDO population is equivocal. As discussed in chapter one, a large part of this is likely to be associated with methodological problems. For example, previous evidence has suggested that in addition to low IQ, socio-economic status has a significant mediating effect on the relationship between empathy and offending

(Jolliffe & Farrington, 2004), yet none of the studies, including the present investigation, controlled for this.

There are also conceptual and methodological differences. Assessment tools have either been specifically designed for people with ID (the Test of Emotional Perception; Negri-Shoultz & Donnellan, 1989), adapted from existing versions of measures that are used for children (the Bryant Empathy Index; Bryant, 1982), or adult measures with simplified concepts and wording (Interpersonal Reactivity Index; Davis, 1980), creating much inconsistency in the overall approach to measurement. The internal consistency scores in these studies have either not been reported (Proctor and Beail, 2007; Ralfs and Beail, 2012), or were “questionable” ( $\alpha = .64$ ; Langdon et al., 2011). It is interesting to note that internal consistency of the EQ in the current study is much higher than in a similar study by Hockley and Langdon (In Press), however this may be explained by the fact that present study made use of a visual analogue scale to aid responses, which could have helped to mitigate some of the problems associated with using a measure with complex wording.

#### **4.2.2 Attentional Bias**

Whilst there is a robust evidence base outlining the types of stimuli to which certain populations have an attentional bias (e.g. threat-based stimuli in people with anxiety, Bar-Heim et al., 2007), the limited study of attentional bias in offenders has explored a number of different stimuli types – offence specific stimuli such as aggressive words or pictures of children, and more general stimuli such as affective words. Given the preliminary nature of this investigation in this population, and the fact that IDO who had committed a range of offences were recruited to the study, research question two sought to explore whether IDO and IDNO had an attentional bias for different categories of affective stimuli: positive-

affective images, negative-affective images, and global-affective (both positive and negative) images, in comparison to neutral images. Results showed that irrespective of the type of image, IDO had virtually identical RT across the trials. There were hence no observable vigilance or disengagement effects on any of the trial types, suggesting that IDO do not process negative affective information any differently to positive or neutral affective stimuli.

Conversely, IDNO showed much more variation in their RT, related to the type of image to which they were responding. The largest difference observed was that between Negative Incongruent trials and Neutral-Neutral trials. Results showed that when the negative image was incongruent with the position of the probe, their RT were slowest, and this was significantly slower than their standard RT on Neutral-Neutral trials. According to Koster et al. (2004), this indicates that they had difficulty disengaging their attention from the stimuli. It is likely that on the negative trials, this was because the content of the image was perceived as shocking or distressing, and as such, captured their attention more than that of a neutral image, which by contrast, has no particular salience or interest.

The same pattern of findings was observed with Positive Incongruent trials. Similarly, this shows that IDNO experienced difficulty disengaging their attention from these images, though in this case, it is more likely that these images captured attention because they were enjoyable or rewarding. Overall, the same pattern of findings was therefore observed when the positive- and negative-affective trials were combined. This shows that attention in IDNO is influenced by affective images; specifically that affective information interrupts information processing. It can be hypothesised that in part, this contributes to a lack of offence behaviour in this group, as neutral, images are attended to differently than positive and negative images, and so this may be associated with different

types of behavioural response. Furthermore, these findings refute the idea that the categorical negativity theory, which suggest that only negative stimuli initially influence attention (Pratto & John, 1991).

Taken together, within-group differences can be seen in terms of how IDO and IDNO process affective, external information. Attentional theories, such as that by Kahneman (1972), argue that our attention can then be guided or focused according to what is salient or important to us, particularly when the observed stimuli is arousing. Results indicated the image content had varying influence on attentional allocation; they suggest that IDNO group find it harder to disengage their attention from affective images, whilst no attentional differences were seen in response to affective or neutral images in the IDO group. If these results are taken to suggest that attention in the IDO group is comparatively unaffected by affective information (i.e. they are neither hypervigilant for this stimuli, nor struggle to disengage from it), and that this is atypical in comparison to the observations noted in the IDNO group, it can be hypothesised that this may be associated with engagement in offence behaviour.

The results of the current study are insufficient to elucidate the precise mechanisms by which this relationship might occur, but it can be hypothesised that if IDO do not attend to affective stimuli differently to neutral stimuli, they may not be able to perceive differences in the contents of the stimuli (affect recognition), and hence may not then experience subsequent differences in affective responses. To date, two studies in IDO have examined this, and current data would not support this idea; sex offenders were found to have similar emotion recognition abilities to IDNO (Ralfs & Beail, 2012), and IDO (type not specified) had results in the opposite direction; that is, they had superior emotion recognition abilities when compared to (Proctor & Beail, 2007). Whilst both studies used



the same measure of emotion perception that can be considered to be ecologically valid, it can be argued to be a very narrow assessment of emotion recognition based on only a few responses by the participant. Thus, in order to confirm or refute this hypothesis, further work would be needed to examine emotion recognition in this population, and to consider how this relates to attentional differences to different types of stimuli. An alternative hypothesis could be that IDO have differences in their autonomic responses to affective and non-affective information, for example, their arousal threshold may be lower when viewing affective information. This pattern has been observed in non-IDO, using methods to measure autonomic nervous system response such as galvanic skin conductance (Guarino-Ghezzi & Treviño, 2005), but as yet, has not been investigated in IDO populations. Such information would provide important evidence in fleshing out the hypothesised differences between offenders and non-offenders.

The vigilance/disengagement analysis used here has previously been cited as being able to distinguish vigilance for stimuli from disengagement, however other authors have offered alternative interpretations. For example, increased RT on affective compared to neutral trials can be seen as a response slowing effect (Mogg, Holmes, Garner, & Bradley, 2008), that is, novel or threatening images can activate a behavioural inhibition system, which serves to interrupt information processing and behavioural responses (Gray, 1982). Mogg et al. (2008) also suggests that slowed RT could reflect participant's experience of task-related cognitions associated with the affective content of the images, which would be competing for limited cognitive resources. More than likely, multiple, simultaneous explanations may be relevant in explaining these findings, but it is clear that the current findings are insufficient to offer firm conclusions. Methods such as eye movement detection paradigms, would be needed to definitively determine whether results are

indicative of a vigilance for stimuli, difficulty with disengagement, or an alternative attentional process.

Attentional bias as described in the literature in clinical populations is observed when incongruent and congruent trials are compared on particular trial types e.g. negative-affective trials. Using this methodology, research question three aimed to determine whether offenders have an attentional bias towards or away from affective stimuli. Results revealed that there were significant differences on the Negative-Affective and Global-Affective Bias Index between groups, which suggests that IDO and IDNO differ in the way in which they process negative-affective stimuli, and affective stimuli more generally. On both indices, IDO did not have an attentional bias for these stimuli, but in contrast, IDNO had a negative (-) bias score on both indices, indicating that their attention was biased away from the affective image.

Given that these findings were observed for the negative, but not for the positive index, this offers support for the categorical negativity hypothesis (Pratto & John, 1991); a substantial component of attentional allocation is guided by valence, and stimuli with undesirable content can elicit particular attention effects in comparison to other types of stimuli. The current findings indicate that individuals who engage in offending behaviour are unaffected by the presence and processing of negative-affective material, but that negative information has an interference effect on the attentional processes of IDNO. The effect of negative stimuli on attention has also been observed in other groups, but more commonly, the attentional bias has been seen in the clinical population. For example, in people with anxiety disorders, a pronounced attentional bias (i.e. substantial deviance from zero) towards salient stimuli is observed, whilst controls have no attentional bias for these images, and in an offender versus a non-offender population (Smith & Waterman, 2003).

As these are the first findings of this kind in people with ID, results at this stage cannot elucidate the underlying mechanism responsible for these effects. However, it could be hypothesised that inattention to negative stimuli may serve a 'homeostatic function' in the IDO group, whereby the salience and interest in such stimuli remains relatively constant. Alternatively, it may be that negative valence images distinguish IDNO from IDO as they are perceived by the IDNO group as more pertinent or threatening to survival (Öhman, 1993), and so need to be avoided. Such attentional allocation would be congruent with the behavioural differences seen in these groups; IDO engage in externalised behaviours that are perceived as threatening, whereas IDNO may avoid confrontation or challenging interpersonal interactions.

Contrary to the hypothesis, it is interesting to see a similar pattern of findings in terms of attentional bias to all types of affective stimuli (global-affective). One explanation for this is that the negative attentional bias findings are responsible for driving this effect. However, the results may also indicate that IDO and IDNO have a quantitatively different way of processing affective information in general, but that positive images alone are insufficient to distinguish attentional differences. Although this is a novel finding within offending populations broadly, it is not illogical; all humans are predisposed to selectively attend to emotional or affective stimuli (Lang, 2000; LeDoux, 1996), and affective information of all types influence behavioural responses (Hoffman, 2000). Group differences may hence be due to alternate ways that general affective information activate schema, and/or differences in the neural systems of networks associated with affect (Bower, 1981; Garrigan & Langdon, In Press). Future investigation broadening the stimuli used in the tasks will be of considerable benefit.

It is interesting to consider these findings in the context of attentional bias studies in non-ID offenders. The majority of the findings from the systematic literature review showed significant differences in attentional bias between groups. Together with the current findings, this lends support to the idea that irrespective of the type of task used, the precise nature of the affective/salient stimulus, and whether or not the offender has an ID, there is evidence to suggest that the phenomenon of attentional bias for salient stimuli exists in offenders, and can be measured. Furthermore, these studies have examined attentional bias across offender types, and it is positive to see that even with this degree of heterogeneity, significant findings can be observed. In the only previous study examining attentional bias in offenders with ID who had committed sex offences (Watson, 2006), no differences in attentional bias were found when using sexual stimuli. However, this study was likely underpowered (ID child sex offenders  $n = 17$ ; IDNO  $n = 18$ ), and so the current study suggests that with an adequate sample size, significant differences between IDO and IDNO can be detected.

#### **4.2.3 Attentional Bias and Empathy**

Previous research has established that age and IQ have a significant relationship with empathy (Carstensen et al., 2000; Jolliffe & Farrington, 2004), and the final part of this investigation examined whether, controlling for these factors, attentional bias was able to predict any of the variance in empathy across ID and IDO. Results indicated that none of the attentional bias indices were significantly related to empathy.

Models of empathy that identify multiple, sequential components offer a process view of how an empathic response is generated, and a number of authors posit that encoding of affective information is the first in a number of stages of empathy (Garrigan & Langdon, In Press; Preston, 2007; Proctor & Beail, 2007). However, the current findings

are contrary to the hypothesis and theoretical relationship between these constructs. It may be that this finding is associated with the way in which these factors were measured, however given that significant findings were observed for the previous hypotheses, this is unlikely. A more likely explanation is perhaps that attentional bias comprises a very small component of these constructs, and hence, the extent to which it can directly explain any variance in empathy is minimal. Alternatively, it may be that the sample size was insufficient to detect group differences (discussed further in section 4.3.2).

#### **4.2.4 Section Summary**

The current findings suggest that IDO had significantly lower global empathy than the IDNO group. IDO showed no differences in RT to different trial types, suggesting that, irrespective of the content of stimuli, their attention allocation to stimuli did not change, whilst IDNO were significantly slower on affect trials than on neutral trials, and appeared to have difficulties disengaging from the stimulus. IDNO also had a significant attentional bias away from negative stimuli and global affective stimuli in comparison to IDO. Overall, attentional bias for affective stimuli was unable to explain any of the variance in empathy. These findings must be considered in the context of a number of methodological considerations, which will now be discussed.

### **4.3 Methodological Considerations**

#### **4.3.1 Ethical Considerations**

The overseeing ethics committee had requested a report following the recruitment of the first ten participants, in order to ensure that the study caused no undue harm or distress as a result of the images presented in the dot-probe tasks. Of the first 10, and total 64 participants who completed the study, no distress was observed in any of the participants, or reported during the debriefing at the end of the study. Furthermore, follow

up conversations with the staff that had identified the participants for the study revealed no longer term effects of participation.

### **4.3.2 Sample**

#### **4.3.2.1 Generalisability**

In order to ascertain the generalisability of the findings, it is necessary to consider how representative the study sample is of the population from which it is drawn. The nature of research of this type is that a number of factors meant that sample selection was not random. Participants were recruited primarily from services that were supportive of research, and were identified from their peers as being potentially suitable, both in terms of meeting inclusion criteria, and assumed willingness to participate. Furthermore, in secure services, participants who were deemed too risky to complete the assessment were automatically excluded.

Within both groups, informal discussions with staff that were responsible for identifying participants also highlighted that a number of people whom they believed met the inclusion criteria declined finding out more information about the study and taking part, when they were approached. It is not possible to know whether the inclusion of these individuals would influence the findings in any way, although in the IDO group it may be that they had different perspectives or insight into their offending behaviour, and so may have exhibited differences in empathy or attention bias. However, a key strength to the study design is that offenders of all types were included in the research. This reflects the general forensic ID population, and prevents participants from being excluded because they have committed more than one type of offence, which would create an artificial, unrepresentative study sample.

#### **4.3.2.2 Participation Criteria**

Inclusion criteria aimed to balance the need for a generalisable sample with the overall hypotheses and methodologies, and recruitment practicalities. Only men were included in the sample as the population of people with ID in forensic settings is predominantly male. In addition, there is evidence to suggest that there are sex differences in the way in which people respond to affective stimuli; both in terms of neural activity (Kemp, Silberstein, Armstrong, & Nathan, 2004) and behavioural responses (Bradley, Codispoti, Sabatinelli, & Lang, 2001). It is of interest to note that in anxious populations, women and men differ in terms of vigilance and disengagement to threat stimuli, which suggests that sex studies in IDO may offer some useful insights into differences in information processing in the future (Tan et al., 2011).

A limitation to this study is that only ID non-offenders were recruited as a control group. In the ID literature, matching ID participants to non-ID participants is not ideal, given that differences in cognitive skills, by definition, significantly skews the groups. Some studies (e.g. Dodd & Porter, 2010) compensate for this by using age matched participants. However, these are typically children, and the nature of this investigation means it would have been difficult to establish an appropriate offender control group. Other studies have used an “attentional control” comparison group; that is, participants matched on a measures of general measures of attention (Dodd & Porter, 2011), and this may be worth further consideration.

#### **4.3.2.3 Equivalence Between Groups**

Groups showed no statistical differences in terms of presence of physical health problems or mental health problems. However, there were group differences in terms of depression, as measured by the GDS, which highlight that it can be helpful to triangulate

self-report and clinical records data with formal data collection measures. There was also a significant difference between groups in terms of neurodevelopmental disorders; participants in the IDO group had more diagnoses of Attention Deficit Hyperactivity Disorder. There may also have been undiagnosed neurodevelopmental disorders or mental health problems in the sample, though this could have been in either group. The attention difficulties observed in people with Attention Deficit Hyperactivity Disorder (ADHD) are well established, and people with ADHD often have difficulty focusing their attention on salient information and filtering out distracting stimuli, and make responses more impulsively (Brown, 2013). It is therefore possible that these findings may have confounded the results. There is no evidence to suggest that this is specific to certain types of stimuli, and so it is likely this would have contributed to the overall difference in RT between groups, rather than to attentional bias scores for specific stimuli types.

In people with Autistic Spectrum Disorder (ASD), the evidence for different attentional processes is equivocal; some research has found people with ASD to preferentially attend to social information (Fletcher-Watson, Leekam, Findlay, & Behan, 2008), whereas other studies have found social attention to be equivalent between groups (Speer, Cook, McMahon, & Clark, 2007). Although the focus of this study was not on social stimuli, the social content of images was controlled for in the design, and so it is hoped this will have minimised any differences between the small number of participants with a diagnosis of ASD, and those without.

However, group differences in ASD may have impacted upon group differences in empathy. People with ASD are thought to have poorer empathic abilities than people without ASD (Hollander, Kolevzon, & Coyle, 2010). On the EQ, people with ASD are reported to have lower empathy scores than age matched controls (Baron-Cohen and



Wheelwright, 2004), and on the Interpersonal Reactivity Index, people with an ASD score lower on measures of cognitive empathy and theory of mind (Rogers, Dziobek, Hassenstab, Wolf, & Convit, 2007). However, in the same study they score higher on items related to “personal distress”, and were equivalent on empathic concern. Furthermore, some research suggests that ASD traits are not associated with a reduced or enhanced ability to resonate with the emotions of another person (Lockwood, Bird, Bridge, & Viding, 2013), and that, although they may have difficulties with perspective taking, the ability to express concern and compassion is present. Whilst the evidence is mixed, it is possible that differences in empathy may have contributed to the findings in hypothesis one, and future research would likely benefit from incorporating this factor as part of the exclusion criteria.

A further important difference between the two groups in the present study is age; IDNO were significantly older than IDO. In the literature, there is considerable evidence to suggest that goals become more affect-driven with age (e.g. Carstensen et al., 2000), and evidence suggests that a shift towards more emotion driven goals will lead to similar changes in information processing. A number of studies of attentional bias suggest that older adults are slower to respond to probes congruent with the presentation of sad or angry faces (Mather & Carstensen, 2005; Steinmetz, Muscatell, & Kensinger, 2010). Although this pattern is seen in the present study, it is observed irrespective of trial type, and correlational analyses revealed no relationships between age and attentional bias indices. It therefore seems more appropriate to consider group differences in light of the fact that RT typically become slower and more variable with age (Fozard, Vercruyssen, Reynolds, Hancock, & Quilter, 1993), and emphasises the need for groups to be age matched as far as is practicable.

Finally, it is regrettable that other factors that may affect attentional bias and empathy could not be measured. For example, attentional bias for abuse related stimuli has been observed in both forensic and non-forensic samples (Blake & Weinberger, 2006; Domes et al., 2013). Such a bias may resonate with some of the negative images used in the study, and is of particular significance as a considerable percentage of sex offenders report having been a victim of crime (Edgar & O'Donnell, 1997; McMackin, Leisen, Cusack, LaFratta, & Litwin, 2002). It may therefore have been helpful to be aware of any personal experiences of sexual and non-sexual abuse or assault in the sample, however, there are clearly ethical issues surrounding obtaining such information in this context.

Another variable that would have been beneficial to measure would have been socio-economic status, as previous evidence suggests this has an important role in understanding the differences between offenders and non-offenders (Jolliffe & Farrington, 2004). However, measures of socio-economic status are often complex, and rely on access to detailed information about the participants personal and parental circumstances e.g. job type, education etc. In the current study, participants would have broadly been unable to provide this information, and most recruitment locations would not have access to information of this nature.

#### **4.3.2.4 Treatment**

Due to anticipated difficulties in obtaining insufficient and incomplete records, the profile of the IDO group in terms of their current or previous offence related treatment was not recorded. However, it should be noted that engagement with offender treatment programmes may have influenced response on the dot-probe task, by altering the attentional bias for negative images (through attention increasingly being drawn away from the image). The study inclusion criteria meant that IDO participants were all detained using

the Mental Health Act, and the one person recruited from the community had previously been detained (under s. 37), and so the majority of participants will have likely attended a minimum of one offender treatment programme. It is therefore positive to note that significant differences in attentional bias for negative stimuli were observed even in the context and thus it is likely that a Type I error (incorrectly accepting that this experimental hypothesis is true) did not occur.

A limitation of this study is that details regarding current medications were not obtained. Although there were no differences between groups in terms of mental health problems, the range of mental health conditions in each group may have meant there were differences in prescribed medications, and there may also have been differences between groups in terms of pharmacological treatment of ADHD. Future studies would benefit from recording this information, and controlling for this where appropriate.

#### **4.3.2.5 Sample Size**

Sample size is calculated based on previous research in the area, and requires estimates of the size of the anticipated effect and the expected variability in this assessment, in addition to an alpha level and desired power (Tabachnick & Fidell, 2001). It is acknowledged that a lack of published studies using the dot-probe paradigm in people with ID and IDO meant that estimates for this study largely could not be based on previous data, and where previous data was available, it was not directly comparable to the current questions under investigation. Largely, the findings suggest that the sample size was sufficient to detect differences between groups, and the current study provides a useful estimate of variance in attentional bias in this population, which will be helpful in determining sample sizes for future research. However, the difficulties in determining a

reliable power calculation for the final research question may have resulted in an underpowered sample.

### **4.3.3 Processes and Procedures**

#### **4.3.3.1 Blinding**

Due to the design of the research and practicalities, the researchers could not be blind to the group or hypotheses being investigated, which may have resulted in some unintentional bias in the way that participants were treated. In order to reduce researcher bias as much as possible, standardised instructions explaining how to answer or respond to all of the measures, including the IQ assessment, were given, and standardised visual analogue scales were used with all researchers in order to support participants equally.

#### **4.3.3.2 Support**

All participants could have a member of staff, advocate or care worker present with them throughout the information and consent process, or during the entire assessment, if they wished. Substantially more participants from the IDNO group had someone present during the consent and assessment process, however this was typically due to requirements of the recruitment facility, rather than because it was requested by the participant. If a support worker/carer was present throughout the assessment, it was made clear that they would not be able to answer for participant, or prompt the participant in their responses. It is possible that the presence of another person may have altered the participant's responses to the tasks, however this is outweighed by ethical considerations, health and safety requirements of the host location, and the need to ensure that felt comfortable and adequately supported when taking part in research.

#### **4.3.3.3 Contextual Factors**

All rooms were quiet and largely free from distractions, with participants facing away from windows. Although appropriate measures were taken to minimise noise, such as closing windows, the circumstances and type of room used to conduct the assessment varied between participants, and it was not possible to rule out the possible effects of variables outside of the researcher's control, such as noise in corridors or adjoining rooms. Ideally, all participants would have been seen under the same conditions, however this was not practicable due to the nature of the participant samples.

#### **4.3.3.4 Assessment Order**

Unlike previous studies (e.g. Smith & Waterman, 2003) the order of assessments was fixed so that the questionnaires (which were all associated with affect) were administered after the dot-probe task. This was done in order to eliminate the possibility of priming participants' emotion-cognition networks, which could have resulted in the priming of their attention (Todorov & Bargh, 2002). Whilst this may have meant that participants were more fatigued by the time they completed the EQ, all participants were offered regular breaks to minimise this. In the dot-probe task, which was the longest task to complete, the presentation of the image pairs was randomised using the computer software, and so was different for each participant, thereby eliminating order effects. This meant that there were no consistent practice or fatigue effects across the task that would have interacted with trial type.

#### **4.3.4 Measures**

##### **4.3.4.1 IQ Assessment**

The two sub-test Wechsler Abbreviated Scale of Intelligence (Wechsler 1999) was used to assess full scale IQ in participants who did not have a recent accessible IQ assessment. It provided a validated measurement of intellectual functioning, and was

selected in order to ensure no undue burden was placed on participants. However, it offers limited information regarding different aspects of cognitive ability. It may have been useful to understand how attentional bias relates to some of the scales on the Wechsler Adult Intelligence Scales (Wechsler, 1997, 2008) that measure processing speed or perceptual organisation, which could have offered useful insights into any potential group differences in processes that can interact with attention.

#### **4.3.4.2 Demographic and Offence Information**

Demographic and offence information was collected using a proforma completed with the participant, and review of participant records from the service they were recruited. The information collected through the interview was variable; some participants were able to provide detailed demographic information, whereas others were uncertain or did not know the answers to the questions. Similarly, use of collateral records was helpful in some cases and helped to reduce reliance on erroneous information, however many participants had clinical records that had been either incomplete or out of date. In the IDO group, many participants' files had not been transferred from the units where they had previously resided. It is likely that diagnoses of mental and physical health problems, type of school and school leaving age are likely to be unreliable, and therefore this data should be interpreted with caution. Although measures are available that can offer on the spot assessments, such as checklists of mental health problems (Sturme, Newton, Cowley, Bouras, & Holt, 2005), these were considered to be prohibitively time consuming in the context of this study.

In the IDNO group, people recruited from care homes or day centres had almost no information on file. Given the reliance on self-report data, it is therefore possible that some participants in this group may have committed an offence, and did not inform the researcher. If this were the case, this may have confounded the empathy and attentional

bias score observed in this study. Including other methods of collecting offence histories, such as use of the Offenders Index which collects criminal conviction data from the courts, may have helped to overcome self-report bias and incomplete file information.

#### **4.3.4.3 Empathy**

In assessing empathy, it may be been helpful to have a measure that specifically examined victim empathy. However, as the IDNO group would have had no “victim”, this would then need to be assessed using a vignette or similar hypothetical assessment tool. As such, this would rely heavily on theory of mind skills, and consequently, would not have been a useful measure of global empathy. The Empathy Quotient was selected for use in this study as it is a global empathy assessment tool, has the benefit of being brief, and has previously been used in this population. Although previous assessment of EQ reliability was average, Cronbach’s alpha is substantially more robust in the present study, supporting its utility in the present study.

#### **4.3.4.4 Dot-Probe Task**

The use of pictorial rather than lexical stimuli in the dot-probe has the benefit of making it accessible to the ID population, but is also more likely to mimic attentional biases observed in real life, as images are more strongly associated with affective responses (Loney et al., 2003). Images had previously validated for experimental use (Lang et al., 2008), and were selected to be matched between trial types as far as possible, in particular, in terms of valence and arousal. However, it should be acknowledged that the negative images, on the whole, were darker than the positive and neutral images. Given the speed at which the image was presented (500ms), this likely made their content more difficult to ascertain, and consequently, may have elicited increased attention from participants trying

to make out the contents of the images. However, this would be unlikely to have been associated with between group differences.

Perhaps the most important consideration with regards to images is that all studies of clinical populations, and many studies of offenders, have used stimuli which are specifically salient to the population in question (Mokros et al., 2010; Yiend & Mathews, 2001). Attentional bias is most likely to be observed when the image is salient, or matches the interests of the individual, as this is likely to be associated with certain, offence salient schema. The current sample was selected to be representative of IDO without specifying an offence type, and this is a preliminary investigation to see whether an attentional bias can be observed in offenders with ID, so in line with other studies in offenders images were selected in terms of general affective type, rather than being matched to the offence. Having found significant differences in attentional bias using generic, affective stimuli, this paves the way for future research using new, and possibly more offence specific stimuli in the future.

Although pictures were matched for arousal (Lang et al., 2008), the ratings used to establish this were taken from men and women in the general population. It would have been beneficial to establish ratings using an ID sample, and additionally, to record level of arousal or perceived distress in response to the images presented. It is possible negative pictures may have been perceived as threatening, or elicited emotions such as fear, which may have meant an attentional bias akin to that seen in anxiety disorders may have driven the findings. No distress was reported during or following the experiment, reducing the likelihood of such effects, however future studies may benefit from a recording such information subsequent to the task, in order to examine whether this interacts with attentional bias.



It was noted in Chapter 1 that there is substantial variation in the presentation time of the stimulus of interest across the literature (e.g. 50ms – 1250ms). Across many studies in different populations, the stimuli and probe have been presented for a standard 500ms (Bradley, Mogg, Falla, & Hamilton, 1998; Mogg et al, 2004). As this time had also been used in previous studies of attentional bias in people with ID (Dodd & Porter, 2010, 2011), and similar study designs with offenders (e.g. Smith & Waterman, 2003), it was therefore used to inform the present study. Studies have variously show that attentional bias is, and is not, affected by stimulus duration (Bradley et al, 1999; Cooper & Langton, 2006), so exploring several different stimuli durations in the future may help to enhance our understanding of the nature of attentional bias in this population.

Finally, given the overall differences in RT across the task, it is worth considering that there may be differences in motor speed between groups, or differences between groups in terms of more general attentional abilities. In future studies, the former could easily be measured using a computer task designed to measure RT to standardised, neutral stimuli, or using a pen and pencil measure, such as the digit symbol copy test from the WAIS. In order to understand whether there were group differences across the attentional construct, for example, in visual scanning, and in particular, to see if this accounted for age differences, a test of attention, such as the Testing Battery for Attentional Performance (Zimmermann & Fimm, 1993) might have been useful, similar to previous studies (Mokros et al., 2010).

#### **4.3.4.5 Analyses**

The majority of the variables in this study were not normally distributed, however skewed data is expected when analysing RT, as the results necessarily dependent upon stimuli having different salience to different participant groups (Gress & Laws, 2009). As

non-parametric tests are less powerful, and increase the chance of committing a Type II error (incorrectly accepting that the null hypothesis is true), bootstrapped parametric tests were used, which are robust to violations of assumptions and outliers (Field, 2013) . Lack of normality prevents knowing the shape of the sampling distribution, and bootstrapping fits a model to data, calculates a “functional” (i.e. tests to determine whether it works), then estimates a new sampling distribution by generating synthetic data from the model (Shalizi, 2010). Essentially, the actual data is treated as the population, and bootstrapping then draws smaller samples from this data, and the parameter of interest, such as the mean, is established in each bootstrap sample. A 95% confidence interval is used in order to work out the limits within which 95% of the data fall. This methodology is preferable to non-parametric tests not only because it is more robust, but also because it does not negatively influence the power of the study.

#### **4.3.5 Section Summary**

There are a number of strengths and weakness to the sample used, the measures selected, and the assessment processes used in this study. The use of a representative IDO sample and an adequate sample size are two important factors which facilitate generalisability of the findings, and the use of standardised assessment tools and instructions for the paper and computer tasks helped to reduce variability and researcher bias. Conversely, limitations to this study include a lack of group equivalence in terms of neurodevelopmental disabilities, which may have confounded results, and difficulty accessing the relevant information meant it was not possible to understand whether there were group differences in socio-economic status, or whether treatment history influenced attentional bias in the offender group.

A strength, and a weakness to the dot-probe task is the nature of the stimuli selected, which means conclusions can be drawn only in relation to how people encode general affective information, rather than examining whether they have an attentional bias for specific types of information. In terms of the data analysis, data were not normally distributed, however application of bootstrapping to the analysis meant that results from the current study are more robust than they otherwise would have been through using only non-parametric data analysis.

#### **4.4 Theoretical Implications**

It has long been argued that information that is most readily perceived is that which supports or reinforces our prior perceptions and beliefs about the world, and thereby enables people to make the most efficient use of an attentional system which has limited capacity (Fiske & Taylor, 1991). According to their model, Ingram and Kendall (1986) suggest that the operational level (the level at which management and encoding of information occurs), is influenced by emotion, motivation, heuristics and circumstances. The results of the current study suggest that IDO and IDNO have different biases in their attention, that is, different biases at the operational level of information processing. Together with a small number of previous investigations (van Duijvenbode et al., 2012; Watson, 2006), the data from the current study supports the idea that attentional bias can be measured in people with ID and IDO, and that it can be used to ascertain meaningful differences between groups (Dodd & Porter, 2010, 2011). It also supports the seminal work of Crick and Dodge's (1994) social information processing theory, which states that attention to, and encoding of, external information is vital if this information is going to be incorporated into goals, and a behavioural or affective response is going to be formulated and actioned.

Theoretically, it is assumed that the initial stages of information processing form an integral part of moral development and empathy explanations of offending. In moral theories of offending, Gibbs (2013) suggests that moral and immoral behaviours are integrally linked to cognitive distortions and biases, which necessarily stem from information processing deficits (Lemerise & Arsenio, 2000). Although the current study found no direct relationship between empathy and attentional bias, previous research suggests that moral reasoning may be a mediating factor between attentional bias and empathy (Langdon et al., 2011). This study is part of a broader investigation that will investigate these relationships, and a larger sample size is planned, such that the possibility of a Type II error will be overcome.

Whilst the current findings have not been able to replicate observations in the general population that relate attentional bias to empathy (Hofelich & Preston, 2012), it is important to acknowledge that simply because theories argue attentional bias is an early stage process (Garrigan & Langdon, In Press), this does not mean that attentional bias is a causal factor in empathy. Empathy theories argue both that the way in which a person attends to, and recognises affective information, is a precursor of their empathic (both affective and behavioural) response (Hoffman, 1977), but also that top-down processing (e.g. existing cognitions, previous experiences, or memories related to empathy and affect) can also influence how stimuli are attended to and encoded (Hofelich & Preston, 2012; Preston & Stansfield, 2008). A cross-sectional examination cannot provide evidence of cause and effect, and should attentional bias and empathy be established to have a relationship, much more work will be needed to understand causality.

## 4.5 Clinical Implications

In disorders such as anxiety and depression, cognitive models acknowledge that automatic and preconscious attentional bias plays a key role in the aetiology and maintenance of the presenting problem, forming a basis for the development of cognitive distortions (MacLeod & Mathews, 1988; J. Williams et al., 1997). This cognitive approach is a firm foundation for cognitive-behavioural interventions, which are now some of the most common approaches for treatment of a wide variety of mental health problems (National Institute for Health and Clinical Excellence, 2008). The aim of these interventions is to develop more adaptive cognitions, emotions and behaviour, by increasing an individuals' awareness of empathic and information processing biases or deficits, and using a range of techniques to develop more adaptive processes.

An increasing evidence base suggests that cognitive behavioural therapies (CBT) are effective with people with ID. In IDO, research has demonstrated the application of CBT with men with anger and aggression (Willner, 2007), following arson convictions (Taylor, Thorne, Robertson, & Avery, 2002), in sex offenders (Sex Offender Treatment Services Collaborative – Intellectual Disabilities, 2010), and in female offenders (Allan, Lindsay, Macleod, & Smith, 2001). The findings from the current study suggest that IDO have an information processing bias for affective information, which offers support for the use of CBT interventions in a similar way to CBT used in clinical populations – that is, seeking to reduce biases that are considered unhelpful. Furthermore, in future studies using CBT in IDO, it may be that ascertaining whether or not an individual exhibits biases in information processing pre and post intervention could contribute to the understanding of treatment outcomes, and mechanisms of change. Attentional bias tasks have already been applied as assessment tool in other areas (Mathews, Mogg, Kentish, & Eysenck, 1995), and

the benefits of the dot-probe being language free is particularly important in this population.

Despite the increasing research into CBT, it is also important to note that some factors associated with ID are thought to pose an obstacle for engagement in talking therapy, such as reduced expressive and receptive language skills, memory impairments, or executive dysfunction problems (see Willner, 2009). Whilst it is positive to see that the creation of idiosyncratic, formulation driven approaches to treatment can make it possible to support individuals with these deficits (Taylor, Novaco, & Johnson, 2009; Willner, Bailey, Parry, & Dymond, 2010), it may also be helpful to also look forward to alternative approaches that may also confer therapeutic benefits. Attention Bias Modification (ABM), a sub-type of cognitive bias modification programmes are one such example (Bar-Heim, 2010). They are based on the idea that specifically altering the way in which an individual processes external information makes it possible to reduce levels of a clinical phenomenon of interest.

Using an attention-training variant of an attentional bias task, whereby the location of the probe is systematically manipulated such that targets will more frequently appear at the location of the neutral stimulus, a new bias can be learnt that targets attention away from salient stimuli. Evidence already shows this has positive outcomes in disorders such as generalised anxiety disorder (Amir, Beard, Burns, & Bomyea, 2009). Given these preliminary findings and the aforementioned benefits of the dot-probe task in this population, the future consideration of ABM in IDO might be warranted, either as a sole or adjunctive treatment. However, much more research would be needed in order to confirm the existence and nature of attentional bias in this population, and its role in offending behaviour, before such a line of enquiry could be pursued.

Finally, findings from this study may also suggest that the dot-probe task could be used to investigate other types of information processing bias in people with ID, and there is great scope for altering the task stimuli in a number of ways that reflect different clinical presentations. Given the strength of anxiety and depression biases observed in the general population, it is highly possible that similar biases exist in people with ID with comparable mental health problems, and again, evidence of such a bias would offer support for the application of cognitive-behavioural interventions.

#### **4.6 Future Research**

Discussions of the findings in relation to the methodological considerations, theoretical and clinical implications have raised a number of issues that would benefit from consideration in future research. In order for more definitive conclusions to be drawn in this field, studies with larger sample sizes and additional control groups could be used to investigate different interactions between variables of interest. Also, examination of the impact of both psychological and pharmacological treatment on bias scores, and varied lengths of presentation of the stimulus, may be worthy of investigation. Furthermore, the use of vignettes may be helpful in understanding the effects of priming on how information is processed, as this can increase the salience of the stimuli (Ward et al., 2006).

It will also be beneficial to examine the role of offender type, and stimuli, in more detail. One way of doing this could be to use the current study design, and to explore whether a different set of images elicits the same attentional bias. A recent study by van Duijvenbode et al. (2012) described methods for identifying and standardising stimuli for use in an attentional bias task, specifically in IDO. Use of such a methodology with the same sample completing the attentional bias task would give valuable information as to how the participants perceive the image (e.g. they could rate the images on valence,

pleasantness, attractiveness etc.), and this would provide useful information in interpreting the nature of any attentional bias observed.

Alternatively, a more homogenous sample of IDO who have committed a specific type of offence could be examined, and stimuli could then be specifically matched to the offence group, in order to see whether salience has an influence over the findings. For example, participants could be examined in terms of their index offence e.g. violent crime, arson, or sexual offence. The use of a case series methodology involving the collation of more in depth demographic and offence information, and generation of idiographic stimuli, could also be used to investigate the degree to which the personal salience of the stimuli influences attentional bias. In addition, female IDO are significantly unrepresented in the literature, and it would be interesting to see if the current findings are replicated across both genders.

It would also be helpful to consider a number of new avenues of investigation, building upon the evidence from the current study. Current investigations examining attentional bias, empathy and moral reasoning are underway, but a necessary next step will be to explore how attentional bias specifically relates to cognitive distortions in this population. A number of measures exist that measure cognitive distortions expressed by IDO, particularly with sex offenders (Lindsay, Whitefield, Carson, Broxholme, & Steptoe, 2004), but there are also measures that can be applied across offender groups (Barriga, Gibbs, Potter, & Liao, 2001). Such studies will help to make more direct links regarding how different biases in information processing interact with offence behaviour, and to understand how they can be better targeted through treatment.

Attention has a number of physiological consequences, such as autonomic arousal and electro-cortical activity, and it would be interesting to see whether such measures can



also identify physiological differences between groups. In particular, using a direct measurement of attentional deployment, such as eye gaze tracker, would help to disentangle whether attentional bias is associated with vigilance or disengagement. Finally, although the aetiology of attentional bias in IDO is unknown, its presence suggests that it may be worthy of future investigation in terms of therapeutic interventions. Existing cognitive-behavioural interventions are increasingly being pursued in IDO, but there is also evidence from other clinical populations that this sort of cognitive responding can be modified through both holistic and more targeted approaches (Bar-Heim, 2010), and the present study paves the way for future investigations that may seek to explore such interventions.

#### **4.7 Chapter Summary and Conclusions**

A number of theories of offending in people with ID exist, however, models that draw together these ideas in order to create a more comprehensive understanding are likely to have the greatest explanatory potential. The allocation of attentional resources is the first step in information processing, empathy and moral reasoning theories that describe offending, and the present investigation sought to examine attentional bias in IDO, and to consider how this relates to empathy.

This thesis has demonstrated that there are significant differences in empathy and the way in which offenders and non-offenders with ID process affective information, but that attentional bias is not able to predict group differences in empathy. Taking the present study together with previous investigations in non-ID offenders, it can be concluded that there is some support for the application of attentional theories of information processing within the IDO population, although a number of factors need to be explored in greater detail before more robust conclusions can be drawn about this phenomenon. At present, it would be inappropriate to target information processing as a mechanism for change in

clinical interventions, however the results suggest that cognitive tasks are able to capture group differences. If future research addressed some limitations of the present study and more precisely defined the nature of this bias, measures of attentional bias may have the potential to be used as an assessment or outcome tool in the future, and may even have application in therapeutic contexts.

## 5 References

- Akrami, N., Ekehammar, B., Claesson, M., & Sonnander, K. (2006). Classical and modern prejudice: attitudes toward people with intellectual disabilities. *Research in Developmental Disabilities, 27*(6), 605-617.
- Allan, R., Lindsay, W. R., Macleod, F., & Smith, A. (2001). Treatment of women with intellectual disabilities who have been involved with the criminal justice system for reasons of aggression. *Journal of Applied Behavioural Research in Intellectual Disabilities, 14*(340-347).
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders (IV-TR)* (4th ed.). Washington, DC: American Psychiatric Association.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Association.
- Amir, N., Beard, C., Burns, M., & Bomyea, J. (2009). Attention modification program in individuals with generalised anxiety disorder. *Journal of Abnormal Psychology, 118*, 28-33.
- Anderson, N., & Stanford, M. (2012). Demonstrating emotional processing differences in psychopathy using affective ERP modulation. *Psychophysiology, 49*, 792-806.
- Arsenio, W. F., & Lemerise, E. A. (2004). Aggression and moral development: Integrating social information processing and moral domain models. *Child Development, 75*(4), 987-1002.
- Ashman, L., & Duggan, L. (2002). Interventions for learning disabled sex offenders. *Cochrane Database Systematic Review, 2*, CD003682.
- Axelrod, B. N. (2002). Validity of the Wechsler Abbreviated Scale of Intelligence and other very short forms of estimating intellectual functioning. *Assessment, 9*(1), 17-23.
- Bar-Haim, Y., Lamy, D., Pergamin, L., Bakermans-Kranenburg, M. J., & van, I. M. H. (2007). Threat-related attentional bias in anxious and nonanxious individuals: a meta-analytic study. *Psychological Bulletin, 133*, 1-24.
- Bar-Heim, Y. (2010). Research Review: Attention bias modification (ABM) - a novel treatment for anxiety disorders. *Journal of Child Psychology and Psychiatry, 51*(8), 859-870.

- Baroff, G. S. (1996). *Manual of Diagnosis and Professional Practice in Mental Retardation*. Washington: American Psychological Association.
- Baron-Cohen, S., & Wheelwright, S. (2004). The empathy quotient: an investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. *Journal of Autism and Developmental Disorders*, *34*(2), 163-175.
- Barriga, A. Q., Gibbs, J. C., Potter, G. B., & Liau, A. K. (2001). *How I Think (HIT) Questionnaire Manual*. Champaign, IL: Research Press.
- Barron, P., Hassiotis, A., & Banes, J. (2002). Offenders with intellectual disability: The size of the problem and therapeutic outcomes. *Journal of Intellectual Disability Research*, *46*(6), 454-463.
- Barron, P., Hassiotis, A., & Banes, J. (2004). Offenders with intellectual disability: A prospective comparative study. *Journal of Intellectual Disability Research*, *48*(1), 69-76.
- Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, *56*(6), 893-897.
- Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression: A treatment manual*. New York: Guildford Press.
- Beyer, S., Brown, T., Akandi, R., & Rapley, M. (2010). A comparison of quality of life outcomes for people with intellectual disabilities in supported employment, day services and employment enterprises. *Journal of Applied Research in Intellectual Disabilities*, *23*(3), 290-295.
- Blake, M., & Weinberger, J. (2006). The impact of childhood sexual abuse upon implicit processing of intimacy-related stimuli. *Trauma and Crisis*, *9*, 29-44.
- Blanck, P. D., Rosenthal, R., Snodgrass, S. E., DePaulo, B. M., & Zuckerman, M. (1982). Longitudinal and cross-sectional age effects in nonverbal decoding skill and style. *Developmental Psychology*, *18*(3), 491-498.
- Bower, G. H. (1981). Mood and memory. *American Psychologist*, *36*, 129-148.
- Bradley, B. P., Mogg, K., Falla, S. J., & Hamilton, L. R. (1998). Attentional bias for threatening facial expressions in anxiety: Manipulation of stimulus duration. *Cognition and Emotion*, *12*, 737-753.

- Bradley, B. P., Mogg, K., White, J., Groom, C., & de Bono, J. (1999). Attentional bias for emotional faces in generalized anxiety disorder. *British Journal of Clinical Psychology, 38*(3), 267-278.
- Bradley, M. M., Codispoti, M., Sabatinelli, D., & Lang, P. J. (2001). Emotion and motivation II: Sex differences in picture processing. *Emotion, 1*(3), 300-319.
- Broadbent, D. E. (1958). *Perception and Communication*. London: Pergamon.
- Brown, T. (2013). *A New Understanding of ADHD in Children and Adults: Executive Function Impairments*. UK: Routledge.
- Broxholme, S. L., & Lindsay, W. R. (2003). Development and preliminary evaluation of a questionnaire on cognitions related to sex offending for use with individuals who have mild intellectual disabilities. *Journal of Intellectual Disability Research, 47*, 472-482.
- Bryan, T. H., & Bryan, J. J. (1978). Social interactions of learning disabled children. *Learning Disability Quarterly, 1*, 33-38.
- Bryant, B. (1982). An index of empathy for children and adolescents. *Child Development, 53*, 413-425.
- Cabral, H. J. (2008). Statistical primer for cardiovascular research: Multiple comparisons procedures. *American Heart Association, 117*, 698-701.
- Cans, C., Wilhelm, L., Baille, M. F., du Mazaubrun, C., Grandjean, H., & Rumeau-Rouquette, C. (1999). Aetiological findings and associated factors in children with severe mental retardation. *Developmental Medicine and Child Neurology, 41*, 233-239.
- Carr, A., O'Reilly, G., Noonan Walsh, P., & McEvoy, J. (2007). *The Handbook of Intellectual Disability and Clinical Psychology Practice*. UK: Routledge.
- Carstensen, L. L., Pasupathi, M., Mayr, U., & Nesselroade, J. R. (2000). Emotional experience in everyday life across the adult lifespan. *Journal of Personality and Social Psychology, 79*, 644-655.
- Choi, D., & Watanuki, S. (2014). Effect of empathy trait on attention to faces: an event-related potential (ERP) study. *Journal of Physiological Anthropology, 33*(4).
- Cima, M., Tonnaer, F., & Lobbestael, J. (2007). Moral emotions in predatory and impulsive offenders using implicit measures. *Netherlands Journal of Psychology, 63*(4), 133-142.

- Cisler, J. M., Bacon, A. K., & Williams, N. L. (2009). Phenomenological characteristic of attention biases towards threat: A critical review. *Cognitive Therapy and Research*, 33, 221-234.
- Clare, I. C. H. (1993). Issues in the assessment and treatment of male sex offenders with mild learning disabilities. *Sexual and Marital Therapy*, 8(2), 167-179.
- Clare, I. C. H., & Murphy, G. H. (1998). *Working with offenders or alleged offenders with intellectual disabilities*. Chichester: Wylie.
- Clements, J. (1987). *Severe Learning Disability and Psychological Handicap*. Chichester: John Wiley & Sons.
- Coan, J. A., & Allen, J. (2007). *Handbook of Emotion Elicitation and Assessment*. Oxford: OUP.
- Cohen, D., & Strayer, J. (1996). Empathy in conduct-disordered and comparison youth. *Developmental Psychology*, 32, 988-998.
- Cooper, R. M., & Langton, S. R. (2006). Attentional bias to angry faces using the dot-probe task? It depends when you look for it. *Behaviour Research and Therapy*, 44(9), 1321-1329.
- Cooper, S. A. (1997). Epidemiology of psychiatric disorders in elderly compared with younger adults with learning disabilities. *British Journal of Psychiatry*, 170, 375-380.
- Cope, R. (1995). *Mental health legislation*. London: Gaskell.
- Crick, N. R., & Dodge, K. A. (1994). A review and reformulation of social-information-processing mechanisms in children's social adjustment. *Psychological Bulletin*, 115, 74-101.
- Cronbach, L. J. (1955). Processes affecting scores on understanding of others and assuming similarity. *Psychological Bulletin*, 36, 177-193.
- Cullen, F. T., Gendreau, P., Jarjoura, R., & Wright, J. (1997). Crime and the bell curve. *Crime and Delinquency*, 43, 387-411.
- Cuthill, F. M., Espie, C. A., & Cooper, S. A. (2003). Development and psychometric properties of the Glasgow Depression Scale for people with a Learning Disability. Individual and carer supplement versions. *British Journal of Psychiatry*, 182, 347-353.

- Dalgleish, T. (1995). Performance on the emotional Stroop task in groups of anxious, expert, and control subjects: A comparison of computer and card presentation formats. *Cognition & Emotion*, 9, 341–362.
- Dalgleish, T., & Watts, F. N. (1990). Biases of attention and memory in disorders of anxiety and depression. *Clinical Psychology Review*, 10, 589–604.
- Damasio, R. (1994). *Descartes' Error: Emotion, Reason, and the Human Brain*. New York: Harper Collins.
- Davis, M. H. (1980). A Multidimensional Approach to Individual Differences in Empathy. *JSAS Catalog of Selected Documents in Psychology*, 10(85).
- Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, 44, 113–126.
- Davis, M. H., & Whalen, P. J. (2001). The amygdala: vigilance and emotion. *Molecular Psychiatry*, 6(1), 13-34.
- Day, K. (1993). *Crime and mental retardation: a review*. Chichester: Wylie.
- Dear, B. F., Sharpe, L., Nicholas, M. K., & Refshauge, K. (2011). The psychometric properties of the dot-probe paradigm when used in pain-related attentional bias research. *Journal of Pain*, 12(12), 1247-1254.
- Deater-Deckard, K., Dodge, K. A., Bates, J. E., & Pettit, G. S. (1998). Multiple risk factors in the development of externalizing behavior problems: group and individual differences. *Developmental Psychopathology*, 10(3), 469-493.
- Demeyer, I., & De Raedt, R. (2013). Attentional Bias for Emotional Information in Older Adults: The Role of Emotion and Future Time Perspective. *Public Library of Science: One*, 8(6), e65429.
- Department of Health. (2001). *Valuing People: A New Strategy for Learning Disability for the 21st Century*. CM 5086. London: Stationery Office.
- Department of Health. (2005). *Mental Capacity Act 2005*. London: DH publications.
- Department of Health. (2007). *Mental Health Act 2007*. London: DH Publications.
- Department of Justice. (2010). UK Government Offence Classifications. Retrieved Online, January, 2014
- Detterman, D. K., Gabriel, L. T., & Ruthsatz, J. M. (2000). *Intelligence and mental retardation*. Cambridge: Cambridge University Press.

- Dodd, H. F., & Porter, M. A. (2010). I see happy people: Attention bias towards happy but not angry facial expressions in Williams syndrome. *Cognitive Neuropsychiatry*, *15*(6), 549-567.
- Dodd, H. F., & Porter, M. A. (2011). There's that scary picture: Attention bias to threatening scenes in Williams syndrome. *Neuropsychologia*, *49*(247-253).
- Dodge, K. A., Godwin, J., & Conduct Problems Prevention Research Group. (2013). Social-information-processing patterns mediate the impact of preventive intervention on adolescent antisocial behavior. *Psychological Science*, *24*, 456-465.
- Dodge, K. A., & Tomlin, A. M. (1987). Utilization of self-schemas as a mechanism of interpretational bias in aggressive children. *Special Issue: Cognition and action. Social Cognition*, *5*(3), 280-300.
- Domes, G., Mense, J., Vohs, K., & Habermeyer, E. (2013). Offenders with antisocial personality disorder show attentional bias for violence-related stimuli. *Psychiatry Research*, *209*, 78-84.
- Down, J. L. (1887). *Mental affections of children and youth*. London: J & A Churchill.
- Edgar, K., & O'Donnell, I. (1997). Responding to victimisation: Victimisation and safety in prisons and young offender institutions. *Prison Service Journal*, *109*, 15-19.
- Egloff, B., & Hock, M. (2003). Assessing attention allocation toward threat-related stimuli: a comparison of the emotional Stroop task and the attentional probe task. *Personality and Individual Differences*, *35*(2), 475-483.
- Eide, P., Kemp, A., Silberstein, R. B., Nathan, P. J., & Stough, C. (2002). Test-retest reliability of the emotional stroop task: examining the paradox of measurement change. *Journal of Psychology*, *136*(5), 514-520.
- Eisenberg, N. (1989). *The development of prosocial values*. NJ: Erlbaum: Hillsdale.
- Eisenberg, N., & Strayer, J. (1987). *Empathy and its development*. UK: Cambridge University Press.
- Ellis, N. R., Deacon, J. R., & Wooldridge, P. W. (1985). Structural memory deficits of mentally retarded persons. *American Journal of Mental Deficiency*, *89*(4), 393-402.
- Emerson, E., & Hatton, C. (2008). *People with Learning Disabilities in England*: Centre for Disability Research: Lancaster University.
- Farrington, D. P. (1998). *Individual differences and offending*. Oxford: Oxford University Press.



- Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G\*Power 3.1: tests for correlation and regression analyses. *Behaviour Research Methods*, 41(4), 1149-1160.
- Feinman, S., & Lewis, M. (1983). Social referencing at 10 months: a second-order effect on infants' responses to strangers. *Child Development*, 54, 878-887.
- Feshbach, N. (1975). Empathy in children: Some theoretical and empirical considerations. *Counselling Psychologist*, 5(25-30).
- Field, A. (2013). *Discovering Statistics using IBM SPSS Statistics*. UK: SAGE Publications Ltd.
- Fiske, S. T., & Taylor, S. E. (1991). *Social cognition* (2nd ed.). New York: McGraw-Hill.
- Flesch, R. (1948). A new readability yardstick. *Journal of Applied Psychology*, 32(3), 221-233.
- Fletcher-Watson, S., Leekam, S. R., Findlay, J. M., & Behan, E. C. (2008). Attention to social information in typical and autistic adults - Evidence from a new social change blindness paradigm. *Journal of Autism and Developmental Disorders*, 38(9), 1785-1790.
- Fox, E., Ridgewell, A., & Ashwin, C. (2009). Looking on the bright side: biased attention and the human serotonin transporter gene. *Proceedings of the Royal Society: Biological Sciences*, 276(1663), 1747-1751.
- Fox, E., Russo, R., Bowles, R., & Dutton, K. (2001). Do threatening stimuli draw or hold visual attention in subclinical anxiety? *Journal of Experimental Psychology: General*, 130(681-700).
- Fozard, J. L., Verduyssen, M., Reynolds, S. L., Hancock, P. A., & Quilter, R. E. (1993). Age differences and changes in reaction time: The Baltimore longitudinal study of aging. *Journal of Gerontology*, 49(4), 179-189.
- Freedman, B. I., Rosenthal, L., Donahoe, C. P., Schlundt, D. G., & McFall, R. M. (1978). A social-behavioral analysis of skill deficits in delinquent and non-delinquent adolescent boys. *Journal of Consulting and Clinical Psychology*, 46, 1448-1462.
- Frijda, N. H. (1986). *The emotions*. Cambridge: Cambridge University Press.
- Fung, M. T., Raine, A., Loeber, R., Lynam, D. R., Steinhauer, S. R., Venables, P. H., & Stouthamer-Loeber, M. (2005). Reduced Electrodermal Activity in Psychopathy-Prone Adolescents. *Journal of Abnormal Psychology*, 114(2), 187-196.

- Garrigan, B., & Langdon, P. E. (In Press). *Social problem solving and moral development*: John Wiley and Sons Ltd.
- Geer, J. H., Estupinan, L. A., & Manguno-Mire, G. M. (2000). Empathy, social skills and other relevant cognitive processes in rapists and child molesters. *Aggression and Violent Behaviour, 5*, 99–126.
- George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update* (4th ed.). Boston: Allyn & Bacon.
- Gery, I., Miljkovitch, R., Bethoz, S., & Soussignan, R. (2009). Empathy and recognition of facial expressions of emotion in sex offenders, non-sex offenders and normal controls. *Psychiatry Research, 165*(3), 252-262.
- Gibbs, J. C. (1979). Kohlberg's moral stage theory. A Piagetian revision. *Human Development, 22*, 89-112.
- Gibbs, J. C. (2003). *Moral Development and Reality - Beyond the Theories of Kohlberg and Hoffman*. London: Sage Publications Ltd
- Gibbs, J. C. (2013). *Moral Development and Reality: Beyond the Theories of Kohlberg and Hoffman*. Oxford: Oxford University Press.
- Gibbs, J. C., Potter, G. B., Barriga, A. Q., & Liau, A. K. (1996). Developing the helping skills and prosocial motivation of aggressive adolescents in peer group programs. *Aggression and Violent Behavior, 1*(3), 283-305.
- Gillberg, C., & Soderstrom, H. (2003). Learning disability. *The Lancet, 362*, 811-821.
- Gilligan, C. (1982). *In a Different Voice: Psychological Theory and Women's Development*. Cambridge, MA: Harvard University Press.
- Glaser, W. R., & Florio, D. (2004). Beyond specialist programmes: a study of the needs of offenders with intellectual disability requiring psychiatric attention. *Journal of Intellectual Disability Research, 48*, 591-602.
- Glaser, W. R., & Glaser, M. O. (1982). Contextual effect on Stroop-like word and picture processing. *Journal of Experimental Psychology, 118*, 13-42.
- Goddard, H. (1914). *Feeble-Mindedness: Its Causes and Consequences*: Arno Press.
- Goddard, H. (1919). *Psychology and the Normal and Subnormal*. New York: Dodd, Mead and Co.

- Goldstein, H., & Higgins D'Alessandro, A. (2001). Empathy and attachment in relation to violent vs. non-violent offence history among jail inmates. *Journal of Offender Rehabilitation, 32*, 31–53.
- Goodman, R., Simonoff, E., & Stevenson, J. (1995). The impact of child IQ, parent IQ and sibling IQ on child and behaviour deviance scores. *Journal of Child Psychology and Psychiatry, 36*(3), 409–425.
- Gotlib, I. H., Krasnoperova, E., Yue, D. N., & Joormann, J. (2004). Attentional biases for negative interpersonal stimuli in clinical depression. *Journal of Abnormal Psychology, 113*(1), 121–135.
- Gray, J. A. (1982). The neuropsychology of anxiety: An enquiry into the functions of the septo-hippocampal system. *Behavioural Brain Sciences, 5*, 469–484.
- Gress, C. L. Z., & Laws, D. R. (2009). *Cognitive modelling of sexual arousal and interest: Choice reaction time measures*. Chichester: Wiley.
- Guarino-Ghezzi, S., & Treviño, A. J. (2005). *Understanding Crime: A Multidisciplinary Approach*. UK: Anderson Publishing.
- Hamelin, J., Travis, R., & Sturmey, P. (2013). Anger management and intellectual disabilities: a systematic review. *Journal of Mental Health Research in Intellectual Disabilities, 6*(1).
- Hanson, R. K. (2003). Empathy deficits of sexual offenders: A conceptual model. *Journal of Sexual Aggression, 9*, 13–23.
- Hanson, R. K., & Scott, S. (1995). Assessing perspective-taking among sexual offenders, nonsexual criminals, and nonoffenders. *Sexual Abuse: A Journal of Research and Treatment, 7*(4), 259–277.
- Harris, J. C. (1995). *Developmental neuropsychiatry, assessment, diagnosis and treatment of developmental disorders* (Vol. II). New York: Oxford University Press.
- Hatton, C. (1998). *Intellectual Disabilities – Classification, Epidemiology and Causes*. Chichester, West Sussex: Wiley.
- Hayes, S. (1996). Recent research on offenders with learning disabilities. *Tizard Learning Disability Review, 1*(7–15).
- Hayes, S., Shackell, P., Mottram, P., & Lancaster, R. (2007). The prevalence of intellectual disability in a major UK prison. *British Journal of Learning Disabilities, 35*(3), 162–167.

- Hermans, H., & Evenhuis, H. M. (2010). Characteristics of instruments screening for depression in adults with intellectual disabilities: systematic review. *Research in Developmental Disabilities, 31*(6), 1109-1120.
- Hermans, H., van der Pas, F. H., & Evenhuis, H. M. (2011). Instruments assessing anxiety in adults with intellectual disabilities: a systematic review. *Research in Developmental Disabilities, 32*(3), 861-870.
- Hernstein, R. J., & Murray, C. (1994). *The Bell Curve: Intelligence and Class Structure in American Life*. London: The Free Press.
- Hirschi, T., & Hindelang, M. J. (1977). Intelligence and delinquency: A revisionist review. *American Sociological Review, 42*, 571–587.
- Hockley, O. J., & Langdon, P. E. (In Press). Men with intellectual disabilities with a history of sexual offending: empathy for victims of sexual and non-sexual crimes. *Journal of Intellectual Disability Research*.
- Hodgins, S. (1992). Mental disorder, intellectual deficiency, and crime: evidence from a birth cohort. *Archives of General Psychiatry, 49*, 476-483.
- Hofelich, A. J., & Preston, S. D. (2012). The meaning in empathy: distinguishing conceptual encoding from facial mimicry, trait empathy, and attention to emotion. *Cognition and Emotion, 26*(1), 119-128.
- Hoffman, M. L. (1977). *Empathy, its development and prosocial implications*. Lincoln: University of Nebraska Press.
- Hoffman, M. L. (1987). *The contribution of empathy to justice and moral judgment*. UK: Cambridge University Press.
- Hoffman, M. L. (2000). *Empathy and Moral Development: Implications for Caring and Justice*. Cambridge: Cambridge University Press.
- Hogan, R. (1969). Development of an empathy scale. *Journal of Consulting and Clinical Psychology, 33*.
- Holland, A. J. (1991). Challenging and offending behavior by adults with developmental disorders. *Australia and New Zealand Journal of Developmental Disabilities, 17*, 119–126.
- Holland, A. J., Clare, I. C. H., & Mukhopadhyay, T. (2002). Prevalence of ‘criminal offending’ by men and women with intellectual disability and the characteristics of

- 'offenders': implications for research and service development. *Journal of Intellectual Disability Research*, 46, 6-20.
- Hollander, E., Kolevzon, A., & Coyle, J. T. (2010). *Textbook of Autism Spectrum Disorders*. USA: American Psychiatric Publishing.
- Holm, S. (1979). A simple sequentially rejective multiple test procedure. *Scandinavian Journal of Statistics*, 6(2), 65-70.
- IBM Corporation. (2012). IBM SPSS Statistics for Windows (Version 21.0). Armonk, New York: IBM Corporation.
- Ickes, W. (1997). *Empathic Accuracy*. New York: Guilford Press.
- Ingram, R., & Kendall, P. (1986). *Cognitive clinical psychology: Implications of an information processing perspective*. London: Academic Press Inc.
- Johnston, S. J., & Halstead, S. (2000). Forensic issues in intellectual disability. *Current Opinion in Psychiatry*, 13, 549–553.
- Jolliffe, D., & Farrington, D. P. (2004). Empathy and offending: A systematic review and meta-analysis. *Aggression and Violent Behaviour*, 9, 441-476.
- Juola, J. F. (1986). *Cognitive psychology and information processing: Content and process analysis for a psychology of the mind*. London: Academic Press Inc.
- Kahneman, D. (1973). *Attention and effort*. Englewood Cliffs, NJ: Prentice Hall.
- Kazdin, A. E. (2003). *Research design in clinical psychology*. Boston: Allyn and Bacon.
- Keenan, T., & Ward, T. (2000). A theory of mind perspective on cognitive, affective, and intimacy deficits in child sexual offenders. *Sexual Abuse: A Journal of Research and Treatment*, 12, 49–60.
- Kemp, A. H., Silberstein, R. B., Armstrong, S. M., & Nathan, P. J. (2004). Gender differences in the cortical electrophysiological processing of visual emotional stimuli. *NeuroImage*, 21(2), 632-646.
- Kendall, K. (2004). *Female offenders or alleged offenders with developmental disabilities: a critical overview*. London: Wiley-Blackwell.
- Kendall, P., Deardorff, P. A., & Finch, A. J. (1977). Empathy and socialization in first and repeat juvenile offenders and normals. *Journal of Abnormal Child Psychology*, 5, 93-97.

- Kimonis, E. R., Frick, P. J., Fazekas, H., & Loney, B. R. (2006). Psychopathy, aggression, and the processing of emotional stimuli in non-referred girls and boys. *Behavioural Sciences and the Law*, 24(1), 21-37.
- Kimonis, E. R., Frick, P. J., Munoz, L. C., & Aucoin, K. J. (2008). Callous-unemotional traits and the emotional processing of distress cues in detained boys: testing the moderating role of aggression, exposure to community violence, and histories of abuse. *Developmental Psychopathology*, 20(2), 569-589.
- Klimecki, M. R., Jenkinson, J., & Wilson, L. (1994). A study of recidivism among offenders with an intellectual disability. *Australia and New Zealand Journal of Developmental Disabilities*, 19, 209-219.
- Kohlberg, L. (1969). *Stage and sequence: The cognitive-development approach to socialization*. Chicago: Rand McNally.
- Kosson, D. S., Lorenz, A. R., & Newman, J. P. (2006). Effects of comorbid psychopathy on criminal offending and emotion processing in male offenders with antisocial personality disorder. *Journal of Abnormal Psychology*, 115(4), 798-806.
- Koster, E. H., Crombez, G., Verschuere, B., & De Houwer, J. (2004). Selective attention to threat in the dot probe paradigm: differentiating vigilance and difficulty to disengage. *Behaviour Research and Therapy*, 42(10), 1183-1192.
- Koven, N. S., Heller, W., Banich, M. T., & Miller, G. A. (2003). Relationships of distinct affective dimensions to performance on an emotional stroop task. *Cognitive Therapy and Research*, 27, 671-680.
- Kraus, R. M., & Fussell, S. R. (1996). *Social psychological models of interpersonal communication*. New York: Guilford Press.
- Lang, P. J. (1980). *Behavioral treatment and bio-behavioral assessment: computer applications*. Norwood, NJ: Ablex.
- Lang, P. J. (2000). Emotion, and motivation: Attention, perception, and action. *Journal of Sport & Exercise Psychology*, 20, 122-140.
- Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (2008). *International affective picture system (IAPS): Affective ratings of pictures and instruction manual*. Gainesville, FL: University of Florida.

- Langdon, P. E., Clare, I. C. H., & Murphy, G. H. (2010). Developing an understanding of the literature relating to the moral development of people with intellectual disabilities. *Developmental Review, 30*, 273-293.
- Langdon, P. E., Murphy, G. H., Clare, I. C. H., & Palmer, E. J. (2010). The psychometric properties of the Socio-Moral Reflection Measure--Short Form and the Moral Theme Inventory for men with and without intellectual disabilities. *Research in Developmental Disabilities, 31*(6), 1204-1215.
- Langdon, P. E., Murphy, G. H., Clare, I. C. H., Steverson, T., & Palmer, E. J. (2011). Relationships among moral reasoning, empathy, and distorted cognitions in men with intellectual disabilities and a history of criminal offending. *American Journal of Intellectual and Developmental Disabilities, 116*(6), 438-456.
- Langton, C. M., & Marshall, W. L. (2001). Cognition in rapists: Theoretical patterns by typological breakdown. *Aggression and Violent Behavior, 6*, 499-518.
- Lawrence, E. J., Shaw, P., Baker, D., Baron-Cohen, S., & David, A. S. (2004). Measuring empathy: reliability and validity of the Empathy Quotient. *Psychological Medicine, 34*(5), 911-919.
- LeDoux, J. (1996). *The emotional brain: The mysterious underpinnings of emotional life*. London: Phoenix.
- Lemerise, E. A., & Arsenio, W. F. (2000). An integrated model of emotion processes and cognition in social information processing. *Child Development, 71*(1), 107-118.
- Lennox, N. G., & Kerr, M. P. (1997). Primary health care and people with an intellectual disability: the evidence base. *Journal of Intellectual Disability Research, 41*, 365-372.
- Lewis, E. O. (1933). Types of mental deficiency and their social significance. *Journal of Mental Science, 79*, 298-304.
- Lindsay, W. R. (2002). Research and literature on sex offenders with intellectual and developmental disabilities. *Journal of Intellectual Disabilities Research, 46*, 74-85.
- Lindsay, W. R., Smith, A. H., Quinn, K., Anderson, A., Smith, A., Allan, R., & Law, J. (2004). Women with intellectual disability who have offended: characteristics and outcome. *Journal of Intellectual Disability Research, 48*(580-590).
- Lindsay, W. R., Taylor, J. L., & Sturmey, P. (2004). *Offenders with Developmental Disabilities*. London: Wiley-Blackwell.

- Lindsay, W. R., Whitefield, E., Carson, D., Broxholme, S., & Steptoe, L. (2004). *Questionnaire on attitudes consistent with sexual offending (QACSO): Administration and scoring manual*. Dundee, Scotland: National Health Service Scotland, University of Abertay.
- Lockwood, P. P., Bird, G., Bridge, M., & Viding, E. (2013). Dissecting empathy: high levels of psychopathic and autistic traits are characterized by difficulties in different social information processing domains. *Frontiers in Human Neuroscience*, 7(760).
- Loney, B. R., Frick, P. J., Clements, C. B., Ellis, M. L., & Kerlin, K. (2003). Callous-unemotional traits, impulsivity, and emotional processing in adolescents with antisocial behavior problems. *Journal of Clinical Child and Adolescent Psychology*, 32(1), 66-80.
- Lorenz, A. R., & Newman, J. P. (2002a). Deficient response modulation and emotion processing in low-anxious Caucasian psychopathic offenders: Results from a lexical decision task. *Emotion*, 2, 91-104.
- Lorenz, A. R., & Newman, J. P. (2002b). Do emotion and information processing deficiencies found in Caucasian psychopaths generalize to African-American psychopaths? *Personality and Individual Differences*, 32(6), 1077-1086.
- Lorenz, A. R., & Newman, J. P. (2002c). Utilization of emotion cues in male and female offenders with antisocial personality disorder: results from a lexical decision task. *Journal of Abnormal Psychology*, 111(3), 513-516.
- Lund, J. (1985). The prevalence of psychiatric morbidity in mentally retarded adults. *Acta Psychiatrica Scandinavica*, 72, 563-570.
- Lynam, D., Moffitt, T., & Stothome-Loeber, M. (1993). Explaining the relation between IQ and delinquency: Class, race, test motivation, school failure or self-control? *Journal of Abnormal Psychology*, 102(2), 187-196.
- Mabile, W. R. (1982). *The Mentally Retarded Defendant Program*. New York: Praeger.
- MacEachron, A. E. (1979). Mentally retarded offenders: Prevalence and characteristics. *American Journal of Mental Deficiency*, 84, 165-176.
- MacLeod, C., & Mathews, A. (1988). Anxiety and the allocation of attention to threat. *Quarterly Journal of Experimental Psychology A: Human Experimental Psychology*, 40, 653-670.



- MacLeod, C., Mathews, A., & Tata, P. (1986). Attentional bias in emotional disorders. *Journal of Abnormal Psychology, 95*(1), 15-20.
- Mannynsalo, L., Putkonen, H., Lindberg, N., & Kotilainen, I. (2009). Forensic psychiatric perspective on criminality associated with intellectual disability: a nationwide register-based study. *Journal of Intellectual Disability Research, 53*(3), 279-288.
- Marshall, W. L., & Barbaree, H. E. (1990). *An integrated theory of the etiology of sexual offending*. UK: Springer.
- Marshall, W. L., Hudson, S. M., Jones, R., & Fernandez, Y. M. (1995). Empathy in sex offenders. *Clinical Psychology Review*(15), 99–113.
- Mather, M., & Carstensen, L. L. (2005). Aging and motivated cognition: the positivity effect in attention and memory. *Trends in Cognitive Science, 9*, 496–502.
- Mather, M., & Knight, M. (2005). Goal-directed memory: The role of cognitive control in older adults' emotional memory. *Psychology and Aging, 20*, 554-570.
- Mathews, A., Mogg, K., Kentish, J., & Eysenck, M. (1995). Effect of psychological treatment on cognitive bias in generalized anxiety disorder. *Behaviour Research and Therapy, 33*(3), 293-303.
- Maudsley, H. (1872). *Responsibility in Mental Disease*. London.
- McFall, R. M. (1990). *The enhancement of social skills: An information-processing analysis*. New York: Plenum Press.
- McMackin, R. A., Leisen, M. B., Cusack, J. F., LaFratta, J., & Litwin, P. (2002). The relationship of trauma exposure to sex offending behavior among male juvenile offenders. *Journal of Child Sexual Abuse, 11*, 25-40.
- Mears, D., & Cochran, J. (2013). What is the effect of IQ on offending? *Criminal Justice and Behavior, 40*, 1280-1300.
- Medical Research Council. (1998). *Guidelines for Good Clinical Practice in Clinical Trials*. UK: Medical Research Council.
- Mehrabian, A., & Epstein, N. (1972). A measure of emotional empathy. *Journal of Personality, 40*, 525-543.
- Miller, P. A., & Eisenberg, N. (1988). The relation of empathy to aggressive and externalizing/antisocial behavior. *Psychology Bulletin, 103*(3), 324-344.
- Mindham, J., & Espie, C. A. (2003). Glasgow Anxiety Scale for people with an Intellectual Disability (GAS-ID): development and psychometric properties of a new measure

- for use with people with mild intellectual disability. *Journal of Intellectual Disability Research*, 47(Pt 1), 22-30.
- Mobini, S., & Grant, A. (2007). Clinical implications of attentional bias in anxiety disorders: An integrative literature review. *Psychotherapy: Theory, Research, Practice, Training*, 44(4), 450-462.
- Mogg, K., & Bradley, B. P. (1999). *Selective attention and anxiety: A cognitive-motivational perspective*. Chichester, UK: Wiley.
- Mogg, K., Bradley, B. P., Miles, F., & Dixon, C. (2004). Time course of attentional bias for threat scenes: testing the vigilance-avoidance hypothesis. *Cognition and Emotion*, 18, 689–700.
- Mogg, K., Holmes, A., Garner, M., & Bradley, B. P. (2008). Effects of threat cues on attentional shifting, disengagement and response slowing in anxious individuals. *Behaviour Research and Therapy*, 46(5), 656-667.
- Mokros, A., Dombert, B., Osterheider, M., Zappala, A., & Santtila, P. (2010). Assessment of pedophilic sexual interest with an attentional choice reaction time task. *Archives of Sexual Behaviour*, 39(5), 1081-1090.
- Morris, C. D., Niederbuhl, J. M., & Mahr, J. M. (1993). Determining the capability of individuals with mental retardation to give informed consent. *American Journal of Mental Retardation*, 98(2), 263-272.
- Morrissey, C., & Ingamells, B. (2011). Adapted dialectical behaviour therapy for male offenders with intellectual disability in a high secure environment: six years on. *Journal of Learning Disabilities and Offending Behaviour*, 2(1), 10-17.
- Muller, J. L., Sommer, M., Dohnel, K., Weber, T., Schmidt-Wilcke, T., & Hajak, G. (2008). Disturbed Prefrontal and Temporal Brain Function During Emotion and Cognition Interaction in Criminal Psychopathy. *Behavioral Sciences and the Law*, 26, 131-150.
- Murphy, G. H. (2000). Policy and service development trends: forensic mental health and social care services. *Tizard Learning Disability Review*(5), 32–35.
- Murphy, G. H., & Clare, I. C. H. (1995). *Adult's capacity to make decisions affecting the person: psychologist's contribution*. Chichester: John Wiley & Sons.
- Murphy, G. H., Harnett, H., & Holland, A. J. (1995). A survey of intellectual disabilities amongst men on remand in prison. *Mental Handicap Research*, 8, 81-98.

- Nasby, W., Hayden, B., & DePaulo, B. M. (1980). Attributional bias among aggressive boys to interpret unambiguous social stimuli as displays of hostility. *Journal of Abnormal Psychology, 89*, 459–468.
- National Institute for Health and Clinical Excellence. (2008) *Cognitive behavioural therapy for the management of common mental health problems*: Department of Health.
- Negri-Shoultz, N., & M., D. A. (1989). *The Test of Emotional Perception*. Unpublished manuscript: University of Wisconsin.
- Nummenmaa, L., Hyönä, J., & Calvo, M. G. (2006). Eye movement assessment of selective attentional capture by emotional pictures. *Emotion, 6*(2), 256-268.
- Ó Ciardha, C., & Gormley, M. (2012). Using a pictorial-modified stroop task to explore the sexual interests of sexual offenders against children. *Sex Abuse, 24*(2), 175-197.
- O'Brien, G. (2002). Dual diagnosis in offenders with intellectual disabilities: setting research priorities: A review of research findings concerning psychiatric disorder. *Journal of Intellectual Disability Research, 46*, 21-33.
- Öhman, A. (1993). *Fear and anxiety as emotional phenomena*. New York: Guilford Press.
- Paciello, M., Fida, R., Tramontano, C., Lupinetti, C., & Caprara, G. V. (2008). Stability and change of moral disengagement and its impact on aggression and violence in late adolescence. *Child Development, 79*(5), 1288-1309.
- Palmer, E. J. (2003). *Offending Behaviour: Moral Reasoning, Criminal Conduct and the Rehabilitation of Offenders*. Cullompton, UK: Wilan Publishing.
- Palmer, E. J., & Hollin, C. R. (2000). The inter-relations of sociomoral reasoning, perceptions of own parenting, and attribution of intent with self-reported delinquency. *Legal and Criminological Psychology, 5*, 201-218.
- Peirce, J. W. (2007). PsychoPy - Psychophysics software in Python. *Journal of Neuroscience Methods, 162*(1-2), 8-13.
- Pennington, B. F., & Ozonoff, S. (1996). Executive functions and developmental psychopathology. *Journal of Child Psychology and Psychiatry, 37*(1), 51-87.
- Piaget, J. (1932). *The Moral Judgement of the Child*. London: Routledge and Kegan Paul Ltd.
- Plutchik, R. (1987). *Evolutionary bases of empathy*. Cambridge: Cambridge University Press.

- Polaschek, D. L. L., & Ward, T. (2002). The implicit theories of potential rapists: What our questionnaires tell us. *Aggression and Violent Behavior, 7*, 385-406.
- Posner, M. I., Inhoff, A. W., Friedrich, F. J., & Cohen, A. (1987). Isolating attentional systems: A cognitive-anatomical analysis. *Psychobiology, 15*(2), 107-121.
- Posner, M. I., Snyder, C. R., & Davidson, B. J. (1980). Attention and the detection of signals. *Journal of Experimental Psychology, 109*(2), 160-174.
- Pratto, F., & John, O. P. (1991). Automatic vigilance: The attention-grabbing power of negative social information. *Journal of Personality and Social Psychology, 61*, 380-391.
- Preston, S. D. (2007). *A perception-action model for empathy*. Cambridge: Cambridge University Press.
- Preston, S. D., & de Waal, F. B. (2002). Empathy: Its ultimate and proximate bases. *Behavioural and Brain Sciences, 25*(1), 1-20.
- Preston, S. D., & Stansfield, R. B. (2008). I know how you feel: Task-irrelevant facial expressions are spontaneously processed at a semantic level. *Cognitive, Affective, & Behavioral Neuroscience, 8*(1), 54-64.
- Price, S. A., Beech, A. R., Mitchell, I. R., & Humphreys, G. W. (2013). Measuring deviant sexual interest using the emotional stroop task. *Criminal Justice and Behavior, 40*, 970-987.
- Price, S. A., & Hanson, R. K. (2007). A modified Stroop task with sexual offenders: Replication of a study. *Journal of Sexual Aggression, 13*(3), 203-216.
- Proctor, T., & Beail, N. (2007). Empathy and theory of mind in offenders with intellectual disability. *Journal of Intellectual and Developmental Disabilities, 32*(2), 82-93.
- Ralfs, S., & Beail, N. (2012). Assessing components of empathy in sex-offenders with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities, 25*(1), 50-59.
- Reyes, J. R., Vollmer, R., & Sloman, K. N. (2006). Assessment of deviant arousal in adult male sex offenders with developmental disabilities. *Journal of Applied Behavioural Analysis, 39*(2), 173-188.
- Ribordy, S. C., Camras, L. A., Stefani, R., & Spaccarelli, S. (1988). Vignettes for emotion recognition research and affective therapy with children. *Journal of Clinical Child Psychology, 17*(4), 1988.

- Richards, H. C., Cooper, D., Coder, R., Masnaz, J., & Anderson, A. (1992). Moral reasoning and classroom conduct: evidence of a curvilinear relationship. *Merrill-Palmer Quarterly*, 38, 176-190.
- Rogers, K., Dziobek, I., Hassenstab, J., Wolf, O. T., & Convit, A. (2007). Who cares? Revisiting empathy in Asperger Syndrome. *Journal of Autism and Developmental Disorders*, 37, 709-715.
- Salekin, K. L., Olley, J. G., & Hedge, K. A. (2010). Offenders with intellectual disability: Characteristics, prevalence, and issues in forensic assessment. *Journal of Mental Health Research in Intellectual Disabilities*, 3(2), 97-116.
- Scheerenberger, R. C. (1983). *A History of Mental Retardation*. London: Brooks Publishing Company.
- Scherer, K., Dan, E., & Flykt, A. (2010). What determines a feeling's position in affective space? A case for appraisal. *Cognition & Emotion*, 20(1), 92-113.
- Schimmack, U. (2005). Attentional interference effects of emotional pictures: Threat, negativity, or arousal? *Emotion*, 5, 55–66.
- Schmukle, S. C. (2005). Unreliability of the dot probe task. *European Journal of Personality and Individual Differences*, 19, 595-605.
- Schneider, W., Eschman, A., & Zuccolotto, A. (2002). *E-Prime: User's Guide (version 1)*. Pittsburgh: Psychological Software Tools, Inc.
- Seara-Cardoso, A., Neumann, C., Roiser, J., McCrory, E., & Viding, E. (2011). Investigating associations between empathy, morality and psychopathic personality traits in the general population. *Personality and Individual Differences*, 52, 67-71.
- Segal, Z. V., & Stermac, L. E. (1990). *The role of cognition in sexual assault*. New York: Plenum.
- Serin, R. C., & Kuriyuchuk, M. (1994). Social and cognitive deficits in violent offenders. *International Journal of Law and Psychiatry*, 17, 431–441.
- Sex Offender Treatment Services Collaborative – Intellectual Disabilities. (2010). Effectiveness of group cognitive-behavioural treatment for men with intellectual disabilities at risk of sexual offending. *Journal of Applied Research in Intellectual Disabilities*, 23, 537-551.
- Shalizi, C. (2010). The Bootstrap: Advanced Data Analysis. *American Scientist*, 98, 186-190.

- Sharma, D., & McKenna, F. P. (2001). The role of time pressure on the emotional Stroop task. *British Journal of Psychology*, *92*, 471–481.
- Siegrist, M. (1997). Test-retest reliability of different versions of the Stroop test. *Journal of Psychology*, *131*, 299-306.
- Simonian, S. J., Tarnowski, K. J., & Gibbs, J. C. (1991). Social skills and antisocial conduct of delinquents. *Child Psychiatry and Human Development*, *22*, 17-27.
- Simpson, M. K., & Hogg, J. (2001). Patterns of offending among people with intellectual disability: a systematic review. Part I: methodology and prevalence data. *Journal of Intellectual Disability Research*, *45*(5), 384–396.
- Sin, C., Mguni, N., Cook, C., Comber, N., & Hedges, A. (2010). Targeted violence, harassment and abuse against people with learning disabilities in Great Britain. *Tizard Learning Disability Review*, *15*(1), 17-27.
- Smith, A. H., Quinn, K., & Lindsay, W. R. (2000). Influence of mental illness on the presentation and management of offenders with learning disabilities. *Journal of Intellectual Disability Research*, *44*(360-361).
- Smith, P., & Waterman, M. (2003). Processing bias for aggression words in forensic and nonforensic samples. *Cognition and Emotion*, *17*(5), 681-701.
- Smith, P., & Waterman, M. (2004a). Processing bias for sexual material: the emotional stroop and sexual offenders. *Sex Abuse*, *16*(2), 163-171.
- Smith, P., & Waterman, M. (2004b). Role of experience in processing bias for aggressive words in forensic and non-forensic populations. *Aggressive Behaviour*, *30*, 105-122.
- Snarey, J. R. (1985). Cross-cultural universality of social-moral development: a critical review of Kohlbergian research. *Psychological Bulletin*, *97*(2), 202-232.
- Soderstrom, H. (2003). Psychopathy as a disorder of empathy. *European Child and Adolescent Psychiatry*, *12*(5), 249-252.
- Speer, L., Cook, A., McMahon, W. M., & Clark, E. (2007). Face processing in children with autism: Effects of stimulus contents and type. *Autism*, *11*(3), 265-277.
- Staugaard, S. R. (2009). Reliability of two versions of the dot-probe task using photographic faces. *Psychology Science Quarterly*, *51*(3), 339-350.
- Steinmetz, K. R., Muscatell, K. A., & Kensinger, E. A. (2010). The effect of valence on young and older adults' attention in a rapid serial visual presentation task. *Psychology of Aging*, *25*, 239–245.

- Stevens, J. (1996). *Applied multivariate statistics for the social sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum.
- Sturme, P., Newton, J. T., Cowley, A., Bouras, N., & Holt, G. (2005). The PAS-ADD Checklist: independent replication of its psychometric properties in a community sample. *British Journal of Psychiatry, 186*, 319-323.
- Sullivan, E. V. (1977). A study of Kohlberg's structural theory of moral development. A critique of liberal social science ideology. *Human Development, 20*(353-376).
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using Multivariate Statistics* (4th ed.). Boston: Allyn & Bacon.
- Tager-Flusberg, H., & Sullivan, K. (2000). A componential view of theory of mind: Evidence from Williams syndrome. *Cognition, 76*, 59-89.
- Tan, J., Ma, Z., Gao, X., Wu, Y., & Fang, F. (2011). Gender difference of unconscious attentional bias in high trait anxiety individuals. *PLoS One, 6*(5), e20305.
- Taylor, J. L., & Lindsay, W. R. (2010). Understanding and treating offenders with learning disabilities: a review of recent developments. *Journal of Learning Disabilities and Offending Behaviour, 1*(1), 5-16.
- Taylor, J. L., Novaco, R. W., & Johnson, L. (2009). Effects of intellectual functioning on cognitive behavioural anger treatment for adults with learning disabilities in secure settings. *Advances in Mental Health and Learning Disabilities, 3*(4), 51-56.
- Taylor, J. L., Thorne, I., Robertson, A., & Avery, G. (2002). Evaluation of a group intervention for convicted arsonists with mild and borderline intellectual disabilities. *Criminal Behaviour and Mental Health, 12*(282-293).
- Todorov, A., & Bargh, J. A. (2002). Automatic sources of aggression. *Aggressive and Violent Behaviour, 7*, 53-68.
- Tredgold, A. F. (1908). *A textbook of mental deficiency*. London: Balliere, Tindall & Cox.
- Trent, J. W. (1994). *Inventing the Feeble Mind: A History of Mental Retardation in the United States*. California: University of California Press.
- Van Doesum, N. J., Van Lange, D. A., & Van Lange, P. A. (2013). Social mindfulness: Skill and will to navigate the social world. *Journal of Personality and Social Psychology, 105*, 86-103.
- van Duijvenbode, N., Didden, R., Voogd, H., Korzilius, H. P., & Engels, R. (2012). Cognitive biases in individuals with mild to borderline intellectual disability and

- alcohol use-related problems. *Research in Developmental Disabilities*, 33, 1928-1936.
- Van Vugt, E., Gibbs, J., Stams, G. J., Bijleveld, C., Hendriks, J., & van der Laan, P. (2011). Moral development and recidivism. A meta-analysis. *International Journal of Offender Therapy and Comparative Criminology*, 55, 1234-1250.
- Vereenooghe, L., & Langdon, P. E. (2013). Psychological therapies for people with intellectual disabilities: a systematic review and meta-analysis. *Research in Developmental Disabilities*, 34(11), 4085-4102.
- Verschuere, B., Crombez, G., & Koster, E. (2001). The international affective picture system: A cross-cultural validation study. *Psychologica Belgica*, 41, 205–217.
- Vitale, J. (2011). Emotion facilitation and passive avoidance learning in psychopathic female offenders. *Criminal Justice behaviour*, 38, 641-658.
- Wadlinger, H., & Isaacowitz, D. M. (2006). Positive affect broadens visual attention to positive stimuli. *Motivation and Emotion*, 30, 89–101.
- Wagstaff, D. A., Elek, E., Kulis, S., & Marsiglia, F. (2009). Using a nonparametric bootstrap to obtain a confidence interval for Pearson's r with cluster randomized data: A case study. *Journal of Primary Prevention*, 30(5), 497-512.
- Walker, N., & McCabe, S. (1973). *Crime and Insanity in England: The historical perspective*. Edinburgh Edinburgh University Press.
- Ward, T. (2000). Sexual offenders' cognitive distortions as implicit theories. *Aggression and Violent Behavior*, 5, 491–507.
- Ward, T., Gannon, T. A., & Keown, K. (2006). Beliefs, values and action: The judgement model of cognitive distortions in sexual offenders. *Aggression and Violent Behavior*, 11, 323–340.
- Ward, T., Polaschek, D., & Beech, A. (2005). *Theories of Sexual Offending*. London: Wiley-Blackwell.
- Wastell, C. A., Cairns, D., & Haywood, H. (2009). Empathy training, sex offenders and re-offending. *Journal of Sexual Aggression*, 15, 149-159.
- Watson, N. (2006). *An investigation into cognitive bias towards visual sexual stimuli in child sexual offenders with intellectual disabilities*. University of East Anglia, Norwich, UK.



- Wechsler, D. (1997). *Wechsler Adult Intelligence Scale - 3rd Edition (WASI-III)*. San Antonio, TX: Harcourt Assessment.
- Wechsler, D. (1999). *Wechsler Abbreviated Scale of Intelligence (WASI)*. San Antonio, TX: Harcourt Assessment.
- Wechsler, D. (2008). *Wechsler Adult Intelligence Scale - 4th Edition (WAIS-IV)*. San Antonio, TX: Harcourt Assessment.
- Wechsler, D. (2011). *Wechsler Abbreviated Scale of Intelligence – 2nd Edition (WASI-II)*. Bloomington, MN: Pearson.
- Wells, A. (1997). *Cognitive therapy of anxiety disorders: a practice manual and conceptual guide*. Chichester, UK: Wiley.
- West, D. J. (1982). *Delinquency: Its Roots, Careers and Prospects*. London: Heinemann.
- Williams, J., Watts, F., MacLeod, C., & Matthews, A. (1997). *Cognitive psychology and the emotional disorders*. Chichester, UK: Wiley.
- Williams, K. (2008). *Textbook on Criminology*. Oxford: Oxford University Press.
- Williamson, S., Harpur, T. J., & Hare, R. D. (1991). Abnormal processing of affective words by psychopaths. *Psychophysiology*, 28(3), 260-273.
- Willner, P. (2007). CBT for people with intellectual disabilities: focus on anger. *Advances in Mental Health in Learning Disabilities*, 1, 14-21.
- Willner, P. (2009). Psychotherapeutic interventions in learning disability: focus on cognitive behavioural therapy and mental health. *Psychiatry*, 8(10), 416-419.
- Willner, P., Bailey, R., Parry, R., & Dymond, S. (2010). Evaluation of executive functioning in people with intellectual disabilities. *Journal of Intellectual Disability Research*, 54(4).
- Wilson, J. Q., & Herrnstein, R. J. (1985). *Crime and human nature*. New York: Simon & Schuster.
- World Health Organisation. (2001). *Mental Health: New Understanding, New Hope*. In World Health Organisation (Ed.). France.
- Wright, S. P. (1992). Adjusted p-values for simultaneous inference. *Biometrics*, 49, 1005–1013.
- Yiend, J., & Mathews, A. (2001). Anxiety and attention to threatening pictures. *Quarterly Journal of Experimental Psychology: Human Experimental Psychology*, 54s, 665–681.

- Yurgelun-Todd, D. (2007). Emotional and cognitive changes during adolescence. *Current opinion in neurobiology*, 17(2), 251-257.
- Zahn-Waxler, C., & Robinson, J. (1995). *Empathy and guilt: early origins of feelings of responsibility*. New York: Guilford Press.
- Zimmermann, P., & Fimm, B. (1993). *Test for attentional performance (TAP)*. Freiburg: Psytest.

## 6 Appendices

### **Appendix 1. Figure Reproduction Permissions (Crick and Dodge, 1994)**

Permission for figure from Crick and Dodge (1994).

Taken from: <http://www.apa.org/about/contact/copyright/index.aspx#required>

#### ***APA Copyright and Permissions Information***

##### ***Permission is Not Required for the Following:***

- *A maximum of three figures or tables from a journal article or book chapter*
- *Single text extracts of less than 400 words*
- *Series of text extracts that total less than 800 words*

*No formal requests to APA or the author are required for the items in this clause.*

## **Appendix 2. Figure Reproduction Permissions (Palmer, 2003)**

Permission for figure from Palmer (2003).

*From: Bavister, Rosemary [ROSEMARY.BAVISTER@contractor.cengage.com]  
Sent: 17 April 2014 09:50  
To: Susan Sadek (MED)  
Subject: RE: Permissions request*

*Dear Susan*

*Re: Figure 6.2 in 'Offending Behaviour: Moral Reasoning, Criminal Conduct and the Rehabilitation of Offenders'*

*Further to your recent email, permission is granted for use of the above material in your forthcoming thesis, subject to the following conditions:*

- 1. The material to be quoted/produced was published without credit to another source. If another source is acknowledged, please apply directly to that source for permission clearance.*
- 2. Permission is for non-exclusive, English language rights, and covers use in your thesis only. Any further use (including storage, transmission or reproduction by electronic means) shall be the subject of a separate application for permission.*
- 3. Full acknowledgement must be given to the original source, with full details of figure/page numbers, title, author(s), publisher and year of publication.*

*Yours sincerely*

*Rosemary Bavister  
Permissions Administrator  
Taylor & Francis Books (UK)*

*Tel: +44 (0) 1264 342781*

*Rosemary.Bavister@contractor.cengage.com*

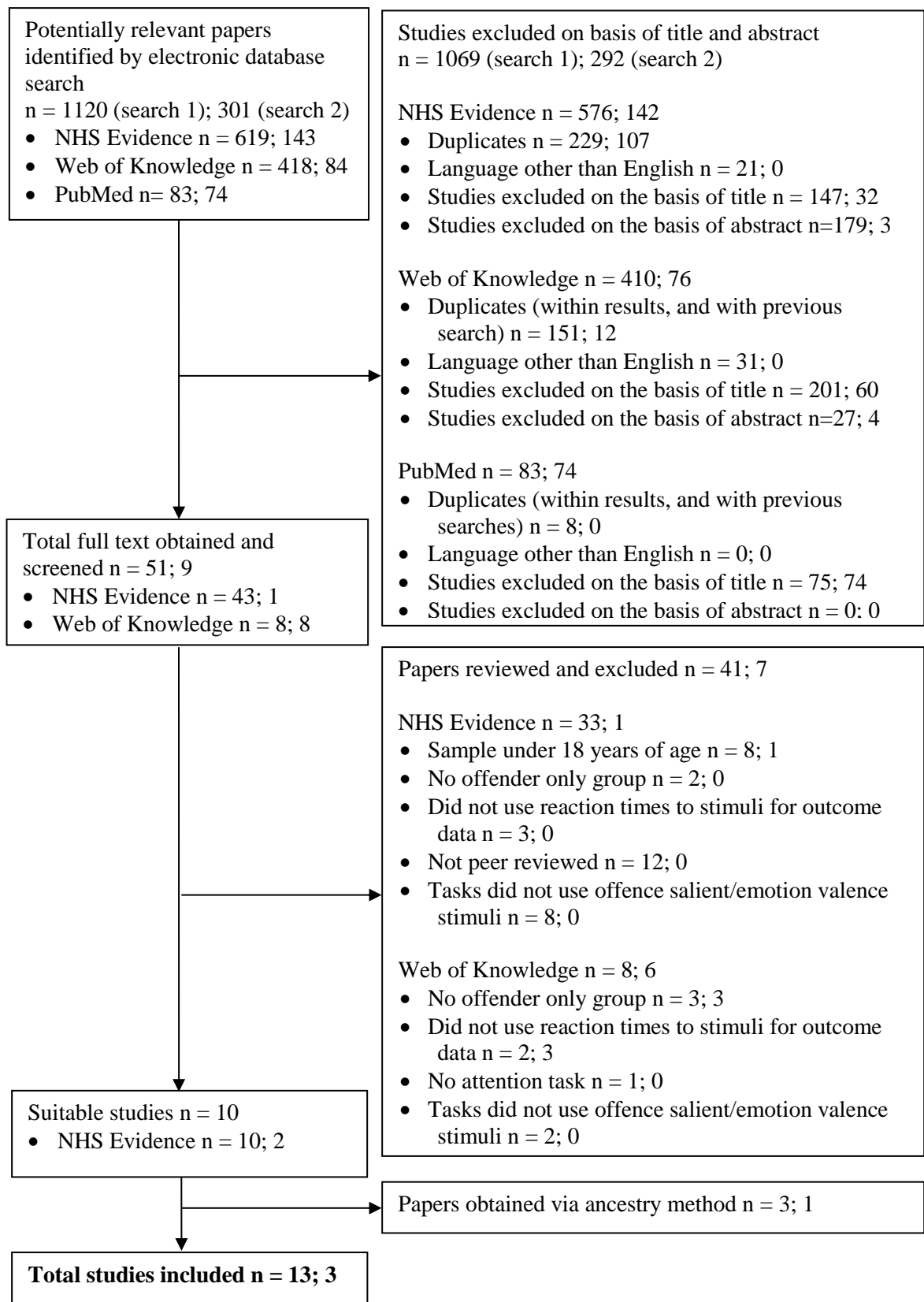
### **Appendix 3. Systematic Literature Review Screening Criteria**

1. For search one, studies must have been published from the date of database inception through to date of search (except Pubmed, where the search was for the most recent year only). For search two, studies must have been published since the date of the last search, to the date of the second search.
2. Written in English.
3. Contained at least one group of people who had been convicted of an offence.
4. Investigates attentional bias using an experimental task that yields reaction times (e.g. not just physiological data).
5. Used salient (rather than generic) stimuli, defined as either affective or offence-related stimuli.
6. Participants were aged 18 or over.
7. Were published/peer reviewed.

#### Appendix 4. Databases and Terms String for Identifying Articles

	<b>NHS Evidence</b>	<b>Web of Science</b>	<b>PubMed</b>
<b>Date searched</b>	Inception to July week 2 2012 (search 1); 2012 to week 4 2014 (search 2)	Inception to August week 2 2012 (search 1); Start 2012 to week 4 2014 (search 2)	August week 4 2011 to August week 4 2012 (search 1); August week 4 2012 to week 4 2014 (search 2)
<b>Databases searched</b>	AMED, CINAHL, HMIC, EMBASE, PsychInfo, BNI, Medline	Medline, BIOSIS, Citation Index	Medline
<b>Search terms</b>	<b>Number of hits</b>		
#1. Offend*	54,694; 7,130	34,169; 3,514	797; 736
#2. Delinqu*	31,553; 2,107	25,756; 1,597	330; 317
#3. Crim*	116,219; 13,922	131,162; 304	2,381; 2,484
#4. Forens*	72,826; 12,353	1195,98; 10,893	3,424; 2,750
#5. Convic*	23,736; 2,357	14,833; 1,422	267; 226
#6. Prison*	47,557; 5,218	47,579; 3,281	830; 946
#7. Incarcerat*	22,016; 3,662	15,391; 1,464	501; 371
#8. Correctional	10,447; 1,270	6,376; 504	147; 141
#9. Probation*	6,883; 633	3,751; 303	76; 52
#10. Inmate	15,345; 328	8,769; 678	32; 31
#11. Detain*	6,716; 3,662	4,294; 450	121; 114
#12. Detent*	8,135; 1,087	8,713; 849	124; 102
#13. #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12	314,881; 37,860	344,069; 23,009	7,117; 6,053
#14. Atten* Bias*	4,612; 1637	4,790; 747	951; 795
#15. Select* Atten*	14,734; 2215	19,430; 1,923	4,741; 3,121
#16. Info* Process*	52,497; 7442	6,1057; 4,313	1,806; 1,686
#17. Emo* Process*	9,781; 3436	7,906; 1,117	37; 23
#18. Process* Bias*	11,306; 389	598; 170	1,863; 1,265
#19. #14 OR #15 OR #16 OR #17 OR #18	80296; 14,379	91,018; 7741	8,791; 5,814
#20. #13 AND #19	619; 143	418; 84	83; 74
<b>Abstracts retrieved</b>	619; 143	418; 84	83; 74

## Appendix 5. Study Selection and Exclusion Process



## Appendix 6. Staff Information Sheet

**Department of Psychological Sciences  
Norwich Medical School**



University of East Anglia  
Norwich NR4 7TJ England  
Telephone: 01603 593599  
Fax: 01603 593604  
Email:  
P.Langdon@uea.ac.uk

**How do people with learning disabilities understand what is right and wrong?**

### *Information for Professionals*

#### **Who is involved in the study?**

This research is funded by the National Institute of Health Research. It is being run by the University of East Anglia, across the East of England.

#### **Who are the researchers?**

Dr Peter Langdon, Clinical Senior Lecturer, University of East Anglia

**P.Langdon@uea.ac.uk**

Susan Sadek, Trainee Clinical Psychologist, University of East Anglia

**S.Sadek@uea.ac.uk**

Matthew Daniel, Trainee Clinical Psychologist, University of East Anglia

**Matthew.Daniel@uea.ac.uk**

#### **What is the aim of the study?**

To better understand the factors which may explain offending behaviour in men with intellectual disabilities. Previous research has shown that an ability to see other people's perspectives (empathy), determining right from wrong (moral reasoning) and the way people process and understand the world (cognition) are important factors. This study aims to investigate the way these concepts, and how they interact with each other.

#### **Which service users can be involved in the research?**

1. **Men**, aged **18 – 65**
2. With a **mild intellectual disability**
3. Who have the **capacity to consent** to taking part in research

Participants are being recruited from NHS and independent sector secure forensic services, and day services and community intellectual disability teams.



## What happens in the study?

Researchers get in contact with teams who may have eligible service users, to discuss the research with staff



Staff can give service users an information sheet, and ask them if they would like to talk to the researchers



If service users say they would be interested in taking part, staff can then inform the researcher



The researcher will arrange a time to visit the service user. They will explain the study further, answer questions, and ensure that information sheets have been read and understood. The full research assessment will take approximately 2 hours.



The researcher will meet the service user again, two weeks later for a follow up appointment. This will take 15 minutes.



Participants will be reimbursed with a £20 shopping voucher for their time

## Appendix 7. Participant Information Sheet

**Department of Psychological Sciences  
Norwich Medical School**

---



University of East Anglia

University of East Anglia  
Norwich NR4 7TJ England  
Telephone: 01603 593599  
Fax: 01603 593604  
Email:  
P.Langdon@uea.ac.uk

### INFORMATION SHEET



**Study Title: How do people with learning disabilities understand what is right or wrong?**

You are being asked to take part in research.

**IF YOU WOULD LIKE SOMEONE ELSE TO BE PRESENT WHILE WE TALK ABOUT THIS, PLEASE TELL ME. YOU CAN HAVE AN ADVOCATE, FRIEND, KEYWORKER, OR SOMEONE ELSE COME IN AND TALK WITH US.**

You can talk to others about this research study if you want to. This can be anyone you like.

Please ask if there is anything that you do not understand.

## Who are the Researchers?



Dr Peter Langdon Clinical Clinical Psychologist University of East Anglia	Susan Sadek Trainee Clinical Psychologist, University of East Anglia	Matthew Daniel Trainee Clinical Psychologist, University of East Anglia
---	--	---

### We want to find out:



- how people with a learning disability understand why some things are right or wrong.
- how people with a learning disability pay attention to different types of pictures



### Do I have to take part in this research?

- NO, you do not have to take part in this research.
- If you say YES, you can change it to NO later on.



### IMPORTANT

- If you say YES, Peter, Susan or Matthew will contact you to arrange a time to meet.
- We will ask you to do a task on the computer which involves looking at pictures and pressing special keys on a box.
- We will ask you some questions about how you feel about different things like obeying the law. We will come back in about two weeks and ask you some questions a second time.
- You may have to do some puzzles and some tasks in order to help us understand what sorts of things you are good at doing. If you have done these puzzles and tasks before, you do not have to do them again. We can get this information from your notes.
- We will ask you if you have ever been in trouble with the police.
- YOU SHOULD NOT TELL PETER, SUSAN OR MATTHEW ABOUT THINGS YOU MAY HAVE DONE THAT ARE AGAINST THE LAW THAT OTHER PEOPLE DO NOT KNOW ABOUT.
- IF YOU DO, PETER, SUSAN OR MATTHEW MAY TELL SOMEONE ELSE, AND YOU MAY GET INTO TROUBLE.
- THIS MEANS THAT YOU SHOULD ONLY TELL PETER, SUSAN OR MATTHEW ABOUT THINGS YOU HAVE DONE WHICH YOU HAVE ALREADY BEEN IN TROUBLE FOR.
- You will be asked for permission to look at the information the NHS and Social Services has about you.



### **Payment**

- We will give you a shopping voucher for £20.00



### **How long will it take?**

- About two hours. You can take a break half way through if you like.
- We will come back in about two weeks and ask you some questions again. This will take about 30 minutes.



### **Could bad things happen if I do the research?**

- Some of the pictures we will show you on the computer are not very nice.
- Some will show people in pain, and will contain blood. Not all of the pictures are like this. They will only appear on the computer very quickly - for less than one second at a time.
- If you do not like the pictures and decide you want to stop, that is ok.
- You may think some of the questions are silly, but we would like you to try to answer them as best as you can.
- If anything upsets you, we can stop, and you can talk to Peter, Susan or Matthew, or you can talk to someone else.



### **Could good things happen if I do the research n?**

- By saying YES you might help us to understand how people with learning disabilities understand why some things are right and some things are wrong. You might also help us to understand why some people look at pictures in different ways.



### **Will information about me be kept private?**

- Yes, but:
  - We will tell your care team if you tell us things that mean you or someone else is at risk. This is to protect you and other people.
  - We may look at your records. We will ask you if this is okay.
  - People who are in charge of making sure that the researchers are following the rules may also look at your records and the information they collect about you.



### What happens at the end?

- The results will be written about. No names will be given.



### Who is organising and giving money for the research?

- The National Institute for Health Research (NIHR) is paying for the research.



### Has the research been checked?

- People have looked at the study to check it is safe.
- People have also checked to make sure that everyone gets good information before they start.



### What if you are unhappy about the research?

- You can talk to the researchers first if you like.
- You can make a complaint to the University of East Anglia or the NHS.
- We will give you information about how to complain.
- You may want a key worker to help you make a complaint.
- If you are harmed, you may be able to take legal action against the University of East Anglia or the NHS, but you may have to pay for this.



### Contacts:

- If you want any extra information, or you wish to complain, you or your key worker can call (Monday to Friday) or write to:

**Dr. Peter Langdon, Clinical Senior Lecturer/Honorary Consultant Clinical Psychologist**

His phone number is: 01603 593599

or:

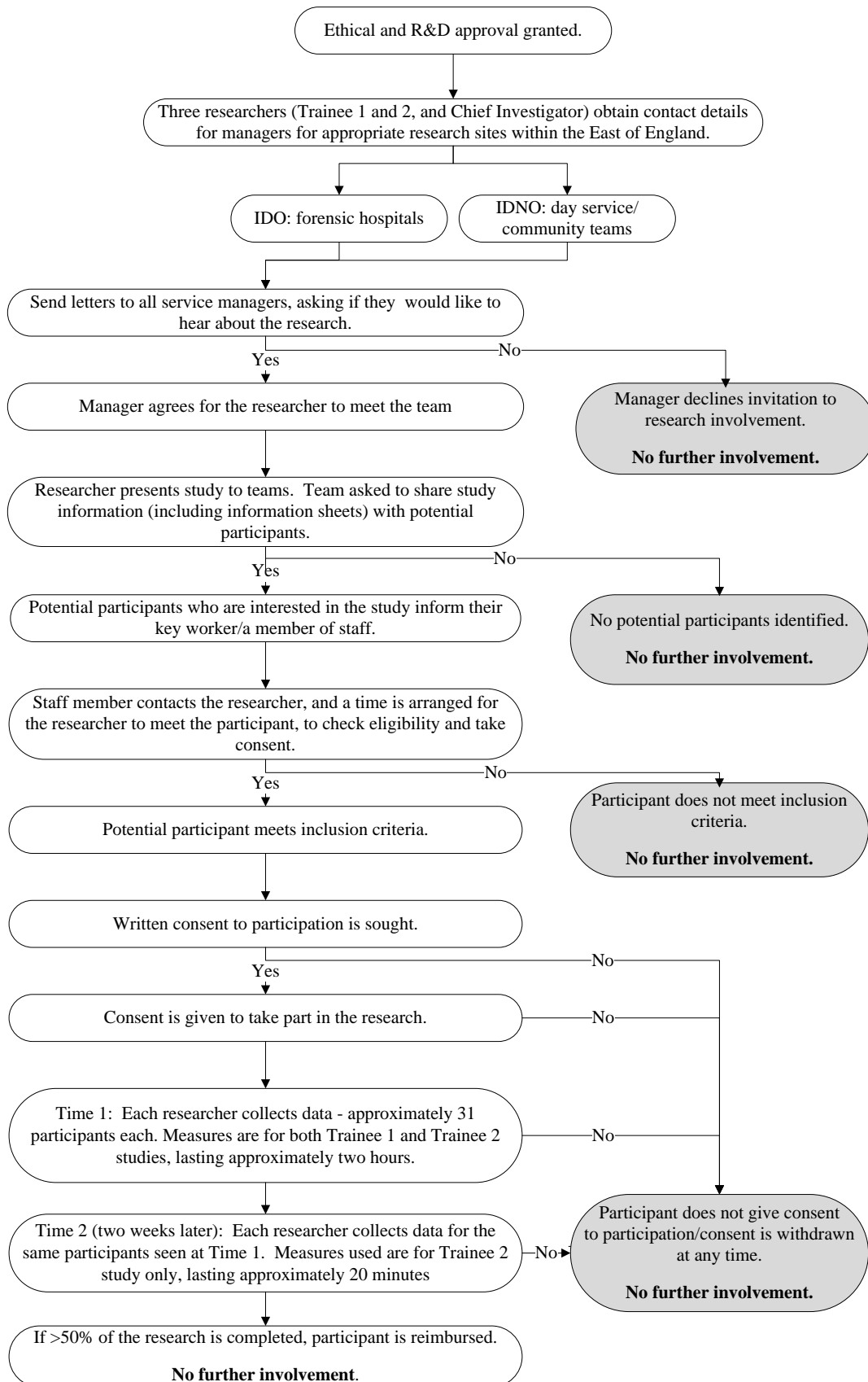
Ms Susan Sadek or Mr Matthew Daniel.

Their telephone number is 01603 593177

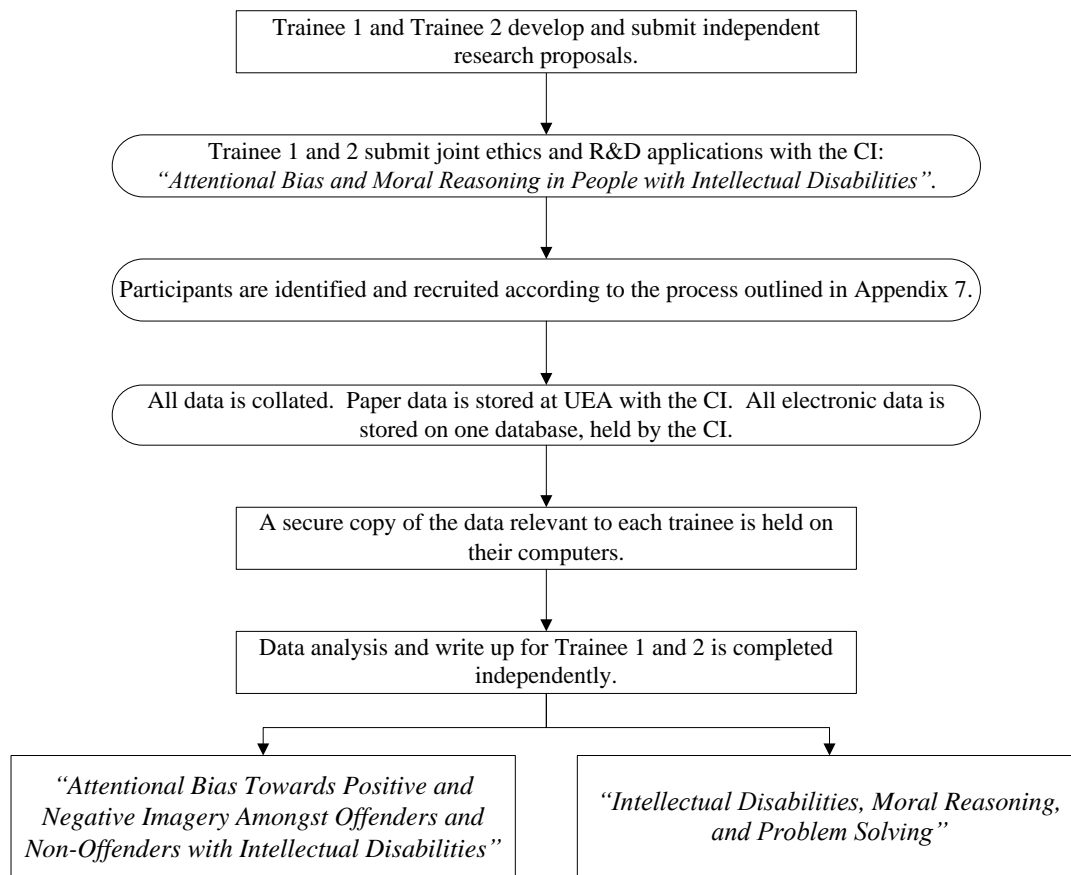
Their address is:

Department of Psychological Sciences  
Norwich Medical School  
University of East Anglia  
Norwich Research Park  
Norwich NR4 7TJ


## Appendix 8. Flow Chart to Show Recruitment Procedure

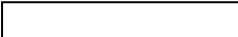


## Appendix 9. Flow Chart to Show Two Trainees Involvement in the Research



### Key

 = Trainees together

 = Trainees independently

**Appendix 10. Data Collection Pack**

**Doctoral Programme in Clinical Psychology  
Department of Psychological Sciences  
Norwich Medical School**



**University of East Anglia**

Norwich NR4 7TJ  
England

**STUDY TITLE: Developing measures and exploring relationships between empathy, reasoning and problem solving with men with intellectual disabilities who have forensic mental health problems**

**Data Collection Pack**

**TIME 1**

PARTICIPANT IDENTIFICATION NUMBER	<input type="text"/>
---	----------------------

**Date of Assessment:** \_\_\_\_\_

**Name of Researcher:** \_\_\_\_\_



## 1. INITIAL SCREENING AND DEMOGRAPHIC QUESTIONNAIRE

“I just need to collect some background information about you by asking your some simple questions”

1. “What is your date of birth?”
- 

2. “What is your ethnic group?”

Choose ONE section from A to E, then tick the appropriate box to indicate your ethnic group.

**A : White**

- British
- Irish
- Any other White background (please state)

**B : Mixed**

- White and Black Caribbean
- White and Black African
- White and Asian
- Any other mixed background (please state)

**C : Asian or Asian British**

- Indian
- Pakistani
- Bangladeshi
- Any other Asian background (please state)

**D : Black or Black British**

- Caribbean
- African
- Any other Black background (please state)

**E : Chinese or other ethnic group**

- Chinese
- Any other (please state)

**F. Not stated**

- Not stated

3. "Are you married, single, living with someone, widowed or divorced?"

---

---

4. "Do you have any children?"

---

---

5. "What sort of school did you go to? Was it a special school or a mainstream school, or a learning support unit, or did you receive any extra help?"

---

---

---

---

6. "What's the highest level of education you have finished?"

---

7. "Do you have any serious problems with your physical health?"

---

---

---

---

8. "Do you have any problems with your mental health?"

---

---

---

---

“I would like to ask you if you have ever committed a crime that someone else, like a police officer, social worker, or doctor already knows about. Do not tell me about crimes that are still secret to you. If you do, I will have to tell somebody else about them. This could be the police.”

“Have you ever been charged, cautioned or convicted of a criminal offence before? I do not mean minor traffic offences.”

“Have you ever been in trouble because you did something you should not have which the police talked to you about?”

YES

NO

If yes, “What have you been in trouble for?”

---

---

---

---

---

---

If yes, “Are you happy for me to see you again in the future?”

YES

NO

9. “Do you receive any help or support from the Learning Difficulties Team?”

8.1. “Is there anyone who helps you to do things through-out the day?  
Like a support worker or a carer?”

YES

NO

8.2. “What sorts of things do they help with?”

---

---

---

---

## PART A:

### 1. DOT-PROBE TASK

*Data recorded through computer task.*

### 2. GLASGOW ANXIETY SCALE FOR PEOPLE WITH INTELLECTUAL DISABILITIES

*I would like to talk to you about how you have been feeling just recently. First, it would help if you could tell me something you did last . . . state a day of the week/about a week ago.' (Provide prompts as necessary or ask a carer)*

*I am going to ask you some questions about how you have been feeling since [the anchor event] over the past week. There is no right or wrong answer; it is just about how you feel. If I have not explained something clearly, please ask me to tell you what I mean. For each question, I will ask you if you have 'never felt like this', 'sometimes felt like this' or 'always felt like this'. Demonstrate these responses using cue cards. Check that the participant understands the concepts using everyday examples (e.g. 'Do you like to go to the cinema?').*

*Each question should be asked in two parts. First, the participant is asked to choose between a 'yes' and 'no' answer. Use the symbols, if necessary. If their answer is 'no', the score in that column ('0' or '2') should be recorded. If their answer is 'yes', they should be asked if that is 'sometimes' or 'always', and the score recorded as appropriate. Some respondents will be able to use the three-point scale from the start, others might learn the 'rules' as you proceed. Supplementary questions (italics) may be used if the primary question is not understood completely. If a response is unclear, ask for specific examples of what the participant means, or talk with them about their answer until you feel able to allocate it to a response category.*

In the last week...?		Never/ No	Some- times	Always/ a lot
<i>Worries</i>				
<b>1</b>	Do you worry a lot? (...feel worked up/wound up/uptight)	0	1	2
<b>2</b>	Do you have lots of thoughts that go round in your head? (...thoughts that you can't stop/come from nowhere)	0	1	2
<b>3</b>	Do you worry about your parents/family?	0	1	2
<b>4</b>	Do you worry about what will happen in the future? (tailored to the individual; e.g. what will happen if you can't live with your mum anymore?)	0	1	2
<b>5</b>	Do you worry that something awful might happen?	0	1	2

<b>6</b>	Do you worry if you do not feel well? ( <i>...if you feel sick</i> )	0	1	2
<b>7</b>	Do you worry when you are doing something new? ( <i>...for the first time</i> )	0	1	2
<b>8</b>	Do you worry about what you are doing tomorrow?	0	1	2
<b>9</b>	Can you stop worrying? (reverse score)	0	1	2
<b>10</b>	Do you worry about death/dying?	0	1	2
<i>Specific fears</i>				
<b>11</b>	Do you get scared in the dark? ( <i>...think of being in bed with the lights out: would you be scared?</i> )	0	1	2
<b>12</b>	Do you feel scared if you are high up? ( <i>...think of being up a high building...</i> )	0	1	2
<b>13</b>	Do you feel scared in lifts or escalators? ( <i>Would you go in?</i> )	0	1	2
<b>14</b>	Are you scared of dogs? ( <i>Would you stroke/clap?</i> )	0	1	2
<b>15</b>	Are you scared of spiders? ( <i>Would you go near?</i> )	0	1	2
<b>16</b>	Do you feel scared going to see the doctor or dentist?	0	1	2
<b>17</b>	Do you feel scared meeting new people?	0	1	2
<b>18</b>	Do you feel scared in busy places? ( <i>...like crowds, shopping centre</i> )	0	1	2
<b>19</b>	Do you feel scared in wide open spaces? ( <i>...nothing round you</i> )	0	1	2
<i>Physiological symptoms</i>				
<b>20</b>	Do you ever feel very hot or sweaty? ( <i>...all hot and bothered</i> )	0	1	2
<b>21</b>	Does your heart beat faster?	0	1	2
<b>22</b>	Do your hands and legs shake?	0	1	2
<b>23</b>	Does your stomach ever feel funny, like butterflies?	0	1	2
<b>24</b>	Do you ever feel breathless? ( <i>...hard to breathe/out of breath</i> )	0	1	2
<b>25</b>	Do you feel like you need to go to the toilet more than usual? ( <i>...for a 'pee'</i> )	0	1	2
<b>26</b>	Is it difficult to sit still? ( <i>...feel you can't sit at peace</i> )	0	1	2
<b>27</b>	Do you feel panicky? ( <i>...get into a panic/a 'state'</i> )	0	1	2

### 3. GLASGOW DEPRESSION SCALE FOR PEOPLE WITH INTELLECTUAL DISABILITIES

*'I am going to ask you about how you have been feeling since [anchor event last week]. Just between . . . and now, OK. There is no right or wrong answer - I just want to know how you have been feeling. If I don't explain things well enough, just ask me to tell you what I mean.*

In the last week . . .		Never/ No	Some- times	Always/ a lot
1	Have you felt sad? <i>Have you felt upset?</i> <i>Have you felt miserable?</i> <i>Have you felt depressed?</i>	0	1	2
2	Have you felt as if you are in a bad mood? <i>Have you felt bad-tempered?</i> <i>Have you felt as if you want to shout at people?</i>	0	1	2
3	Have you enjoyed the things you have done? <i>Have you had fun?</i> <i>Have you enjoyed yourself?</i>	0	1	2
4	Have you enjoyed talking to people and being with other people? <i>Have you liked having people around you?</i> <i>Have you enjoyed other people's company?</i>	0	1	2
5	Have you made sure you have washed yourself, worn clean clothes, brushed your teeth and combed your hair? <i>Have you taken care of the way you look?</i> <i>Have you looked after your appearance?</i>	0	1	2
6	Have you felt tired during the day? <i>Have you gone to sleep during the day?</i> <i>Have you found it hard to stay awake during the day?</i>	0	1	2
7	Have you cried?	0	1	2
8	Have you felt you are a horrible person? <i>Have you felt others don't like you?</i>	0	1	2
9	Have you been able to pay attention to things (such as watching TV)? <i>Have you been able to concentrate on things (like television programmes)?</i> <i>What is your favourite [television</i>	0	1	2

	<i>programme]? Are you able to watch it from start to finish?</i>			
<b>10</b>	Have you found it hard to make decisions? <i>Have you found it hard to decide what to wear, or what you would like to eat, or do? Have you found it hard to choose between two things? [Give concrete example if required.]</i>	0	1	2
<b>11</b>	Have you found it hard to sit still? <i>Have you fidgeted when you are sitting down? Have you been moving about a lot, like you can't help it?</i>	0	1	2
<b>12</b>	Have you been eating too little? <i>Have you been eating too much? Do people say you should eat more/less? [Positive response for eating too much OR too little is scored.]</i>	0	1	2
<b>13</b>	Have you found it hard to get a good night's sleep? <i>[Ask questions to clarify information. If a positive response is given to one of the following, score positively.] Have you found it hard to fall asleep at night? Have you woken up in the middle of the night and found it hard to get back to sleep? Have you woken up too early in the morning? [Clarify time.]</i>	0	1	2
<b>14</b>	Have you felt that life is not worth living? <i>Have you wished you could die? Have you felt you do not want to go on living?</i>	0	1	2
<b>15</b>	Have you felt as if everything is your fault? <i>Have you felt as if people blame you for things? Have you felt that things happen because of you?</i>	0	1	2
<b>16</b>	Have you felt that other people are looking at you, talking about you, or laughing at you? <i>Have you worried about what other people think of you?</i>	0	1	2
<b>17</b>	Have you become very upset if someone says you have done something wrong or you have made a mistake?	0	1	2

	<p><i>Do you feel sad if someone tells you . .  .gives you a row?  Do you feel like crying if someone tells  you . . ./gives you a row?</i></p>			
<b>18</b>	<p><i>Have you felt worried?  Have you felt nervous?  Have you felt tense/wound up/on edge?</i></p>	0	1	2
<b>19</b>	<p><i>Have you thought that bad things keep  happening to you?  Have you felt that nothing nice ever  happens to you anymore?</i></p>	0	1	2
<b>20</b>	<p><i>Have you felt happy when something good  happened?  [If nothing good has happened in the past  week]  If someone gave you a nice present,  would that make you happy?</i></p>	0	1	2



#### 4. EMPATHY QUOTIENT (EQ)

This version has 40 items (the 20 filler items have been removed).

		Strongly agree	Slightly agree	Slightly disagree	Strongly disagree
1	I can easily tell if someone else wants to enter a conversation.	2	1	0	0
2	I find it difficult to explain to others things that I understand easily, when they don't understand it first time.	0	0	1	2
3	I really enjoy caring for other people.	2	1	0	0
4	I find it hard to know what to do in a social situation.	0	0	1	2
5	People often tell me that I went too far in driving my point home in a discussion.	0	0	1	2
6	It doesn't bother me too much if I am late meeting a friend.	0	0	1	2
7	Friendships and relationships are just too difficult, so I tend not to bother with them.	0	0	1	2
8	I often find it difficult to judge if something is rude or polite.	0	0	1	2
9	In a conversation, I tend to focus on my own thoughts rather than on what my listener might be thinking.	0	0	1	2
10	When I was a child, I enjoyed cutting up worms to see what would happen.	0	0	1	2
11	I can pick up quickly if someone says one thing but means another.	2	1	0	0
12	It is hard for me to see why some things upset people so much.	0	0	1	2
13	I find it easy to put myself in somebody else's shoes.	2	1	0	0
14	I am good at predicting how someone will feel.	2	1	0	0
15	I am quick to spot when someone in a group is feeling awkward or uncomfortable.	2	1	0	0
16	If I say something that someone else is offended by, I think that that's their problem, not mine.	0	0	1	2
17	If anyone asked me if I like their haircut, I would reply truthfully, even if I didn't like it.	0	0	1	2
18	I can't always see why someone should have felt offended by a remark.	0	0	1	2
19	Seeing people cry doesn't really upset me.	0	0	1	2

<b>20</b>	I am very blunt, which some people take to be rudeness, even though this is unintentional.			1	2
<b>21</b>	I don't tend to find social situations confusing.	2	1	0	0
<b>22</b>	Other people tell me I am good at understanding how they are feeling and what they are thinking.	2	1	0	0
<b>23</b>	When I talk to people, I tend to talk about their experiences rather than my own.	2	1	0	0
<b>24</b>	It upsets me to see animals in pain.	2	1	0	0
<b>25</b>	I am able to make decisions without being influenced by people's feelings.	0	0	1	2
<b>26</b>	I can easily tell if someone else is interested or bored with what I am saying.	2	1	0	0
<b>27</b>	I get upset if I see people suffering on news programmes.	2	1	0	0
<b>28</b>	Friends usually talk to me about their problems as they say I am very understanding.	2	1	0	0
<b>29</b>	I can sense if I am intruding, even if the other person doesn't tell me.	2	1	0	0
<b>30</b>	People sometimes tell me that I have gone too far with teasing.	0	0	1	2
<b>31</b>	Other people often say that I am insensitive, though I don't always see why.	0	0	1	2
<b>32</b>	If I see a stranger in a group, I think that it is up to them to make an effort to join in.	0	0	1	2
<b>33</b>	I usually stay emotionally detached when watching a film.	0	0	1	2
<b>34</b>	I can tune into how someone else feels rapidly and intuitively.	2	1	0	0
<b>35</b>	I can easily work out what another person might want to talk about.	2	1	0	0
<b>36</b>	I can tell if someone is masking their true emotion.	2	1	0	0
<b>37</b>	I don't consciously work out the rules of social situations.	2	1	0	0
<b>38</b>	I am good at predicting what someone will do.	2	1	0	0
<b>39</b>	I tend to get emotionally involved with a friend's problems.	2	1	0	0
<b>40</b>	I can usually appreciate the other person's viewpoint, even if I don't agree with it.	2	1	0	0

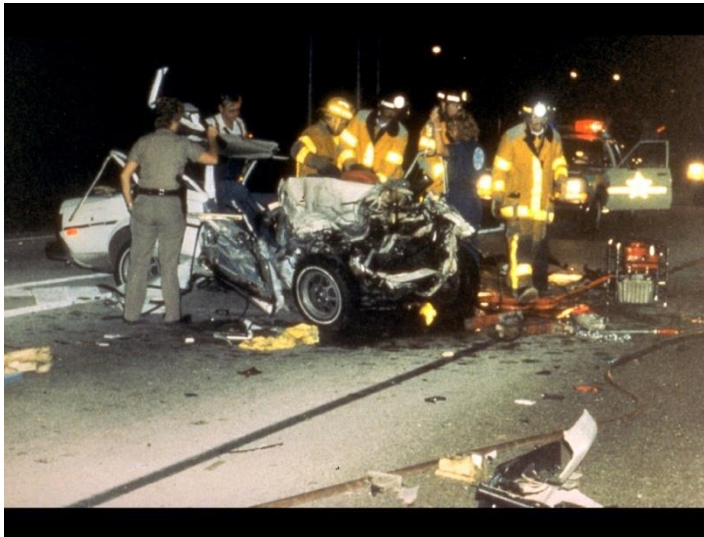
**Appendix 11. Images for the Dot-Probe Task**

Negative-affective images (1)





Negative-affective images (2)





Neutral-affective images (1)



Neutral-affective images (2)





Positive-affective images (1)



Positive-affective images (2)





**Appendix 12. Practice Images for the Dot-Probe Task**



**Appendix 13. Consent Form**

**Department of Psychological Sciences  
Norwich Medical School**



Telephone 01603 593599  
Fax 01603 593604  
Email P.Langdon@uea.ac.uk

**CONSENT FORM FOR RESEARCH**

**Participant identification number:**

**Study title:**

How do people with learning disabilities understand what is right and wrong?

**Name of researchers**

Susan Sadek, Trainee Clinical Psychologist  
Matthew Daniel, Trainee Clinical Psychologist  
Dr Peter Langdon, Clinical Senior Lecturer & Honorary Consultant Clinical Psychologist

**Please initial or tick ✓ the box if you agree with the sentence.**

I confirm an advocate/key-worker was actually present when the study was explained to me.

I understand the information sheet dated 18 October 2012 (Version 2.0) for this study, explained to me by \_\_\_\_\_

I have asked any questions I wanted.

I understand that I can leave the research at any time (even while doing the questionnaires) without giving a reason.

I agree for the research team to look at my clinical notes

I agree for my key worker to know I am taking part

I understand that if I tell the researchers about offences which no one else knows about then they may tell other people about them (e.g. the police, my doctor, or my social worker).

I understand that people from the NHS may check the information collected by the researchers to make sure they are following the rules. I agree to this.

I agree to take part in the research.

I would like to be contacted in the future to take part in other studies.

*If you tick this box, we will keep your name and address, but this will remain secret. We may get in touch and ask you if you would like to do a new study. However, you can say no at any point.*

\_\_\_\_\_  
Name of Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

My address is:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

My telephone number is:

\_\_\_\_\_

\_\_\_\_\_  
Name of Witness (If Present)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Name of Researcher

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

## Appendix 14. Visual Analogue Scale

(For use with the GDS-ID and GAS-ID)

 Never/No
 Sometimes
 Always/A lot

(For use with the EQ)



Strongly agree



Slightly agree



Slightly disagree



Strongly disagree

## Appendix 15. Favourable Ethical Opinion



### Health Research Authority

NRES Committee South West - Frenchay

Bristol Research Ethics Committee Centre

Level 3, Block B

Whitefriars

Lewins Mead,

Bristol

BS1 2NT

Telephone: 01173421334

Facsimile: 01173420445

15 May 2013

Dr Peter Langdon  
Clinical Senior Lecturer/Honorary Consultant Clinical & Forensic Psychologist  
University of East Anglia  
Department of Psychological Sciences  
Norwich Medical School, University of East Anglia  
Norwich Research Park, Norwich  
NR4 7TJ

Dear Dr Langdon

**Study title:** Developing measures and exploring relationships between empathy, reasoning and problem solving with men with intellectual disabilities who have forensic mental health problems.

**REC reference:** 13/SW/0084

**Protocol number:** 1

**IRAS project ID:** 117923

Thank you for your letter of 30 April 2013, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

We plan to publish your research summary wording for the above study on the NRES 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 Co-ordinator Miss Christine Hobson, [nrescommittee.southwest-frenchay@nhs.net](mailto:nrescommittee.southwest-frenchay@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).

### Non-NHS sites

### 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>.

*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*

**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:

Document	Version	Date
Covering Letter		18 March 2013
Evidence of Insurance or Indemnity		15 May 2012
Investigator CV		
Other: Student CV		
Other: Student CV		



Other: Dot - Probe Images	2	30 April 2013
Other: Data Collection Pack Time 1	2	30 April 2013
Other: Data Collection Pack Time 2	2	30 April 2013
Participant Consent Form	2	30 April 2013
Participant Information Sheet: professionals	1	18 October 2012
Participant Information Sheet	2	30 April 2013
Protocol	3	02 May 2013
Questionnaire: Validated: Social Reflection Questionnaire		
REC application		21 March 2013
Referees or other scientific critique report		
Response to Request for Further Information		30 April 2013

#### 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

13/SW/0084	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



Dr Robert Beetham  
Chair

Email: [nrescommittee.southwest-frenchay@nhs.net](mailto:nrescommittee.southwest-frenchay@nhs.net)

Enclosures: "After ethical review – guidance for researchers"

Copy to: Mrs Yvonne Kirkham  
Ms Clare Symms, NHS Norfolk

## Appendix 16. Local NHS Permissions

Norfolk Community   
Health and Care  
NHS Trust

Ref: 2013LD02 (117923)

**Norfolk & Suffolk Primary & Community Care Research Office**  
Hosted by: South Norfolk CCG

Dr Peter Langdon  
Department of Psychological Sciences  
Norwich Medical School  
University of East Anglia  
Norwich  
NR4 7TJ

Lakeside 400  
Old Chapel Way  
Broadland Business Park  
Thorpe St Andrew  
Norwich  
NR7 0WG

Tel: 01603 257283

Fax: 01603 257292

20 May 2013

E-mail: [paul.mills1@nhs.net](mailto:paul.mills1@nhs.net)

<http://www.southnorfolkccg.nhs.uk/info.aspx?p=8>

Dear Dr Langdon

**Re: 2013LD02 (117923). Developing measures and exploring relationships between empathy, reasoning and problem solving with men with intellectual disabilities who have forensic mental health problems.**

**REC Number: 13/SW/0084**

**Chief Investigator: Dr Peter Langdon**

**Sponsor: University of East Anglia**

Further to your submission of the above project through NIHR CSP your project has now been reviewed in accordance with the NIHR CSP Operating Guidelines and all the mandatory research governance checks have now been satisfied. I am therefore pleased to inform you on behalf of Norfolk Community Health & Care NHS Trust that NHS permission (R&D approval) was granted on 20<sup>th</sup> May 2013 for your study to take place at the following sites:

- Learning Disabilities Service, Norfolk Community Health & Care NHS Trust

Please note the following condition of approval:

- Please ensure that Norfolk Community Health & Care NHS Trust staff record verbal consent to pass contact details to the study team in the patient's medical notes.
- Please ensure that the LD service at NCH&C are informed if any participants from NCH&C exhibit any distress during the study so that any support needed can be put in place.

It is noted that there were a number of minor errors on the REC letter of favourable opinion, which you have highlighted to the REC. If this letter is reissued, please ensure a copy is sent through to us to update our records.

You may now begin your study at the above sites. Please note also, if you wish to extend approval to any sites other than those listed above you must apply for this through NIHR CSP.

NHS Permission is granted on the basis of the information supplied in the application form, protocol and supporting documentation, if anything subsequently comes to light that would cast doubts upon,

---

Chairman: Ken Applegate

Chief Executive: Michael Scott

Norfolk Community Health and Care NHS Trust Head Office: Elliot House, 130 Ber Street, Norwich, Norfolk NR1 3FR

*The Norfolk & Suffolk Primary & Community Care Research Office, hosted by South Norfolk CCG, undertakes research management, design and delivery services for Primary and Community Care across Norfolk & Suffolk*

or alter in any material way, any information contained in the original application, or a later amendment application there may be implications for continued NHS Permission.

Permission is granted on the understanding that the study is conducted in accordance with the Research Governance Framework and the terms of REC favourable opinion.

If you have any queries regarding this or any other project please contact Paul Mills, R&D Officer, at the above address. Please note, the reference number for this study is 2013LD02 (117923) and this should be quoted on all correspondence.

Yours sincerely



Clare Symms  
Research Governance Manager, Norfolk & Suffolk Primary & Community Care Research Office  
*Signed on behalf of Norfolk Community Health & Care NHS Trust*

cc: Yvonne Kirkham, University of East Anglia, Sponsor Representative  
File

#### Conditions of NHS Permission

Please note the following conditions of NHS Permission - it is your responsibility to ensure that these conditions are disseminated to all parties involved in this project at the above sites.

#### You must notify the Norfolk & Suffolk Primary & Community Care Research Office of:

- All proposed changes to this study, whether minor or substantial
- All Serious Adverse Events relevant to the above sites
- Any deviations from the protocol or protocol breaches including any urgent safety measures that are required to be taken in order to protect research participants against any immediate hazard to their health or safety
- All incidents<sup>1</sup> or complaints in relation to the research project at the above sites
- Any Sponsor or funder initiated audits, or any regulatory inspections to be conducted in relation to this study at the above sites
- The study conclusion and/or termination of the study; where smartcards have been issued, this notification must be made on a site by site basis to allow deactivation of smartcards at that site.
- All publications relating to the study

#### Recruitment of Community Teams:

You are responsible for ensuring an appropriate assessment is made of the suitability and capacity of community teams to undertake the study at the point they are recruited.

- You are expected to put in place an agreement or delegation of authority to ensure clarity of roles and responsibilities between yourself and the site as necessary.
- You are responsible for oversight of the project at each participating site to ensure compliance with the protocol and any study related SOPs or work instructions

#### Payment of Support Funding:

You are required to provide details of study activity on an ongoing basis in the format specified by the Norfolk & Suffolk Primary & Community Care Research Office to enable quarterly payment of support funding.

#### Documentation:

---

<sup>1</sup> An incident is defined as any event or circumstance that could have, or did, lead to harm, loss or damage and includes loss of data, confidentiality breaches, harm to researchers or staff or damage to property.

You are required to provide all participating sites with all relevant study information to enable them to fulfil their role within the research. This will include as a minimum:

- (a) Final approved protocol
- (b) Copies of REC favourable opinion, NHS Permission letter covering that site, any other approvals necessary (e.g. MHRA)
- (c) Participant information sheets, consent forms, invitation letters, posters/adverts and any other documentation given to the participant

It is your responsibility to update the information held at each site with any amendments made to this documentation and all approval letters applicable to those amendments and to ensure that all essential documents held at each site are maintained, stored and archived as appropriate.

#### Transfer of data

- Transfer of patient identifiable or confidential data must be in accordance with Trust policies.

#### Scope of permission

- Please note that the above permission applies only to research activity on NHS staff or premises or involving NHS Patients and/or their tissues, data or samples. Separate agreements and permissions will be required for research involving private patients or those under the care of social services.

#### Documents Reviewed

The following documents were reviewed:

#### Letter of Favourable Opinion from NRES Committee South West – Frenchay, dated 15<sup>th</sup> May 2013

- Evidence of Insurance/Indemnity, 15<sup>th</sup> May 2012
- Investigator CV – Dr Peter Langdon
- Investigator CV – Susan Sadek
- Investigator CV – Matthew Daniel
- Dot Probe Images, Version 2, 30<sup>th</sup> April 2013\*
- Participant Consent Form, Version 2, 30<sup>th</sup> April 2013
- Information Sheet for Professionals, Version 2, 30<sup>th</sup> April 2013\*
- Participant Information Sheet, Version 2, 30<sup>th</sup> April 2013
- Protocol, Version 3, 2<sup>nd</sup> May 2013
- Social Reflection Questionnaire
- Response to Request for Further Information, 30<sup>th</sup> April 2013

#### Other Documents Reviewed

- Fully Signed NHS R&D Form, Lock Code 117923/425321/14/16
- Signed SSI Form, Lock Code 117923/452092/6/88/179430/272221

\* These documents are incorrectly labelled on the REC letter of favourable opinion.

## Providing Partnership Services in Bedfordshire, Essex and Luton



Date: 14 June 2013

Dr Peter Langdon  
Department of Psychological Sciences  
Norwich Medical School  
University of East Anglia,  
Norwich Research Park, Norwich  
NR4 7TJ

P.Langdon@uea.ac.uk

### Directorate of Clinical Governance & Quality

Pride House  
Christy Close  
Southfields Industrial Estate  
Laindon  
Essex  
SS15 6EA

Tel: 01268 407725

Fax: 01268 407810

sarah.thurlow@SEPT.nhs.uk

Chair: Lorraine Cabel

Chief Executive: Dr Patrick Geoghegan OBE

Dear Dr Langdon

**Research Study – Developing measures and exploring relationships between empathy, reasoning and problem solving with men with intellectual disabilities who have forensic mental health problems.**

NIHR ID number - 14267

IRAS reference - 117923

NRES reference - 13/SW/0084

I am pleased to confirm that your research study was reviewed by the Research Governance Group (RGG) at their meeting on 30<sup>th</sup> May 2013 and your study was given final approval on 14<sup>th</sup> June 2013. The Trust has to meet rigorous standards set by the Department of Health for research governance so your research must be carried out subject to the following conditions: -

- A favourable ethical opinion is given by a Research Ethics Committee.
- The research must be carried out in strict accordance with the protocol submitted and any changes to that protocol must be approved by the RGG and receive a favourable ethics opinion from a Research Ethics Committee before the research is undertaken or continues.
- Please see Appendix 1 for the list of documents that have been approved. If you make any changes to the approved documents relating to the study please inform the RGG you make any changes to the approved documents relating to the study (appendix 1) please inform the RGG.
- A financial or any other agreement relating to your research that is binding upon this Trust must be notified to me and thereafter approved and signed by the Mr Andy Brogan, Director of Clinical Governance and Quality on behalf of the Trust.
- You must report any adverse events/serious untoward incidents relating to this research to me as soon as practicable. I can be contacted by telephone on 01268 407725 or 07940 425856. In my absence, incidents should be reported to Ms Sarah Browne, the Associate Director of Clinical Governance & Quality on 01582 708986 or 07500 097816. In addition, you must complete one of the Trust's adverse incident forms and follow the requirements as set out in the Trust's adverse incident reporting policy. A copy of this form must be submitted to me as soon as possible. A copy of the Trust's adverse incident reporting policy can be located on the Trust's intranet or alternatively, please contact me and I will be happy to supply you with a copy.

[www.SEPT.nhs.uk](http://www.SEPT.nhs.uk)



South Essex Partnership University NHS  
NHS Foundation Trust



## Providing Partnership Services in Bedfordshire, Essex and Luton



- In cases where the research will take place over a period of more than 12 months, you are required to send to me a copy of the report on your research which will be required by the Research Ethics Committee. You will be notified when this report is due by the Research Ethics Committee that issued the favourable opinion to proceed with the study.
- Any research terminated prematurely must be notified to me immediately.
- The full final report from the study should be sent to me within 3 months of final report so that the RGG can consider it. You are also required to supply a summary or abstract of the study that would be suitable for dissemination.
- As a result of the Research Governance Framework for Health and Social Care, the Trust now has an obligation to monitor research being undertaken within the Trust. You might be required to complete a short questionnaire although this will be no more than once a year. The questionnaire will be completed for you with as much information already known in order to reduce the amount of your time that you have to spend on this. In addition, the Trust is required to randomly select 10% of research studies to be audited. If your study is selected as part of this audit process, you will be notified to ensure your availability.

The RGG, on behalf of the Trust, will revoke or suspend its approval to any research that does not comply with these conditions, is in breach of Research Ethics Committee approval or where there is any misconduct or fraud.

I would like to reassure you that these conditions are applied simply to ensure that the Trust meets its obligations under the Research Governance Framework for Health and Social Care. Please contact me if I can help with any issues that might arise for you as a result.

I understand that the only involvement from SEPT staff initially is through them identifying potential participants and gaining verbal consent from them to be contacted by members of the University of East Anglia research team. Once a SEPT identified participant has been successfully recruited and where you are required to meet them on site, access medical notes or liaise with/obtain support from a member of their usual clinical care team an appropriate Letter of Access (LoA) would need to be issued by me prior to attending on site and commencing any study related procedures, therefore please contact me with details of the staff members research passports in order that I can issue the appropriate LoAs.

I wish you every success with your research and look forward to receiving a copy of the study report in due course.

Kind regards

Yours sincerely

A handwritten signature in black ink, appearing to read 'Sarah Thurlow', is positioned above the printed name.

**Sarah Thurlow**  
Head of Research

Cc: Susan Sadek PhD student (UEA)  
Cc: Matthew Daniel PhD student (UEA)  
Cc: Yvonne Kirkham Sponsor Contact  
Cc: Clare Symms Lead NHS R&D Contact

[s.sadek@uea.ac.uk](mailto:s.sadek@uea.ac.uk)  
[matthew.daniel@uea.ac.uk](mailto:matthew.daniel@uea.ac.uk)  
[y.kirkham@uea.ac.uk](mailto:y.kirkham@uea.ac.uk)  
[Clare.Symms@norfolk.nhs.uk](mailto:Clare.Symms@norfolk.nhs.uk)

5 August 2013

*Understanding children, young people and families*

R&D Ref: M00551

Dr Isabel Clare  
Cambridge Intellectual & Developmental  
Disabilities Research Group  
Department of Psychiatry  
University of Cambridge, Douglas House  
18b Trumpington Road  
Cambridge CB2 8AH

**Research and Development Department**

Joint Research Office  
Box 277  
Addenbrooke's Hospital  
Hills Road  
Cambridge  
CB2 0QQ

Direct Dial: 01223 596472 ext 6472  
E-mail: [beth.muldrew@cptf.nhs.uk](mailto:beth.muldrew@cptf.nhs.uk)  
[www.cptf.nhs.uk](http://www.cptf.nhs.uk)

Dear Dr Clare

**Re: 13/SW/0084 – Developing measures of empathy and reasoning**

In accordance with the Department of Health's Research Governance Framework for Health and Social Care, all research projects taking place within the Trust must receive a favourable opinion from an ethics committee and approval from the Department of Research and Development (R&D) prior to commencement.

R&D have reviewed the documentation submitted for this project, and has undertaken a **site specific assessment** based on the information provided in the SSI form, and I am pleased to inform you that we have no objection to the research proceeding within CPFT.

**Sponsor: University of East Anglia**

**Funder: NIHR Post-Doctoral Fellowship Programme**

**End date: 01/12/2015**

**Protocol: Version 3.0 dated 2 May 2013**

**Conditions of Trust Approval:**

- The project must follow the agreed protocol and be conducted in accordance with all Trust Policies and Procedures especially those relating to research and data management. Any mobile devices used must also comply with Trust policies and procedures for encryption.
- You and your research team must ensure that you understand and comply with the requirements of the NHS Confidentiality Code of Practice and the Data Protection Act 1998 and are aware of your responsibilities in relation to the Human Tissue Act 2004, Good Clinical Practice, the NHS Research Governance Framework for Health and Social Care, Second Edition April 2005 and any further legislation released during the time of this study.



HQ Elizabeth House, Fulbourn Hospital, Cambridge CB21 5FF  
T: 01223 725789 F: 01480 398501 [www.cptf.nhs.uk](http://www.cptf.nhs.uk)

A member of Cambridge University Health Partners

- Members of the research team must have appropriate substantive or honorary contracts with the Trust prior to the study commencing. Any additional researchers who join the study at a later stage must also hold a suitable contract.
- You and your research team must provide to R&D, as soon as available, the date of first patient first visit.

**If the project is a clinical trial under the European Union Clinical Trials Directive the following must also be complied with:**

- the EU Directive on Clinical Trials (Directive 2001/20/EC) and UK's implementation of the Directive: The Medicines for Human Use (Clinical Trials ) Regulations 2004;
- the EU Directive on Principles and Guidelines for Good Clinical Practice (EU Commission Directive 2005/28/EC); and UK's implementation of the Directive: The Medicines for Human Use (Clinical Trials) Amendment Regulations 2006;

#### **Amendments**

Please ensure that you submit a copy of any amendments made to this study to the R&D Department.

#### **Annual Report**


It is obligatory that an annual report is submitted by the Chief Investigator to the research ethics committee, and we ask that a copy is sent to the R&D Department. The yearly period commences from the date of receiving a favourable opinion from the ethics committee.

Please refer to our website [www.cpftr.nhs.uk](http://www.cpftr.nhs.uk) for all information relating to R&D including honorary contract forms, policies and procedures and data protection.

Should you require any further information please do not hesitate to contact us.

Yours sincerely



 Stephen Kelleher  
Senior R&D Manager

Cc Sue Steel, Contracts Manager, University of East Anglia





Dr Peter Langdon  
University of East Anglia  
Department of Psychological Sciences  
Norwich Medical School, Norwich Research Park  
Norwich  
NR4 7TJ

R&D Department  
Department of Psychiatry  
QEII Hospital  
Howlands  
Welwyn Garden City  
AL7 4HQ

Tel. 01707 389058  
Tel. 01707 385089  
Fax. 01707 385189  
e-mail [t.gale@herts.ac.uk](mailto:t.gale@herts.ac.uk)

29<sup>th</sup> May 2013

Dear Dr Langdon,

**Research Study: Developing measures and exploring relationships between empathy, reasoning and problem solving with men with intellectual disabilities who have forensic mental health problems.**

**REC reference: 13/SW/0084**

I have received the documentation in support of the above project. Following a review by The R&D Department, I am pleased to tell you that the study now has R&D approval for our Trust on behalf of Hertfordshire Partnership University NHS Foundation Trust.


Approval is given on the understanding that you will notify the R&D Office of any further amendments to the study design, that you will carry out the study as specified in the final version of the protocol, and that you will comply fully with the HPFT R&D Policy (copy sent by e-mail).

With kind regards

**Dr Tim M Gale**  
Manager, Research and Development Department  
Visiting Professor, Dept Psychology, UoH



Research Support Service  
 The most successful health  
 organisations in the world

Leicestershire Partnership   
 NHS Trust

A University Teaching Trust

Research & Development Office  
 Lakeside House  
 4 Smith Way  
 Grove Park  
 Enderby  
 Leicester  
 LE19 4SS

Direct dial: 0116 296 7341  
 Email: [david.clarke@leicspart.nhs.uk](mailto:david.clarke@leicspart.nhs.uk)

Tel: 0116 296 7500  
 Fax: 0116 296 7389  
 Web: [www.leicspart.nhs.uk](http://www.leicspart.nhs.uk)

DC/MO/FOM/ICG35/ST/MHRN (CSP117923)

Mr Matthew Daniel  
 Cambridgeshire and Peterborough Foundation NHS Trust  
 Norwich Medical School,  
 University of East Anglia  
 Norwich Research Park,  
 Norwich  
 NR4 7TJ

17<sup>th</sup> June 2013

Dear Matthew

**RE: CSP 117923 Developing measures and exploring relationships between empathy, reasoning and problem solving with men with intellectual disabilities who have forensic mental health problems.**

Thank you for applying for NHS Permission (also known as Research Governance Approval) for the above-named study. I am pleased to inform you that the formal review of the project is now complete. The outcome of this review is given below:

Full Approval  Approval in Principle  Approval refused

Your responsibilities are set out in the attached agreement, which must be signed and returned to the Research Office. You should keep a copy for your records. All research must be managed in accordance with the requirements of the Dept. of Health Research Governance Framework (RGF), and to ICH-GCP standards. In order to ensure compliance with these standards, the Trust may randomly select your study for audit against these standards at any time, and may employ an external agency for this purpose.

This approval is contingent upon the validity of the following information:

**Study Summary**

Chief Investigator (Supervisor):	Dr Peter Langdon	HC/LoA <sup>1</sup>	Yes/No
Principal Investigator:	Mr Matthew Daniel	HC/LoA	Yes/No
Other Investigator:	Ms Sussan Sadek	HC/LoA	Yes/No
Indemnity Provider:	University of East Anglia & NHS Indemnity	Start Date	28/06/2013
NHS Portfolio:	YES (MHRN)	End Date	28/06/2015
Student Project:	YES	Target	30
		Recruitment	

**Approved Documentation**

Document	Version Number	Date	REC Date
REC favourable opinion letter	N/A	15.05.13	15.05.13
Participant consent form	2	09.04.13	15.05.13

<sup>1</sup> Monetary Contract or Letter of Access Required

Chairman: Professor David Clark CBE Acting Chief Executive: Sue Noyes



Participant Information sheet: professionals	1	18.10.12	15.05.13
Participant Information sheet	2	30.04.13	15.05.13
Protocol	3	02.05.13	15.05.13
Questionnaire: Validated: Social Reflection Questionnaire	N/A	N/A	15.05.13
Data collection pack time 1	?	30.04.13	15.05.13
Data collection pack time 2	2	30.04.13	15.05.13
Dot probe images	1	17.05.13	15.05.13

Please note that all research with an NHS element is subject to the Research Governance Framework for Health and Social Care 2005. If you are unfamiliar with the standards contained in this document, or the LPT policies that reinforce them, you can obtain advice from the R&D Office, or go to <http://www.dh.gov.uk/PolicyAndGuidance/ResearchAndDevelopment/ResearchAndDevelopmentAZ/ResearchGovernance/fs/en>.

You must stay in touch with the R&D Office during the course of the research project, particularly if/ when:

- There is a change of Principal Investigator;
- The project finishes (please complete a summary report form)
- Amendments are made, whether minor or substantial;
- Serious Adverse Events have occurred (must be reported within 24 hours of becoming aware of the event).

This is necessary to ensure that your indemnity cover is valid. Should any untoward events occur it is essential that you contact the R&D Office immediately. If patients or staff are involved in an incident, you should also contact the Clinical Risk Manager.

The duration of this approval extends only to the date specified in your MRES submission, and you should inform the Trust if this is to be extended. Action may be taken to suspend Trust approval if not conducted to these standards, and the study must commence within two years of the REC approval date, and within six months of R&D approval.

I hope the project goes well, and if you need any help or assistance during its course, please do not hesitate to contact me.

Kind regards



Dr. Dave Clarke  
[Operational Lead Research & Development]

## Appendix 17. Results: Kolmogorov-Smirnov Tests

	IDO			IDNO		
	Statistic	df	Sig	Statistic	df	Sig
Age	.24	34	*.00	.15	32	.08
School leaving age	.31	32	*.00	.21	30	*.00
FSIQ <sup>a</sup>	.11	33	.20	.15	32	.06
GAS <sup>a</sup>	.10	34	.20	.09	32	.20
GDS <sup>a</sup>	.09	33	.20	.11	32	.20
EQ <sup>a</sup>	.12	33	.20	.14	32	.10
Mean Dot-Probe Scores (ms)						
All Trials	.24	33	*.00	.17	32	.02
Negative Congruent Trials	.25	33	*.00	.19	32	*.01
Positive Congruent Trials	.29	33	*.00	.16	32	*.05
Negative Incongruent Trials	.25	33	*.00	.13	32	.20
Positive Incongruent Trials	.23	33	*.00	.18	32	*.01
Neutral Trials	.25	33	*.00	.16	32	*.03
Negative-Affective Bias Index	.12	33	.20	.21	32	*.00
Positive-Affective Bias Index	.19	33	*.00	.21	32	*.00
Global-Affective Bias Index	.18	33	*.01	.22	32	*.00
Errors	.26	33	*.00	.32	32	*.00

Note: \* Statistically significant (2 tailed). <sup>a</sup> Normally distributed

## Appendix 18. Results: Homogeneity of the Regression Slopes

	Age (Sig)	FSIQ (Sig)	GAS (Sig)	GDS (Sig)
Negative-Affective Bias Index	.77	.20	.71	.74
Positive-Affective Bias Index	.85	.73	.71	.74
Global-Affective Bias Index	.40	.78	.68	.49

*Note.* FSIQ = Full Scale IQ, EQ = Empathy Quotient, GDS = Glasgow Depression Scale, GAS = Glasgow Anxiety Scale.

Analyses conducted separately.

**Appendix 19. Results: Correlation Analyses of Study Variables with Attentional Bias Indices**

	Negative-Affective Bias Index	Positive-Affective Bias Index	Global-Affective Bias Index
Age	-.19 <sup>a</sup> .13 <sup>b</sup>	-.07 <sup>a</sup> .62 <sup>b</sup>	-.15 <sup>a</sup> .24 <sup>b</sup>
FSIQ	-.41-.01 <sup>c</sup> -.02 <sup>a</sup> .86 <sup>b</sup>	-.27-.16 <sup>c</sup> -.15 <sup>a</sup> .25 <sup>b</sup>	-.37-.06 <sup>c</sup> -.08 <sup>a</sup> .51 <sup>b</sup>
EQ	-.25-.25 <sup>c</sup> -.01 <sup>a</sup> .95 <sup>b</sup>	-.37-.17 <sup>c</sup> .12 <sup>a</sup> .37 <sup>b</sup>	-.32-.22 <sup>c</sup> .05 <sup>a</sup> .70 <sup>b*</sup>
GAS	-.31-.23 <sup>c</sup> -.04 <sup>a</sup> .76 <sup>b</sup>	-.11-.30 <sup>c</sup> -.14 <sup>a</sup> .28 <sup>b</sup>	-.21-.27 <sup>c</sup> -.09 <sup>a</sup> .48 <sup>b</sup>
GDS	-.26-.16 <sup>c</sup> .20 <sup>a</sup> .13 <sup>b</sup> .01-.36 <sup>c</sup>	-.33-.09 <sup>c</sup> .08 <sup>a</sup> .53 <sup>b</sup> -.09-.278 <sup>c</sup>	-.30-.12 <sup>c</sup> .16 <sup>a</sup> .21 <sup>b</sup> -.02-.35 <sup>c</sup>

*Note.* FSIQ = Full Scale IQ, EQ = Empathy Quotient, GDS = Glasgow Depression Scale, GAS = Glasgow Anxiety Scale. <sup>a</sup> Pearson Correlation. <sup>b</sup> Statistically significant (2 tailed). <sup>c</sup> BCa 95% Confidence Interval. \*Sig (2 tailed).