

**Social Cognition, Attachment and
Emotional Regulation in Young Adults
Leaving Care**

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Thesis submitted in partial fulfilment of the requirement for the degree of Doctor of
Clinical Psychology at Cardiff University and the South Wales Doctoral Programme
in Clinical Psychology

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This work has not been submitted in substance for any other degree or award at this or any other university or place of learning, nor is being submitted concurrently in candidature for any degree or other award

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'My book' – for Finn and Noah

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Abstract

Deficits in social cognition are increasingly recognised as a core characteristic of many psychological problems, especially those characterised by emotional dysregulation. Compared to the general population, care-leavers are at a higher risk of experiencing mental health problems. However, there are no studies of social cognition in this population. This study sought to address this gap in the literature and investigate the relationship between adult romantic attachment style, social cognition and emotional regulation. Thirty care-leavers were recruited through social care teams and third sector organisations. A comparison group of 35 age and gender matched non-care leavers were recruited from a further education college. All participants completed the Experiences in Close Relationships scale, the Difficulties with Emotional Regulation Scale and the ‘Movie for Assessment of Social Cognition’ (MASC).

Care-leavers were found to have significantly greater impairments in social cognition and emotional regulation. Specifically, care-leavers showed an increased tendency to over-interpret the mental states of others. The relationship between care-leaver status and emotional regulation was partially mediated by social cognition. This suggests that young people leaving care are more likely to over-interpret social signs in relational contexts, which gives rise to emotions that are difficult to control. In the combined sample, adult romantic attachment anxiety, but not avoidance, was associated with greater difficulties with emotional regulation and over-interpretative mental state inferences on the MASC. Social cognition did not mediate the relationship between attachment anxiety and emotional regulation scores, indicating that impaired social cognition and higher attachment anxiety are independent risk factors for emotional dysregulation in this population. The findings suggest that social cognitive style might be an appropriate target for therapeutic intervention in young people leaving care. Theoretical implications of the study findings are discussed and areas for future research are suggested.

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Chapter One

Introduction

1.1 Focus of the thesis

An increasing number of young people are being taken into local authority care and consequently the number of young people ‘aging out’ of care is rising (Department for Education, 2013b; Welsh Government, 2013). Care-leavers are arguably one of the most vulnerable and disadvantaged groups in society. Compared to their peers they are at a greater risk of experiencing attachment problems and difficulties in regulating their emotions and behaviour (Feeney *et al.*, 2007; Tarren-Sweeney, 2008), as well as an array of adverse social, educational, and occupational outcomes (Department of Health, 2009). However, few studies have investigated specific risk factors for psychological difficulties in this population, and the little research that has been reported has generally not been embedded in a theoretical model (Stein, 2006a).

The mentalisation-based theoretical model for the development of psychopathology (Fonagy, 1989; Fonagy, 1991) offers a useful framework for thinking about the psychological needs of young people leaving care. According to this model, a prerequisite for optimal psychological functioning is the capacity to infer the mental states of both ourselves and others. The latter reflects social cognition. Social cognitive difficulties are more common in those who experience disruptions in early attachment and trauma, and are associated with a wide range of psychological and emotional difficulties (Penn *et al.*, 2008; Roepke *et al.*, 2013; Samame, 2013). However, there are no studies investigating social cognition in care-leavers. The primary aim of this thesis is to address this gap in the literature by comparing social cognitive functioning, assessed using an ecologically valid measure of social cognition, in care-leavers and a demographically matched sample of young people raised by their birth parents. Building on this, this study aims to test whether care-leavers were more likely to experience difficulties with emotional regulation than

their peers, and whether social cognition mediates the relationship between being in local authority care and difficulties with emotional regulation.

It is thought that many behavioural and emotional difficulties experienced by young people who have spent time in care are underpinned by attachment problems (Andrew *et al.*, 2013; Hughes, 2004). The mentalisation-based theoretical model for the development of psychopathology proposes that capacity to understand the thoughts, feelings and desires of others develops within the context of attachment relationships (Fonagy & Luyten, 2009). In turn, impairments in interpreting the mental states of others are thought to lead to difficulties with emotional regulation (Fonagy, 1989; Fonagy, 1991). For example, overly interpretative and negatively biased inferences in social contexts can leave individuals at risk of being overwhelmed by others' mental states (Fonagy & Luyten, 2009). This study will seek to investigate these components of the mentalisation-based model using a social cognitive paradigm; principally by testing the relationship between adult attachment style, social cognition and emotional regulation. This study will have broad theoretical implications for understanding psychological difficulties underpinned by impairments in emotional dysregulation, as well as clinical implications relevant to the provision of services to young people leaving care.

1.2 Definitions of key terminology

1.2.1 Care-leaver

In this thesis the term 'care-leavers' is used to refer to young people aged between 16 and 21 (or 24 if still in education) who meet the Children Leaving Care Act (2000) criteria for being 'eligible', 'relevant' or 'former relevant' children. As such they must have spent at least 13 weeks in care since the age of 14 and have been looked after for some time while aged 16-17. Under the Children Act 1989 in England, the term 'looked after children' refers to children who are provided with substitute care, either on a voluntary basis to assist parents or as the result of a court order.

1.2.2 Attachment

The term 'attachment' in this thesis is used to refer to a deep and enduring bond that connects one person with another across time and space (Ainsworth *et al.*, 1978;

Bowlby, 1969). ‘Attachment behaviour’ is used to describe any form of physical and psychological activity that seeks to maintain close physical or psychological proximity with an attachment figure or to increase feelings of security when upset or threatened (e.g. proximity seeking and separation distress in children). ‘Attachment style’ is used to refer to long-standing patterns in attachment behaviour, thought to develop as a result of mental representations, or internal working models, of the self and significant others based on interpersonal experiences (Fraley & Shaver, 2000). Specifically, this study uses a measure of adult romantic attachment style. As people seem to make attachment representations that are relationship-specific, differentiation will be made between types of attachment relationship where appropriate (e.g. infant-caregiver, romantic attachment, friendship attachment).

1.2.3 Mentalisation

In this thesis the term ‘mentalisation’ is used in the context described by Peter Fonagy, specifically “the capacity to conceive of conscious and unconscious mental states in oneself and others as meaningful on the basis of intentional mental states such as personal desires, needs, feelings, beliefs, and reasons” (Fonagy, 1991, p. 641). Mentalisation refers collectively to the competencies required by humans to infer and think about the mental states of self and others that underlie overt behaviour.

1.2.4 Social Cognition

This thesis is concerned with an individual facet of ‘mentalisation’: social cognition. In the literature the term is used interchangeably with other descriptors such as ‘mentalising’, ‘theory of mind’, ‘mind reading’, ‘reflective functioning’, ‘affect recognition’ and ‘emotional intelligence’. It is recognised that there are some differences between these terms. To avoid confusion the term ‘social cognition’ will be used in this thesis to refer to the broad set of mental operations that underlie social interactions, including perceiving, interpreting and generating responses to the intentions, emotions and behaviours of others (Green *et al.*, 2008). These activities are multi-faceted and include encoding, storage, retrieval and processing of social information, emotional recognition and empathy. Where appropriate, care will be taken to explicitly differentiate between the global construct of social cognition and

individual facets of social information processing (e.g. encoding, storage, retrieval and processing of social information, emotional recognition etc.).

1.3 Why study care-leavers?

1.3.1 Reasons why children are taken into care

Children and young people are taken into care when it is deemed that their parents are not able to provide a satisfactory level of care (The Children Act, 1989, 2004). The majority of looked after children – around 62.3 per cent in 2013 – are brought into care because they have experienced abuse or neglect. Other reasons why children are brought into care include acute family stress (9.2%) or family dysfunction (14.9%); absent parenting (4.6%); as well as parental (3.7%) or child disability or illness (3.3%) (Department for Education, 2013b; Welsh Government, 2013). The most frequent substitute care option is foster care (75.0%) or adoption (4.9%). However, significant proportions of young people are placed in residential settings (10.7%) or secure units (0.6%). Five per cent of children are placed with their own parents or other persons with parental responsibility. Whilst many children who enter the care system stay for brief periods only, a considerable number of children spend significant portions of their childhood in care (Department for Education, 2013b).

1.3.2 Number of children in care or leaving care in England and Wales

On 31st of March 2013, there were 5,743 children and young people in the care of social services in Wales (Welsh Government, 2013) and 68,110 in England (Department for Education, 2013b). In Wales, this represents a rate of 91 per 10,000 population aged under 18, which is higher than 60 per 10,000 population in England. This is perhaps unsurprising given the association between social deprivation and children entering care (Bywaters, 2013) and the relative poverty of some parts of Wales compared to the rest of the UK (Department for Work & Pensions, 2013). The number of children entering care has been rising steadily for several years and is now higher than at any point since 1985 (Department for Education, 2013b). In the last five years alone, the number of looked after children in England and Wales has risen by 12% and 24%, respectively (Department for Education, 2013b; Welsh Government, 2013). Correspondingly, there has been a steady rise in young people

leaving, or ‘aging out’ of care. In the year to 31 March 2013, 655 young people aged 16 or over, left or ‘aged out of’ care in Wales, a rise of 34% compared with five years ago. With the increasing number of young people entering the care system, this trend is likely to continue for the foreseeable future.

1.3.3 Difficulties experienced by young people in or leaving care

Young people leaving the care of the local authority are arguably one of the most vulnerable and disadvantaged groups in society (Tarren-Sweeney, 2008). It is well recognised that young people growing up in state care are at a greater risk of experiencing educational, social and psychological difficulties (Cousins *et al.*, 2010; Department for Children, 2009; Ford *et al.*, 2007; Mcauley & Davis, 2009; Tarren-Sweeney, 2008)

1.3.3.1 Education

Looked after children and care-leavers perform less well academically, at all stages of formal education, than their peers. In England, between 69-71% of looked after children attained the expected levels of performance in reading, writing and mathematics at Key Stage 1 (typically age 5-7) in 2013. This compares to 85-91% of non-looked after children (Department for Education, 2013c, 2013d). The gap in attainment between looked after and non-looked after children grows as children pass through school. For example, in England only 36.6% of looked after children achieved five GCSEs grade A*-C, compared to 80.3% of non-looked after children. Young people who have spent time in care also endure disadvantages well beyond their care years. For example, 34 per cent of young people in England who were looked after at the age of 16 were not in education, employment or training by the age of 19 (Department for Education, 2013d) – twice the proportion recorded in the general population (Department for Education, 2013c). In contrast, care-leavers are much less likely to continue to higher education - it is estimated that only 6% of care-leavers go onto higher education, compared with 39% in the general school population (Jackson & Ajayi, 2007). These low levels of academic achievement put care-leavers at further risk of experiencing deprivation and social exclusion in later life.

1.3.3.2 *Crime*

In the year to 31 March 2013, 6.2% of looked after children aged 10-17 years received a reprimand, final warning or conviction, compared to 1.5% of all children (Department for Education, 2013d). Amongst looked after children, offending is higher among older children and more frequent amongst boys, mirroring national trends for all children. Those who spend time in residential care are also more likely to offend than those in foster care, as are those who come into care due to family dysfunction/acute stress and those who experience more than three placements (Department for Education, 2013d). Strikingly, it is estimated that between 24% of those in prisons (Williams *et al.*, 2012) and 49 % of those in young offenders institutions (Blades *et al.*, 2011) have spent time in care - even though less than 1% of all children in England were looked after at 31 March 2013 (Department for Education, 2013b). Longitudinal, population-based studies have found that being placed into public care is a significant risk factor for having a criminal conviction in adulthood – especially among those admitted to care after the age of 10, who are over six times more likely to have a criminal conviction at age 30 compared with those raised by their birth parents (Dregan *et al.*, 2011). The reasons why looked after children are more likely to offend are complex and multi-factorial (Blades *et al.*, 2011).

1.3.3.3 *Substance abuse*

Young people placed into the care of local authorities are more likely to experience substance misuse problems. In 2013 official figures state that 3.5% of all looked after children in England were identified as having a substance misuse problem (Department for Education, 2013d). The proportion of young people in care identified as having a substance misuse problem rises exponentially with age, from 0.3% among 10-12 year olds to 10.5% among 16-17 year olds. Furthermore, the proportion of individuals identified as having a substance misuse problem is thought to increase in the first 12-15 months of young people being out of the care system (Dixon, 2008). A survey of 200 young people in the process of leaving care found that over half had used cannabis in the last month, and one in ten reported using heroin or crack cocaine (Ward *et al.*, 2003) – these rates are substantially higher than estimates in the general population (Home Office, 2013).

1.3.3.4 Psychological wellbeing

It is well recognised that children who spend time in care are more likely to experience psychological difficulties than non-looked after children (Department for Children, 2009). In the largest study, Ford *et al.* (2007) combined four nationally representative surveys of mental health of children and adolescents, three of which focused on looked after children (Meltzer *et al.*, 2000, 2003a, 2003b, 2004). They reported that 45% of looked after children were assessed as having a ‘mental health disorder’, rising to 71% in those placed in residential care (Ford *et al.*, 2007). This compared to around 10% of the general population (Meltzer *et al.*, 2000). Whilst conduct disorder was the most frequent ‘disorder’ for looked after children, the trend was for much higher prevalence rates for all ‘disorders’ amongst looked after children, compared with children from the general population. For example, depression and anxiety disorders, such as post-traumatic stress disorder, separation anxiety, and generalised anxiety disorder, were found to be more common in looked after children when compared to children raised in ‘private households’. Notably, two-thirds of looked after children who were not assessed as having a ‘mental disorder’ were viewed by their carers to have emotional or behavioural problems. Fewer than one in ten children looked after by local authorities demonstrated ‘good psychological adjustment’, compared with around one in two children living in private households. Similar findings have been reported in the Australia, the United States and other European countries (Burns *et al.*, 2004; Dimigen *et al.*, 1999; Dumaret & Ruffin, 1999; Green *et al.*, 2005; Mccann *et al.*, 1996; Pecora *et al.*, 2009; Tarren-Sweeney, 2008).

Longitudinal studies provide evidence that those who have spent time in care continue to experience disproportionately high levels of psychological difficulties compared to those raised by their birth parents – both during the transition from care and well into adulthood. Whilst most young people experience a gradual transition to adulthood (Furstenberg *et al.*, 2005), young people leaving care often face a compressed and accelerated journey into independence (Stein, 2008). Qualitative research suggests that some care-leavers feel unprepared for the demands of independent living at the age they leave care (Holland *et al.*, 2010). There is a paucity of research aiming to quantify the impact of this difficult period on young people. In a small scale study of 106 young people leaving care in England, Dixon *et al.* (2008)

reported that the prevalence of young people self-reporting mental health problems doubled in the 12-15 months they spent living out of care – with over 40% reporting increases in GHQ-12 scores (Dixon, 2008). A similar study in Scotland found a four-fold increase in young people reporting mental health problems in the eleven months after leaving care (Dixon & Stein, 2005). These findings are consistent with studies in the US and Europe (Bohman & Sigvardsson, 1980; Buehler *et al.*, 2000; Courtney *et al.*, 2005; Courtney *et al.*, 2007; Dumaret *et al.*, 1997; Lawrence *et al.*, 2006; Pecora *et al.*, 2009), suggesting that the transition from care itself can adversely affect mental health and wellbeing.

In the context of research evidence that shows the increased vulnerability to mental health difficulties amongst looked after children and the difficulties faced by young people ‘aging out of care’ (as well as the known continuity of adolescent psychological difficulties into adulthood; Collishaw *et al.*, 2004), longitudinal studies have sought to test the relationship between spending time in local authority care and later life psychological difficulties. Several UK studies have been based on the 1958 National Child Development Study, which have reported mixed findings (Buchanan *et al.*, 2000; Cheung & Buchanan, 1997; Power *et al.*, 2002). Specifically, experience of being placed in the care system was associated with psychological distress at age 33 in men, but not in women. However, these studies had methodological flaws – perhaps most notably the reliance on retrospective reports of care experiences and high sample attrition (particularly in disadvantaged groups, such as those who have spent time in care) – and reflect public care influences during a certain era (the 1960’s). A more recent study, based on the 1970 British Birth Cohort, found that after adjusting for confounding variables, exposure to both foster and residential care, longer placements and multiple placements were associated with more extensive adult emotional and behavioural difficulties at age 30 (Dregan *et al.*, 2011; Viner & Taylor, 2005). This finding is consistent with studies in the US (Courtney *et al.*, 2011; Pecora *et al.*, 2009) and non-population based studies (Bruskas & Tessin, 2013), suggesting that children from public care continue to be at a disadvantage to their peers at least into mid-adulthood.

Despite the recent advances in estimating the scale and severity of mental health problems among looked after children, less is known about the *nature* of the mental

health needs in this population. In a review of the literature, Tarren-Sweeney (2008) highlighted the complex emotional difficulties experienced by looked after children, which are often characterised by attachment difficulties, relationship insecurity, sexual behaviour, trauma-related anxiety, conduct problems and defiance, and inattention/ hyperactivity, as well as high rates of self-harm and suicidal behaviour. Many of these problems are indicative of difficulties with emotional regulation.

Methodological complexities make it difficult to draw firm conclusions about the impact of public care experiences on psychological wellbeing in adulthood (Dregan *et al.*, 2011; Stein & Dumaret, 2011). Several studies have focused on discrete populations (e.g. clinic-based samples), have lacked adequate comparison groups and utilised different definitions of psychological well being and ‘spending time in care’. Even longitudinal studies, which are best placed to address complex questions in this population, have suffered with high rates of attrition. Furthermore, the findings are not embedded in a clear theoretical framework (Stein, 2006a) and it would be short sighted to imply that public care is the primary *causal* predictor of psychological distress. Despite these shortcomings, the wealth of evidence suggests that young people who have spent time in care are a high-risk group for experiencing psychological difficulties – especially those characterised by attachment difficulties and emotional dysregulation.

1.3.4 Care leaver policy context

Over the past 30 years a greater awareness and understanding of the needs of care leavers has led to a progressive strengthening of policies aiming to improve outcomes for looked after children. The legal framework for looked after children is the Children’s Act 1989, subsequently amended by the Children (Leaving Care) Act 2000, which puts a duty on local authorities to advise, assist and befriend young people leaving care with a view to promoting their welfare after they have ceased to be ‘looked after’. Following the publication of the ‘Care Matters: Time for Change’ (Department for Education and Skills, 2007), the Children and Young Persons Act 2008 and Care-leavers (England) Regulations 2010 placed further duties on local authorities to assist looked after children to make their transition into adulthood.

These Acts generated a range of initiatives across government departments aiming, amongst other things, to: widen access to further education, work experience and apprenticeships; provide financial support to young people seeking to continue in education or training; provide wage initiatives for employers of care-leavers; reduce rates of offending and victimisation of young people who have spent time in care; offer tailored accommodation options and support to set up home; and prevent homelessness. Local authorities have a statutory duty to adequately assess, prepare and plan for young people leaving care, ensuring that their voice is heard, as well as ensuring that those leaving care have access to a personal advisor and adequate support up to the age of 21 (or 25 if they are in education).

Guidance on promoting the physical and mental health needs of young people in and leaving care has been provided by the Department of Children (2009) and jointly by the National Institute for Health and Clinical Excellence & Social Care Institute for Excellence (2010), who have since developed a set of quality standards for the Health and wellbeing of looked-after children and young people (National Institute for Health and Clinical Excellence, 2013). Notably, these documents recognise the specific and complex emotional needs of young people in care and promote timely access to specialist and dedicated mental health services. In the UK, local authority 'Leaving care teams' are tasked with implementing the many duties set out in these policies. Outcome studies evaluating specialist leaving care services have found that they can make a positive contribution to specific outcomes for care-leavers (Stein, 2006b), specifically, in assisting young people in finding and settling in accommodation and in helping young people out of homelessness (Wade & Dixon, 2006) and into education, training and employment (Department for Education, 2013a). It is notable that despite the difficult circumstances surrounding their entry to care, around a half of those leaving care in the UK are engaged in education, employment or training by the time they are nineteen (Department for Education, 2013b). Many young people are also able to identify positive improvements in their life attributable to after care teams (Morgan, 2012). However, it is well recognised that there is still more to be done. Leaving care teams continue to have considerable difficulty obtaining therapeutic support for care-leavers (Andrew *et al.*, 2013; Department of Health, 2009). Traditional ways of working and referral patterns continue to act as barriers to accessing help for young people who have spent time in

care (Golding, 2010) and young people themselves often express dissatisfaction with services (Hiles *et al.*, 2013; Holland *et al.*, 2010; Lamont *et al.*, 2009; The All-Party Parliamentary Group for Looked after Children and Care Leavers, 2013).

1.3.5 Section Summary

Children who grow up in care are a disadvantaged group. Compared to children reared by their birth families, they generally perform less well academically and are more likely to receive criminal convictions. They are also at greater risk of experiencing substance misuse and psychological problems in childhood and as adults. In addition to the detrimental effects on individuals, the direct and indirect effects of children being placed into care places a huge burden on public services and the economy. This is likely to intensify in the coming years as the number of children being taken into care is rising.

Over the past 30 years policy developments have increasingly recognised the needs of current and former recipients of Local Authority care. The development of effective services for this group of people requires a clear understanding of their psychological needs. Looked after children have often experienced significant abuse and neglect, as well as multiple separations from their birth parents and substitute caregivers. The mentalisation-based theoretical model for the development of psychopathology (Fonagy, 1991), with its salient themes of early parent-child relationships, separation and trauma offers a useful framework from which to understand the needs of maltreated children and young people who have been placed into local authority care. According to this model, a prerequisite for optimal psychological functioning is the capacity to infer the mental states of both ourselves and others (e.g. to ‘mentalise’). The model put forward by Peter Fonagy and colleagues proposes that the capacity to mentalise develops within the context of early relationships and is disrupted by trauma. Deficits in mentalising in relation to self and others are proposed to lead to difficulties with emotional regulation, which manifest as behavioural, interpersonal, cognitive and psychological difficulties commonly recognised as ‘psychiatric disorders’. The mentalisation model is rooted in attachment theory. Before moving on to discuss the mentalising model (and one specific aspect of mentalising: social cognition), the following section will offer a brief introduction to attachment theory

and discuss the relationship between attachment, childhood maltreatment, parental separation and psychological adaptation.

1.4 Attachment Theory

1.4.1 Brief origins of attachment theory

John Bowlby's theory of attachment grew out of early psychoanalytic, evolutionary and developmental theory (Bowlby, 1969, 1973). Bowlby was attempting to understand the distress experienced by young children who were separated from their parents (often characterised by crying, clinging, yearning and proximity seeking). Drawing on evolutionary and ethological theory Bowlby proposed that these 'attachment behaviours' were adaptive responses to separation from a primary caregiver. Importantly, they serve an evolutionary function in keeping relatively helpless and dependent infants in proximity to their more able caregiver, who can provide support, care and protection. If the caregiver is consistently available, warm and attentive, the infant is likely to feel secure and loved. Correspondingly, if the caregiver is unavailable or inconsistent in their responses, the infant is likely to feel insecure or anxious. Attachment relationships are characterised by the tendency of infants to use their caregivers as a 'secure base' from which they can explore their environment and socialise with others. According to attachment theory, an infant's repeated experience of caregiving lead to the development of 'internal working models' of beliefs and expectations in relation to the self and others. For example, an infant whose parent(s) are responsive, sensitive and attuned will likely see themselves as important and worthwhile and others as dependable and trustworthy. Internal working models become increasingly stable and resistant to change over time, becoming the basic components of an individual's self-worth and their ability to regulate their expectations and interpretations of others (Bowlby, 1969, 1973). It is through this process that Bowlby proposed that attachment behaviour characterises human experience "from cradle to the grave" (Bowlby, 1979, p. 129).

1.4.2 Individual differences in attachment styles in childhood.

Mary Ainsworth, a colleague of Bowlby's, built upon his work to develop a three category typology of infant attachment styles - primarily by observing infant-parent dyads who were systematically separated and reunited under laboratory conditions

(‘the strange situation’; Ainsworth *et al.*, 1971; Ainsworth *et al.*, 1978). Around 63% of twelve-month old infants became upset when separated from their caregiver, but actively sought their parent and were easily soothed upon their returned. This pattern of behaviour was thought to represent a ‘*secure*’ attachment style. Around 16% of children were observed to be ill-at ease initially, became extremely distressed upon separation and were difficult to soothe after being reunited with their caregiver – approaching the caregiver, but resisting contact or pushing them away. This type of attachment behaviour was labelled ‘*anxious-ambivalent* (or resistant)’. The final attachment pattern identified by Ainsworth and colleagues was called ‘*anxious-avoidant*’. Avoidant attachment behaviour, observed in around 21% of infants, was characterised by minimal distress at separation and little interest when the caregiver returned.

Main and Soloman (1986) later proposed that a group of children, initially considered ‘unclassifiable’ by Ainsworth and colleagues, were displaying attachment behaviour they labelled as ‘*disorganised*’. These children showed a lack of clear attachment behaviour – characterised by strong proximity seeking coupled with strong avoidance. This type of attachment behaviour was thought to be the ‘second generation effect’ of unresolved loss or trauma on the part of attachment figures and was proposed to occur more frequently when caregivers act as both figures of fear and reassurance (Main & Hesse, 1990b). Disorganised attachment is considered to be the most insecure type of attachment (Main & Hesse, 1990a). Owing to the substantial heterogeneity in attachment behaviour displayed by children classified as ‘disorganised’ some have proposed subcategories of this attachment type (Crittenden, 2006; Solomon & George, 1999).

Importantly, Ainsworth and her colleagues were able to demonstrate that individual differences in the ‘strange situation’ correlated with parental sensitivity (Ainsworth *et al.*, 1978). Children who appeared secure often had caregivers who were responsive to their needs. In contrast, those who appeared insecure in the ‘strange situation’ were more likely to have caregivers who were insensitive to their needs, inconsistent or rejecting in the care they provided. Since the early work of Ainsworth and her colleagues, childhood attachment security has been repeatedly linked with the quality of parental caregiving in the home (Belsky & Fearon, 2008; Lyons-Ruth & Jacobvitz,

2008), childhood adversity (Mickelson *et al.*, 1997) and frightening maternal behaviour (Madigan *et al.*, 2006).

1.4.3 Individual differences in adult attachment style

Stemming from Bowlby's key tenet that the attachment system influences behaviour across the lifespan, various researchers have extended attachment theory into adulthood. Hazan and Shaver (1987) were the first to propose that the emotional bond that develops between adult romantic partners is partly a function of the same attachment process that governs infant-caregiver relationships. Drawing on Ainsworth's three-category typology of infant-carer attachment patterns, Hazan and Shaver argued for the existence of three distinct types of romantic attachments in adults: secure, anxious-ambivalent and avoidant. Adults with a secure attachment style find it easy to get close to and depend on others. In contrast, those with an avoidant attachment style find it more difficult get close to and trust others. Finally, those with an anxious attachment style see others as being reluctant to get close and not really caring about them, and are often viewed as 'clingy'. Epidemiological studies have noted a similar prevalence of adult attachment styles to those found in infants: 59% secure; 25% avoidant; 11% anxious; 4.5% unclassified (Mickelson *et al.*, 1997).

Hazan and Shaver's (1987) model was later revised by Bartholomew (1990) and Bartholomew and Horowitz (1991), who put forward a four-category model of adult attachment styles. They retained the secure and anxious-ambivalent (or preoccupied) classifications proposed by Ainsworth (1978) and Hazan and Shaver (1987). However, they differentiated between two types of avoidant styles: fearful and dismissing. Those who are fearfully avoidant long for intimacy, but avoid it, because they fear rejection. In contrast, those who are dismissing are avoidant as a means of maintaining a defensive sense of self-reliance and independence.

Importantly, Bartholomew and Horowitz drew upon the work of Levy and Davis (1988) to propose that their typology characterised adult attachment styles within a two dimensional space defined by people's representation of self and others. Individuals with a secure attachment style were characterised as holding positive working models of themselves (e.g. worthy, lovable) and others (e.g. trustworthy and

responsive) whilst the other attachment classifications result from different combinations of positive and negative models of the self and others (see Figure 1.1).

		Model of Self (Attachment anxiety)	
		Positive (low)	Negative (high)
Model of other (Attachment avoidance)	Positive (Low)	Secure Comfortable with intimacy and autonomy	Preoccupied Preoccupied with relationships
	Negative (High)	Dismissing Dismissing of intimacy Counter dependent	Fearful Fearful of intimacy Socially avoidant

Figure 1.1 Bartholomew and Horowitz’s model of adult attachment styles. Adapted from Bartholomew and Horowitz (1991).

The two dimensional model of attachment which focuses on the model of self and others has been criticised (Fraley *et al.*, 2000), most notably, because the content of the items typically used to assess these dimensions are more consistent with a conceptualisation that focuses on sensitivity to rejection (anxiety) and comfort with depending on others (avoidance). This has led others to propose that two dimensions of attachment behaviour are better thought of in terms of ‘anxiety’ and ‘avoidance’ (Fraley *et al.*, 2000), which has been supported by a range of studies employing different measures of adult attachment (Allen *et al.*, 2001; Brennan *et al.*, 1998; Fraley & Spieker, 2003; Ravitz *et al.*, 2010; Stein *et al.*, 2002). Attachment anxiety is characterised by hyper-activation of the attachment system, which manifests as fear of separation, abandonment and feelings of insufficient love, as well as the preoccupation with the availability and responsiveness of others. Attachment avoidance is characterised by avoidance of intimacy, dependence, self-reliance and relative deactivation of the attachment system. The validity of the Bartholomew and Horowitz four-category model of adult attachment is supported by psychometric studies of the measures that are based on their model; for example the Experiences in

Close Relationships Scale (Fraley *et al.*, 2000) and the Relationship Questionnaire (Bartholomew & Horowitz, 1991).

1.4.4 Issues in the measurement of adult attachment style

A detailed review of the available adult attachment measures is beyond the scope of this thesis (For a detailed review see Ravitz *et al.*, 2010). Instead, the following sections will consider some of the key controversies and dilemmas that have arisen from over 25 years of research into the measurement of adult attachment, each of which merit consideration when selecting an appropriate measure of adult attachment for the current study.

1.4.4.1 Developmental vs. Social psychological approaches

Measures of adult attachment style have either adopted a developmental or a social psychology approach (Simpson & Rholes, 1988). Developmental approaches are typically focused on retrospectively predicting attachment patterns of infants to their caregivers and do not rely on conscious self-evaluation; for example, the Adult Attachment Interview (George *et al.*, 1996), from which an individual's state of mind with regard to childhood experiences with caregivers is inferred from a semi-structured interview. Developmental approaches are thought to be more reliable and valid measures of attachment (Ravitz *et al.*, 2010). However, they have some drawbacks. First, they are time consuming to administer and interpret, requiring significant resources/training. Second, there are ethical issues around the appropriateness of asking about early experiences in a research context, especially in populations where early adversity or abuse are likely to be common (e.g. care-leavers).

Social psychological measures of adult attachment style are more commonly used. Instead of focusing on childhood experiences they ask about conscious attitudes, thoughts and feelings in adulthood, usually with respect to romantic partners. Over 25 such instruments are available (Ravitz *et al.*, 2010) – many of which overlap - including the Adult Attachment Styles Questionnaire (Hazan & Shaver, 1987), the Experience in Close Relationships Scale (Fraley *et al.*, 2000) and the Relationship Questionnaire (Bartholomew & Horowitz, 1991). They are typically easy to use and

interpret; they have well-established reliability; and they have proved useful in testing and confirming fundamental predictions of attachment theory (Ravitz *et al.*, 2010). However, research that questions the continuity of attachment styles over time and across relational contexts indicate that social psychological measures of adult attachment might not necessarily provide insight into childhood attachments (see Section 1.4.4.3 and 1.4.5). They are also subject to response bias, especially in the context of attachment related defences, and have been criticised for being ‘passive’ (e.g. they may miss behaviours/feelings which are only present when the attachment system is ‘activated’; George & West, 2001).

Several studies have compared interview-based studies, based on a developmental approach, with self-report measures that emanate from social and personality psychology traditions (see Ravitz *et al.* (2010) for a review). A meta-analysis, based on a combined sample of 961 individuals found that the correlation between the Adult Attachment Interview security domain and attachment style dimensions from self-report measures was very small ($r=0.09$; Roisman *et al.*, 2007b). This lack of convergence may well reflect the different facets of attachment behaviour assessed by self-report and interview based measures. The former generally focus on conscious appraisals of feelings and behaviours in close relationships, whereas the latter measures unconscious aspects of attachment-related strategies and behaviours. These findings raise questions about the childhood origins of adult attachment style and highlight the need to refrain from discussing results from self-report and interview based studies as if they are interchangeable (Roisman *et al.*, 2007b).

1.4.4.2 Dimensional vs. categorical measurement

Measures of attachment either assign individuals to categories (e.g. those proposed by Hazan and Shaver, 1987; or Bartholomew and Horowitz, 1991) or rate people according to various dimensions of attachment style (e.g. attachment anxiety or avoidance; Fraley *et al.*, 2000). Categorical definitions of attachment are largely derived from the study of infant attachment and are useful for communicating and interpreting patterns of attachment behaviour (Fraley & Waller, 1998). However, both the commonly used categories and the use of categorical approaches have been questioned. For example, the attachment classification systems developed by

Ainsworth and expanded into adulthood by Hazan and Shaver (1987) and Bartholomew and Horowitz (1991) have been criticised for: (1) being overly simplistic, forcing everyone to classify themselves in terms of one of just three or four basic attachment styles; (2) assuming that differences among people within a category do not exist; (3) offering little potential for change or progress; and (4) being culturally bound to the population from which the classifications were derived (middle-income American families in the 1970's) (Crittenden & Landini, 2011; Mikulincer & Shaver, 2007). Indeed, Ainsworth herself was aware of the limitations of three/four category attachment typologies (Landa & Duschinsky, 2013). Other classification systems that allow for greater flexibility over time and propose a broader array of classification categories have been proposed. One such example is the Dynamic Maturational Model that originated from the study of severely maltreated children (Crittenden, 2006). However, they have not received the same level of attention as mainstream three-four category typologies of attachment (Farnfield, 2014).

Other writers have questioned the validity of imposing categories at all (Cummings, 1990; Richters *et al.*, 1988). In fact, most self-report measures actually measure adult attachment in relation to continuous dimensions (Stein *et al.*, 2002). Taxometric studies, which aim to uncover the latent structure of a domain and rigorously test taxonomic assumptions, have provided some insight into the categorical vs. dimensional attachment debate. Analyses in multiple samples and with a range of measures, including the Strange Situation (Fraley & Spieker, 2003), self-reports of attachment in adults (Fraley & Waller, 1998) and the Adult Attachment Interview (Roisman *et al.*, 2007a), have found that variation in attachment is best modelled with dimensions rather than categories. These studies indicate that the imposition of categorical models on attachment variability is likely to be inappropriate, which may lead to erroneous conceptual inferences and statistical error (Fraley & Spieker, 2003). Bartholomew and Horowitz's (1991) four-category model of attachment bridges the gap between categorical and dimensional approaches by defining categories that represent extreme positions on the dimensions of self and others – which map onto the related concepts of attachment anxiety and avoidance (see Figure 1.1).

1.4.4.3 *State or trait*

Attachment researchers have traditionally conceptualised attachment style and internal working models as relatively stable personality ‘traits’ – as if they are fixed and equally influential across a wide array of relational contexts (e.g. parents, friends, partners; Fraley *et al.*, 2011). As such, commonly used attachment measures often instruct participants to think about their relationships in general, rather than to focus on specific relationships. However, the reliance on global measures of attachment has been criticised by those who note that people often hold very different expectations and beliefs about the significant others in their life (Baldwin *et al.*, 1996). Adult attachment style is also partly governed by the behaviour of romantic partners (Kobak & Madsen, 2008), which is likely to vary from relationship to relationship. Several researchers have sought to address this by asking more contextualised questions about attachment (Cozzarelli *et al.*, 2000; Klohnen *et al.*, 2005). One recently developed measure, The Experiences in Close Relationships—Relationship Structures Questionnaire (ECR-RS), aims to assess attachment dimensions in relation to four kinds of relationships: mother, father, romantic partners and friends (Fraley *et al.*, 2011). ECR-RS data collected from over 21,000 online participants found only modest correlations between attachment dimensions across relation domains. This suggests that ‘trait-like’ approaches might miss subtle differences in attachment across contexts. However, the ECR-RS is not without limitations. First, more general, decontextualized measures of attachment (e.g. the Experiences in Close Relationships scale) have been found to have stronger relationships with ‘the Big Five Personality traits’. Second, the ECR-RS lacks reversed scored items, which makes it particularly susceptible to response acquiescence. Regardless of the measure used it is important that researchers decide which type of relationship (e.g. parent, romantic partner, etc.) is most relevant to their research question and to use an instrument that focuses on this.

1.4.5 *Continuity of attachment style across the lifespan*

One of the key tenets of Hazan and Shaver’s (1987) model was that adult attachment behaviours are reflections of the ‘internal working models’ of self and others, which are developed in the context of early caregiving experiences. Like Bowlby (1969, 1973), they believed that these working models were highly resistant to change, because we are more likely to assimilate new relational information, even if this

means distorting it, that we are to accommodate to information which conflicts with our existing beliefs. As such, their model of attachment predicted continuity of attachment behaviour across different relationships over the human lifespan. Even though attachment theory emphasises stability of attachment across the lifespan, it does recognise that some variation is likely – especially in the context of trauma, loss and negative life experiences (Bowlby, 1980).

Anxious and avoidant attachment dimensions in adults are analogous to similar dimensions observed in infants. Cross-sectional studies have found that the prevalence of adult attachment classifications are remarkably similar to those seen in infant populations (Ein-Dor *et al.*, 2010b; Stein *et al.*, 2002; Van Ijzendoorn & Bakermans-Kranenburg, 2008). This suggests that attachments remain stable over the life span. However, longitudinal studies are required to truly determine attachment continuity. Such studies have either focused on short-term stability across infancy, early childhood, adolescence or adulthood; or have assessed long-term continuity from infancy to adolescence and adulthood. Short-term studies have reported concordance rates between repeated attachment-assessments that have ranged from just above those expected by chance to 96%.

A small number of longitudinal studies have investigated the continuity of attachment from infancy to adolescence/adulthood. Waters *et al.* (2000) carried out a 20 year follow up on fifty individuals who had completed the ‘strange situation’ test as babies. They found that 72% of individuals received the same secure/insure attachment classification when assessed using the Adult Attachment Interview. Interestingly, change in attachment classification was correlated with loss of parents, parental divorce, parental/child serious illness, parental mental health problems and abuse. The study by Waters and colleagues included primarily middle-class families – upon which the Ainsworth attachment typology was derived. Similar findings were observed in a study that included children reared in non-conventional family contexts (e.g. by single mothers, domestic living groups, creedal communal groups, unmarried cohabitating couples; Hamilton, 2000). Both of these studies reported attachment stability over long periods, but also highlighted the importance of negative life events. Interestingly, two studies that focused on extremely disadvantaged families, who experienced far greater stressful life events, found no evidence for significant

continuity between infant and adult attachment (Lewis *et al.*, 2000; Weinfield *et al.*, 2000).

In all of the above studies reliability and validity problems inherent in measuring infant and child attachment are likely to account for some of the observed change, for example, imperfect inter-rater and/or test-retest reliability. In a meta-analysis, Fraley (2002) concluded that the available data showed that attachment security is moderately stable across the first 19 years of life. This was taken to support theoretical perspectives which propose that working models are modified as individuals experience new events, but also that representations developed in infancy continue to shape interpersonal behaviour throughout the lifespan. Of particular relevance to the current study are the consistent findings that attachment representations are vulnerable to difficult and chaotic life experiences. Given that care-leavers have often experienced difficult life events (as well as protective events, such as being placed with a supportive foster family, Jacobsen *et al.*, 2014) we need to be especially cautious about assuming that their attachment relationships in adulthood reflect their early experiences.

1.4.6 Attachment and psychological/emotional difficulties in adulthood

Early experiences with primary caregivers have long been considered to have an important impact on future psychological adaptation (Freud, 1905). Attachment theory offers a context for understanding this relationship. Interactions with inconsistent or insensitive attachment figures interfere with the development of constructive and effective affect-regulation strategies, reduce resilience to stressful life events and increase vulnerability to psychological and emotional difficulties in times of crisis (Mikulincer & Shaver, 2012). Recognising this, a whole body of research has sought to link attachment to specific psychological and emotional problems.

Attachment insecurity has been found to be common among adults with a wide range of emotional and psychological problems, in both clinical and non-clinical samples (Van Ijzendoorn & Bakermans-Kranenburg, 2008). Most of the research has been carried out within a psychiatric diagnostic framework. For example, both anxious and

avoidant attachment styles have been associated with depression (Cantazaro & Wei, 2010), anxiety (Bifulco *et al.*, 2006; Bosmans *et al.*, 2010), obsessive-compulsive disorder (Doron *et al.*, 2009), post-traumatic stress disorder (Declercq & Willemsen, 2006; Ein-Dor *et al.*, 2010a), bipolar disorder (Morriss *et al.*, 2009) psychosis (Macbeth *et al.*, 2011) and eating disorders (Illing *et al.*, 2010; Zachrisson & Skarderud, 2010). Attachment insecurity and attachment related affect-regulation strategies are also key components in psychological and emotional difficulties often diagnosed as ‘personality disorders’ (Crawford *et al.*, 2007; Fonagy *et al.*, 1996; Lorenzini & Fonagy, 2013). A range of studies, which have assessed attachment via interview and self-report, suggest that only around 6-8% of those meeting psychiatric diagnostic criteria for borderline personality disorder have a secure attachment style (Levy, 2005). This is perhaps unsurprising as diagnostic criteria for personality disorders predominantly include interpersonal and emotional regulation difficulties (American Psychiatric Association, 1994; World Health Organisation, 1992). Van Ijzendoorn *et al.* (2008) performed a large meta-analysis of 105 studies of clinical populations, including more than 4200 individuals assessed using the Adult Attachment Interview. They found that internalising problems tend to be characterised by a high prevalence of ‘preoccupied’ attachment representations, whereas externalising problems were more strongly associated with dismissing attachment styles.

The association between attachment and psychological difficulties does not imply cause and effect. Some have questioned whether attachment difficulties are necessary or sufficient to cause mental health problems (Mikulincer & Shaver, 2012). Indeed many people with ‘insecure’ attachment types do not experience significant psychological difficulties (Riggs & Jacobvitz, 2002) and a proportion of those in clinical samples have ‘secure attachments’ (Van Ijzendoorn & Bakermans-Kranenburg, 2008). It could be that attachment and psychological problems overlap because both are influenced by a common third variable. Several studies have sought to identify factors that could mediate and moderate the relationship between attachment security and psychological problems; for example stressful life events (Mikulincer & Shaver, 2007), self-criticism (Wei *et al.*, 2006), emotional regulation (Berant *et al.*, 2008; Sroufe, 2005), interpersonal difficulties (Larose & Bernier, 2001)

and maladaptive schema (Bosmans *et al.*, 2010). Others have suggested that genetic influences mediate the link between attachment insecurity and psychological problems (Crawford *et al.*, 2007). However, this seems unlikely given that evidence from genome-wide association studies suggests that only a very small proportion of the variation in risk for psychiatric disorders is due to genetic variation (e.g. Hamshere *et al.*, 2013; Ripke *et al.*, 2013). The causal links between attachment and psychopathology are further complicated by prospective studies, which have found psychological problems can increase attachment insecurity (Davila *et al.*, 1997; Solomon *et al.*, 2008). Further long-term longitudinal or experimental-intervention studies are required to determine whether attachment styles *cause* psychological difficulties.

1.4.7 Attachment and the effects of early abusive or neglectful relationships

The majority of young people are brought into care as a direct result of experiencing abuse or neglect (Department for Education, 2013b; Welsh Government, 2013). A growing body of research is beginning to elucidate the strong link between childhood abuse and later psychological adjustment. For example, prospective population-based studies have demonstrated that people who are abused as children are nine times more likely to be diagnosed with psychosis later in life – rising to 48 times more likely for those who experience the severest forms of abuse (Janssen *et al.*, 2004). These findings have been replicated in other large population-based studies (Schreier *et al.*, 2009; Shevlin *et al.*, 2007) and confirmed in a large meta-analysis investigating the link between childhood adversity and risk of psychosis (Varese *et al.*, 2012). The relationship appears to be at least partially causal: there is a dose dependent relationship between abuse and the severity (Spauwen *et al.*, 2006), frequency (Shevlin *et al.*, 2007) and number (Scott *et al.*, 2007) of psychological problems experienced by survivors. This finding have been replicated in other large prospective studies (Janssen *et al.*, 2004; Schreier *et al.*, 2009; Shevlin *et al.*, 2007), even after controlling for factors such as substance abuse, education, deprivation and gender (Schreier *et al.*, 2009).

Several authors have proposed that attachment is an important mediator between early trauma and later psychological and emotional difficulties (Berry *et al.*, 2008;

Crittenden, 2006; Fonagy & Bateman, 2008; Macbeth *et al.*, 2008; Riggs, 2010). Attachment theory posits that those who experience childhood adversity are more likely to develop insecure attachment representations (Ainsworth *et al.*, 1978; Bowlby, 1969; Main & Solomon, 1986). As highlighted in the previous section, disturbed attachment representations can increase the risk of psychological problems. This has been supported by empirical research that has demonstrated that children who experience abuse or who are raised in abusive families are more likely to have an insecure attachment with their caregivers (Cicchetti & Toth, 1995; Deoliveira *et al.*, 2004; Finzi *et al.*, 2000; Sroufe, 2005) and go on to have insecure romantic attachment relationships as adults (Kapeleris & Paivio, 2011). Specifically, trauma and neglect have been linked to attachment avoidance (Carpenter & Chung, 2011) and to disorganised attachment (Lyons-Ruth *et al.*, 2004; Scott, 2011). In a large nationally representative study in the US, childhood interpersonal traumas (e.g., physical abuse, serious neglect) had the most consistent association with avoidant and anxious adult attachment out of a comprehensive list of potential life traumas (Mickelson *et al.*, 1997). The hypothesis that attachment mediates or moderates the link between early maltreatment and adult psychological problems has not been tested directly (Riggs, 2010). However, there is evidence that attachment avoidance and anxiety mediate the relationship between childhood emotional abuse and functioning in adult romantic relationships (Riggs *et al.*, 2011)

1.4.8 *Attachment in looked after children*

Children are born biologically predisposed to form attachment relationships to their caregivers (Mikulincer & Shaver, 2005) – even in the context of abuse (Fonagy, 2001). This means that young people who are brought into care following neglect or abuse by their caregiver have often suffered a double insult; first, the damaging effects of unresponsive, inconsistent or frightening parenting, and second, the often sudden loss of attachment relationships (Bruskas & Tessin, 2013).

Several studies have focused on attachment in children in care. In 2009, Van Den Dries *et al.*, 2009 performed a meta-analysis of studies of attachment relationships in children who have been adopted (17 studies) or placed in foster care (11 studies). They reported that adopted children showed fewer secure attachments than non-

adopted children (47% compared to 62%) and more disorganised attachments (31% compared to 15% in non-adopted children). Notably, the difference in attachment insecurity was much greater in children taken into care after the age of 12 months compared to those adopted before the age of 12 months. Attachment security and disorganisation were similar for adopted children and foster children.

It should be noted that studies of attachment in looked after children have predominantly focused on those aged under four years of age (Van Den Dries *et al.*, 2009). There are many reasons to think that these findings might not generalise to older populations. First, age at being taken into care is an important predictor of attachment security, as well as other indicators of adaptive functioning (Rutter *et al.*, 2007; Van Den Dries *et al.*, 2009). Second, children adopted later in life may have been exposed to abuse and neglect for a greater period of time. Third, children taken into care later in childhood are more likely to experience placement breakdowns, which will interfere with the development of secure attachment relationships. Finally, those taken into care early in life may have had further opportunity to develop secure attachments with alternate carers. Studies have shown that adoption can act as an opportunity to ‘catch up’ in terms of attachment. In particular, reductions in attachment disorganisation have been noted in children who are placed with families where at least one adoptive parent has a secure attachment style (Dozier *et al.*, 2001; Pace & Zavattini, 2011; Steele *et al.*, 2008).

Despite the elevated prevalence of attachment insecurity in those placed for adoption and in foster care, these children still compare favourably to those raised in institutional care – where attachment disorganisation has been found in as many as 66% of children (Vorria *et al.*, 2003; Zeanah *et al.*, 2005). This is similar to the prevalence of attachment disorganisation observed in children who have been maltreated (Cicchetti & Barnett, 1991; Finzi *et al.*, 2000) and substantially higher than in children reared by their birth parents (~11-15%; Barone *et al.*, 2009; Van Ijzendoorn *et al.*, 1999). The difference in attachment between children in institutional care and adoptive/foster care could reflect underlying differences between the two groups (e.g. exposure to abuse, neglect or maltreatment). Studies of children raised in profoundly depriving institutions in Romania in the early 1990’s have found that they have more common and marked attachment difficulties than

children adopted within the UK (Rutter & O'Connor, 2004). Furthermore, a child's duration of exposure to institutional rearing has been shown to be associated with more pronounced attachment difficulties at age 6, as well as greater persistence of attachment problems between age 6 and 11 (Rutter *et al.*, 2007). These findings indicate that the severity and duration to exposure of adversity are, unsurprisingly, important predictors of attachment difficulties in looked after children

1.4.9 *Attachment in care-leavers*

Despite the known impact of abuse and loss on attachment representations and the strong relationship between attachment and later psychological adaptation, there is a relative scarcity of research looking at attachment in young people leaving the care system.

Two studies have compared attachment styles in adults who were either raised by adopted parents or by their birth parents. Both reported that former adoptees had either less secure or more anxious and preoccupied attachment styles as adults (Borders *et al.*, 2000; Feeney *et al.*, 2007). By contrast, a previous doctoral thesis, carried out in a similar population to the current study, noted that attachment related anxiety and avoidance did not differ between adolescent care-leavers and a demographically matched comparison group of non-care-leavers (Paull, 2013). This study was cross-sectional and was not primarily aimed at comparing attachment in care-leavers and non-care-leavers. This makes interpretation of the findings difficult. It is possible that those in the care-leaver groups had 'caught up' in terms of attachment over time – either through experiences in care or through psychological therapy. Furthermore, attachment insecurity in the *non-care* leaver group was higher than in other samples of adolescents (Bosmans *et al.*, 2010), which could have distorted the findings.

There are still significant questions about the impact of spending time in care on attachment in adulthood. Given that attachment style (Van Ijzendoorn & Bakermans-Kranenburg, 2008), childhood maltreatment (Varese *et al.*, 2012) and spending time in care (Ford *et al.*, 2007) are strong predictors of psychological distress in adulthood, it seems important to further understand the relationship between these factors.

1.5 Mentalisation & social cognition

1.5.1 *Mentalisation-based model for the development of psychopathology*

Over the past 25 years, attachment theory has been expanded and further developed by Peter Fonagy and Anthony Bateman, who coined the term "mentalisation" (Fonagy, 1989) and developed the mentalisation-based model of psychopathology. The concept of mentalisation describes our ability to make sense of the social world by implicitly and explicitly inferring the mental states of both ourselves and others. It comprises both cognitive (reasoning about beliefs and intentions) and affective (reasoning about emotions) components. The capacity to mentalise is essential for social and behavioural functioning (Brothers, 1990) and is thought to develop in the context of our early relationships with caregivers. Our understanding of others depends on whether as infants our own mental states were adequately understood and mirrored by caring, attentive and non-threatening caregivers. A primary caregiver's failure to accurately mirror a child's mental states can give rise to difficulties in knowing oneself and in empathising – or in other words an inability to 'mentalise' (Meins *et al.*, 2002; Murray & Andrews, 2005). According to this model, secure infant-caregiver attachments develop through the accurate and contingent mentalisation of the child by the parent (Fonagy *et al.*, 2002). Conversely, unresponsive or neglectful parenting and/or early psychological trauma undermine the capacity to think about mental states of others, resulting in hyper-responsiveness of the attachment system in interpersonal contexts. Amongst other things this can lead to problems with emotional regulation and attentional control (Posner *et al.*, 2002). If left untreated, these difficulties can persist into adulthood (Levy, 2005). The mentalisation-based theoretical model for the development of psychopathology is depicted in Figure 1.2.

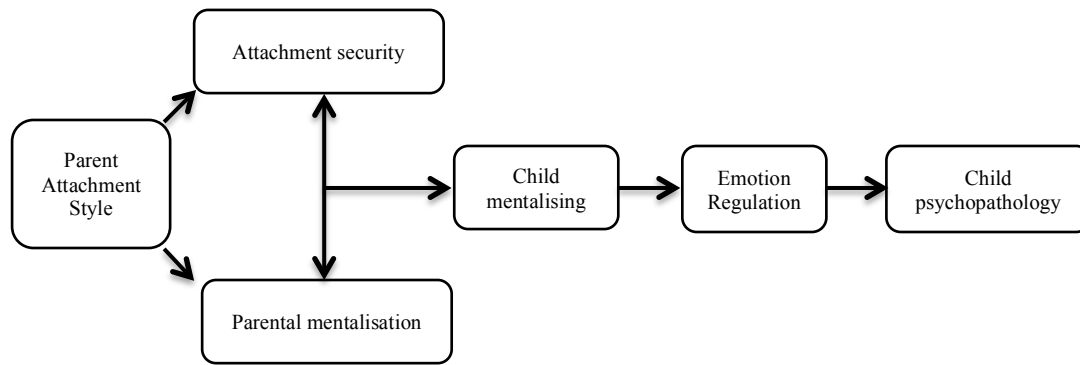


Figure 1.2 The mentalisation-based theoretical model for the development of psychopathology. AAI = Adult attachment Interview and reflects parents attachment style (adapted from Sharp and Fonagy, 2008).

The mentalisation-based model of psychopathology provides a theoretical understanding of how early-life experiences can set the stage for later development of behaviours often diagnosed as psychiatric problems (Fonagy, 1991). Given its broad scope, most psychological and emotional problems will involve some difficulties with mentalisation (Bateman & Fonagy, 2010). However, deficits in mentalisation have been proposed to be at the core of several psychological problems, including PTSD (Allen, 2001), eating disorders (Skarderud, 2007b), depression, (Allen *et al.*, 2003) and psychosis (Frith, 2004). In particular, mentalisation theory and the subsequent intervention techniques have been most clearly developed with respect to difficulties underpinned by emotional dysregulation (e.g. ‘borderline personality disorder’ (BPD); Bateman & Fonagy, 2004). Mentalisation based treatments have displayed some promise in helping those meeting diagnostic criteria for BPD to achieve improvements in self-harm, inpatient admissions, medication use, depression, anxiety, symptom distress, interpersonal functioning and social adjustment (Bateman & Fonagy, 1999). Many of these gains were sustained at 18-month follow-up and in some cases showed continued improvement three (Bateman & Fonagy, 2001) and eight years (Bateman & Fonagy, 2008a) post baseline.

The mentalisation-based theoretical model for the development of psychopathology (Fonagy, 1991) offers a useful framework for considering the psychological needs of

those who have spent time in care - a group of young people at increased risk of maltreatment, attachment difficulties and psychological problems.

1.5.2 Dimensions of mentalisation

Bateman and Fonagy describe mentalisation as the process by which we implicitly and explicitly interpret the actions of others and ourselves as meaningful by imagining the mental states (e.g. beliefs, motives, emotions, desires, needs) that underpin our own and others' behaviours (Bateman & Fonagy, 2008b; Fonagy, 1991). It is multifaceted and overlaps with other concepts such as empathy, mindfulness, psychological mindedness, affect consciousness, meta-cognition, mind reading, theory of mind, reflective functioning and emotional intelligence (Allen *et al.*, 2008; Choi-Kain & Gunderson, 2008; Lysaker *et al.*, 2011).

Critics and proponents alike have criticised the concept of mentalisation as being “all encompassing... potentially beyond manageable bounds” (Allen, 2006, p12). This has prompted others to further define the concept and its various dimensions (Choi-Kain & Gunderson, 2008; Fonagy & Luyten, 2009; Lecours & Bouchard, 2011). Mentalisation can be thought of along four core dichotomies (Choi-Kain & Gunderson, 2008; Fonagy & Bateman, 2011): 1) implicit and explicit functioning; 2) relating to self or other; 3) involving cognitive or affective aspects, and 4) internally or externally focused. Choi-khan and Gunderson (2008) adopted the first three of these dimensions to illustrate how mentalisation can be mapped onto the related concepts of mindfulness, psychological mindedness, empathy and affect consciousness as represented in Figure 1.3. These dimensions, described briefly in the following section, offer a framework for understanding the way mentalisation relates to overlapping constructs such as social cognition, empathy, mindfulness, alexithymia, emotional intelligence, psychological mindedness and insight.

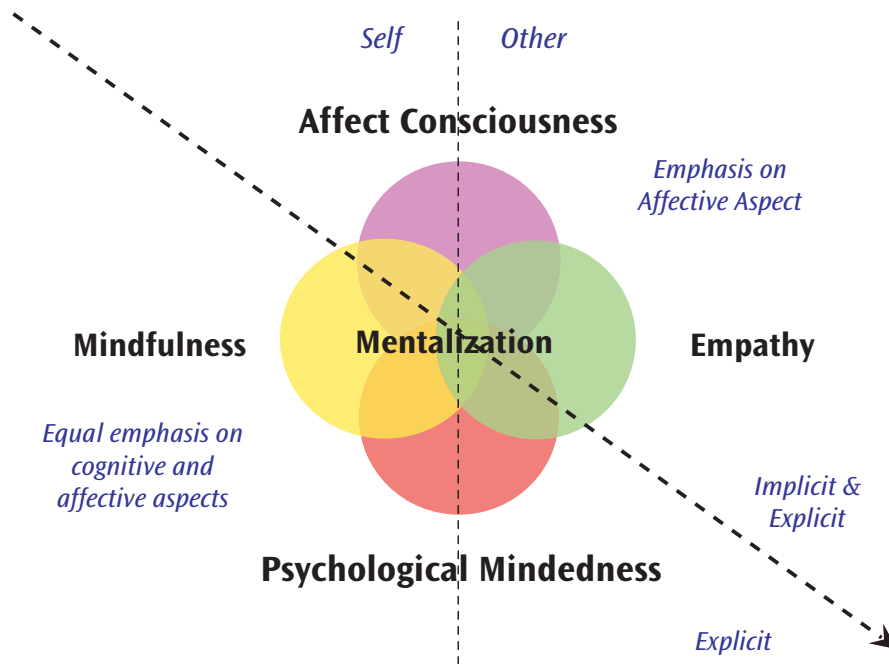


Figure 1.3 Venn diagram representing the overlap between mentalisation and the related concepts of mindfulness, psychological mindedness, empathy and affect consciousness (represented by the four circles). Taken from Choi-Khan and Gunderson (2008).

1.5.2.1 Implicit-automatic versus explicit-controlled mentalising

Traditionally it was believed that complex inferences about the intentions, desires and beliefs of others required significant explicit (or conscious) mental effort (Van Overwalle & Vandekerckhove, 2013). However, behavioural research in the 1980's found that such inferences are commonly made automatically with little conscious control (Winter & Uleman, 1984). This gave rise to 'dual process' theories of cognition, which differentiated between *implicit* (or automatic) and *explicit* (or controlled) modes of processing (Chaiken & Trope, 1999). Explicit-controlled mentalisation is conscious, interpreted, verbal and reflective in nature. By contrast, implicit mentalisation refers to our unconscious and automatic ability to imagine our own and others' mental states, which happens reflexively and largely outside the realm of conscious control.

The concept of implicit and explicit processing has recently begun to be applied to mentalisation (Fonagy & Luyten, 2009). This has built on a number of observations. First, many psychological problems are associated with a lower threshold for

activation of the flight or fight response (Jogems-Kosterman *et al.*, 2007). Second, arousal shifts focus from explicit to implicit modes of mentalisation (Lieberman, 2007). Finally, inhibition of implicit forms of mentalisation in insecurely attached individuals appears more difficult under stress or threat (Edelstein & Gillath, 2008; Hill *et al.*, 2008a; Mikulincer *et al.*, 2002). The mentalisation model of psychopathology proposes that these heightened stress responses (especially in attachment contexts) lead to the apparent loss of explicit mentalisation capacity and over-reliance on implicit mentalisation, especially at times of high arousal (Fonagy & Luyten, 2009).

1.5.2.2 Mentalisation in relation to self or other

The second dichotomy, relating to self or other, recognises that we all have a set of feelings, thoughts, motives, beliefs, desires and needs – and that we are able to recognise and reflect on our own mental states as well as those of others.

Mentalisation in relation to oneself requires self-recognition, self-reflection and self-knowledge (Lieberman, 2007). Our ability to understand the mental states of others, in its strictest sense, is often referred to as ‘social cognition’ (Lieberman, 2007). This involves recognising that other people have thoughts and feeling that are different from our own and draws on our ability to use knowledge about the social world and how our own minds operate to make inferences about the mental state of others.

However, the subjective nature of thoughts, feelings and intentions means that we are not always able to accurately predict the internal world of others (Gilbert & Malone, 1995).

The processes of thinking about self and others are linked. For example, there is evidence that individuals who are able to reflect on and retrieve episodes from their own life narrative are more able to correctly interpret the thoughts and emotions of others (Dimaggio *et al.*, 2008). Also, self-rated emotional awareness is positively correlated with social competence (Steele *et al.*, 2002) and neuroimaging studies suggest that common brain processes underpin mentalisation in relation to self and other (Uddin *et al.*, 2007). Within a mentalisation framework, inference of the mental states of self and others are interactively linked. For example, the process of

imagining our own thoughts and feelings allows us to predict what is in the other's mind, and vice versa (Choi-Kain & Gunderson, 2008).

1.5.2.3 Cognitive versus affective mentalisation

Another dichotomy relates to cognitive and affective aspects of mentalising activity (Choi-Kain & Gunderson, 2008). Cognitive aspects of mentalisation refer to the ability to take another's perspective and infer their mental states. For example, "John wants Jack to go to the party". In contrast, affective mentalisation refers to when representations of other's emotions are consistent with the self-affective state. For example, "I feel frustrated that Jack doesn't want to go to the party". This overlaps with the construct of "emotional empathy" (Baron-Cohen *et al.*, 2008; Mehrabian & Epstein, 1972). The *content* of our inferences can also be affectively or cognitively focused to varying degrees. For example, "Jack wants to..." (cognitive) or "Jack is feeling..." (affective). The effective integration of cognitive and affective aspects of understanding mental states facilitates more developed social understanding (Allen *et al.*, 2008).

1.5.2.4 Mentalisation based on internal versus external features of self and others

Social psychological and imaging studies have identified a clear division between: (1) tasks that focus on the internal psychological worlds of ourselves and others (e.g. thoughts, feelings and experiences) and (2) tasks that focus attention on the external social world and physical characteristics of those within it (e.g. visual appearance of others) (Fonagy & Luyten, 2009; Lieberman, 2007). This distinction runs orthogonal to self and other processing, providing two clear dimensions. For example, we can focus on the internal or external worlds of both others and ourselves.

1.5.2.5 Mentalisation dimensions summary

As described, there are several dimensions to mentalisation ability: (1) implicit and explicit functioning; (2) relating to self or other; (3) involving cognitive or affective aspects; and (4) internally or externally focused. Individuals vary in their ability to mentalise across these the domains. For example, alexithymia is characterised by deficits in explicit processing of self-orientated emotional states (Sifneos, 1973), whilst people with Autistic Spectrum Conditions typically display deficits in other-orientated mentalisation (Baron-Cohen *et al.*, 1985). One component of mentalisation

that has received significant attention over the past 25 years is social cognition – e.g. the implicit and explicit process of inferring the cognitive and affective state of others based on their internal and external features.

1.5.3 *Social cognition*

The terms ‘mentalisation’ and ‘social cognition’ are often used interchangeably. Mentalisation is a broader term and encompasses our ability to interpret the mental states of both others *and* ourselves (Choi-Kain & Gunderson, 2008), whereas strictly speaking, social cognition refers more specifically to our ability to make implicit and explicit inferences about the cognitive and affective states of *others*. This is crucial for successful social interactions (Brothers, 1990). Theoretical propositions, experimental research and neuroimaging studies suggest that the ability to infer the mental states of self and others are linked (Dimaggio *et al.*, 2008; Fonagy, 1989; Uddin *et al.*, 2007). However, evidence from a wide range of studies in clinical and non-clinical samples suggests that the capacity to think about our own thoughts and feelings and the ability to make inferences about the internal world of others are not reducible to one another (Dimaggio *et al.*, 2008; Saxe *et al.*, 2006). For example, individuals may be skilled at one of these activities, but not the other. As such, a wealth of research over the past 25 years has focused specifically on the mental operations that underlie social cognition and its correlates (Lieberman, 2007; Sharp & Venta, 2012).

The difficulty in defining social cognition is further complicated by the variety of labels it is given in the literature, including: theory of mind, affect recognition, mind reading, empathy, emotional intelligence and attributional style (Lysaker *et al.*, 2013). Social cognition is generally considered an umbrella term to capture a range of related domains. In the US, the National Institute of Mental Health has helpfully delineated five dimensions within social cognition: theory of mind, social perception, social knowledge, attributional bias and emotional processing (Green *et al.*, 2008). However, it is well recognised that the boundaries between these dimensions are not absolute and there is considerable overlap between the terms (Samame, 2013). For example, theory of mind inferences will depend on social perception and emotional processing, as well as being influenced by attributional bias. Another important

differentiation has been made between cognitive and emotional elements of social cognition (Kalbe *et al.*, 2010). Cognitive aspects are the abilities involved in making inferences about others people's beliefs, recognising that others hold different perspectives from our own. Emotional aspects of social cognition refer to the capability to infer other's emotions, and involves emotional knowledge, recognition, processing and empathy (Samame, 2013).

Much of the research on social cognition stems from observations that individuals differ in their social cognitive capacity. This was demonstrated most convincingly by the seminal work of Baron-Cohen and colleagues in the 1980's – who identified deficits in social cognition amongst those diagnosed with autism (Baron-Cohen *et al.*, 1985). Fonagy and colleagues propose that acquisition of social cognitive abilities is a developmental achievement that depends on the quality of attachment relationships and exposure to early trauma (Fonagy & Luyten, 2009). Research from a number of disciplines has demonstrated that specific and global deficits in social cognition are associated with psychological difficulties in children and adults (see Section 1.5.7). The following section includes a brief critical review of how social cognition has been measured in empirical settings. Following this, studies that have sought to establish the link between social cognition, attachment, trauma and psychological difficulties will be discussed.

1.5.4 Measuring social cognition

A wide variety of tests have been developed to measure social cognition and these vary in focus, complexity and stimuli. Experimental paradigms have been used to measure very specific aspects of social cognitive processing (e.g. attention to, recall and perception of social information); for example, research looking at engagement with positive and negative social stimuli (e.g. faces); or at memory for different types of social information. Studies using these methods have been successful in identifying correlates between specific aspects of social information processing and a wide range of clinical problems (Achim *et al.*, 2013). However, in order to isolate the variables of interest, these paradigms are often overly simplified, artificial, uni-modal and lacking in ecological validity.

Researchers have sought to develop more comprehensive standardised measures of social cognition. Several have emerged out of developmental research into ‘theory of mind’ and were primarily developed for use with children or those with autistic spectrum conditions (Green *et al.*, 2008). More complex tests of social cognition have been developed for use in adults. ‘Classical’ theory of mind tests have generally used static stimuli presented visually (e.g. cartoons) or linguistically (e.g. stories) with limited context (e.g. the strange stories, Happe, 1994; the Hinting task, Corcoran *et al.*, 1995; Reading the Mind in the Eyes test, Baron-Cohen *et al.*, 2001; and the False-belief and deception stories, Frith & Corcoran, 1996). They are typically more complex and include more items than tasks designed for use with children. However, they have been criticised for lacking ecological validity, being overly simplistic and relying on too few indicators or cues (Achim *et al.*, 2013). For example, they tend to present stimuli in one modality (e.g. visually or verbally), whereas in ‘real life’ social cognition relies on several sources of information. Real-life social cognition is also influenced by movement and non-verbal cues (e.g. body language; Ambadar *et al.*, 2005). Others have noted that many of these tasks are insufficiently challenging (Happe, 1994) and lack divergent validity for difficulties other than autism spectrum conditions (Sharp, 2006).

Contemporary approaches have sought to develop ecologically valid measures of social cognition (Dziobek *et al.*, 2006a). There has been a recent trend toward using tasks extracted from real-life situations. Several measures have used readily available video extracts, including the ‘Awkward Moment Test’, which asks participants to answer mental state and non-socially related questions about characters from TV commercials (Heavey *et al.*, 2000) and the Moral dilemmas task, which asks about scenarios from the TV series ‘House’ (Barnes *et al.*, 2009). However, this introduces bias as the actors and contexts are likely to be differentially known by participants. Most ‘ecological tests’ of social cognition have also presented independent, isolated video clips which prevents participants observing characters over time (as often happens in naturalistic settings). In addition, they have been criticised for focusing exclusively on either affective (e.g. inferences about emotions) or cognitive mental state reasoning (e.g. inferences about beliefs, thoughts), as well as not allowing qualitative interpretation of styles of mental state inferencing (e.g. they tend to focus

on dichotomous ‘right or wrong’ response keys; Dziobek *et al.*, 2006a). As pointed out by Frith (2004) there are differences in erroneous social cognitive judgements. For example, some people are more likely to ‘undermentalise’ (e.g. predict behaviour on the basis of the actual state of the world rather than beliefs), whereas others are more likely to ‘overmentalise’ (e.g. predict behaviour on the basis of exaggerated inferences about the affects/intentions of others).

More recently the ‘Movie for the Assessment of Social Cognition’ (MASC) has been developed (Dziobek *et al.*, 2006a). The MASC is a 15-minute film displaying social interactions between four characters. Participants are asked to respond to multiple-choice questions assessing their recognition of both the cognitive and affective states of the movie characters. Importantly, it allows for qualitative interpretation of multiple-choice responses – for example differentiation between correct, under and over-interpretative mental state inferencing. The real-life setting allows for a more ecologically valid measurement of social cognition and has been used to identify impairments in social cognition amongst those experiencing various forms of psychological and emotional difficulties (see Section 1.6).

1.5.5 *Social cognition and attachment*

Attachment theory and the mentalisation-based theoretical model propose that social cognition emerges within the context of attachment relationships (Bowlby, 1969; Fonagy & Bateman, 2008). It is hypothesised that secure attachment relationships facilitate our ability to understand the behaviour of others in terms of their likely thoughts, feelings, intentions and desires. Conversely, Fonagy and colleagues propose that disruptions in early attachment and trauma can reduce social cognitive capacity, primarily as defensive mechanisms protect children from contemplating their caregiver’s negative feelings about them (e.g. that they are worthless or that their caregiver wishes to harm them; Bowlby, 1980; Fonagy, 2000). In the long-term, defensive disruption in the capacity to infer mental states leaves individuals ‘operating on inaccurate schematic impressions of thoughts and feelings’ (Fonagy, 2000, p. 1133), which can increase vulnerability to emotional regulation difficulties and psychological distress. The relationship between social cognition, attachment and childhood maltreatment has been well studied in children and adults. Evidence can be

drawn from two types of studies; first, experimental and observation studies which focus on individual facets of social cognitive processing (e.g. attention to, recall and perception of social information) and, second, studies which focus on the broad definition of social cognition (e.g. studies which utilise classical and ecologically valid theory of mind tasks). These studies will be outlined in the following sections.

1.5.5.1 In childhood

Bretherton et al. (1979) first reported a relationship between attachment in infancy and early social understanding. Since then several studies have found that infant attachment is associated with attention to and memory for social information. For example, experimental studies have found that securely attached children as young as 12-16 months old attend to unresponsive caregiver stimuli for longer than insecurely attached infants (Johnson *et al.*, 2010). Similar findings have been reported in older children. For example, longitudinal studies have demonstrated that children in middle childhood who were classified as insecurely attached as babies show greater difficulty attending to family photographs (Main & Solomon, 1986), recalling attachment-related information (Belsky *et al.*, 1996; Kirsh & Cassidy, 1997) and acknowledging the distress of others (Steele *et al.*, 2002) compared to securely attached children. Interestingly, there appears to be some cognitive biases in the recall of attachment related information. Children classified as secure in infancy have been found to recall more positive social events from a puppet show, whereas children who had insecure attachment classifications recalled more negative social events (Belsky *et al.*, 1996). These findings have been replicated elsewhere (Clark & Symons, 2009) and similar relationships have been found in adolescents asked to recall a staged parent-child conflict (Dykas *et al.*, 2010). Others have noted a relationship between attachment and the ability to interpret both the behavioural intentions and emotions of others. For example, De Rosnay & Harris (2002) found that those with lower attachment security were less able to understand emotions of others in a variety of situations. Securely attached children have also been found to be more likely to make positive intentional attributions of ambiguous peer behaviour. Whereas children insecurely attached as infants have been shown to make more negative interpretations of their peers behaviour and feelings (Clark & Symons, 2009; Raikes & Thompson, 2008; Suess *et al.*, 1992; Ziv *et al.*, 2004).

Failure to attend to and recall attachment related information is consistent with theoretical predictions that infants suppress their attention to distressing attachment related information (Dykas & Cassidy, 2011). However, there are other explanations for less well-developed social cognitive ability in insecurely attached individuals. For example, maternal mind-mindedness (appropriate use of mental state talk by caregivers) might mediate the relation between attachment and social cognition (Meins, 1997). This is supported by studies that have found that maternal mind-mindedness is more important than attachment style in predicting emotional understanding and social cognitive abilities in children (Laranjo *et al.*, 2010; Meins *et al.*, 1998). Others have suggested that ‘social safeness’ mediates the relationship between attachment and social cognition (Liotti & Gilbert, 2011), drawing on findings showing that threat leads to the activation of the attachment system and also to the inhibition of mentalisation (Posner *et al.*, 2002). Finally, it has also been suggested that the relationship between attachment and social cognition maybe bi-directional (Hunefeldt *et al.*, 2013). For example, impaired social cognition may act as barrier to developing secure attachment relationships – as observed in Autistic Spectrum Conditions (Rutgers *et al.*, 2004).

Regardless of the precise mechanisms that link attachment with social cognition, longitudinal studies have generally found that children with secure attachments as infants perform better in classical theory of mind tasks in early (Mcelwain & Volling, 2004, Fonagy, 1997) and middle childhood (Colle & Del Giudice, 2011; Fonagy *et al.*, 1997; Steele *et al.*, 1999), as well as into adolescence (Ammaniti *et al.*, 1999). Similar findings have also been reported in cross-sectional studies (Barone & Lionetti, 2012b; De Rosnay & Harris, 2002; Fonagy *et al.*, 1997; Humfress *et al.*, 2002; Hunefeldt *et al.*, 2013). It should be noted that not all studies have identified an association between attachment and the ability to infer the mental state of others (e.g. Meins *et al.*, 1998; Meins *et al.*, 2003; Symons & Clark, 2000). However, these studies have often relied on small samples, which is likely to give rise to false-negative results.

1.5.5.2 *In Adulthood*

Given the hypothesised continuity of attachment styles over time, we might expect to observe links between attachment and social information processing in adulthood. Similar to studies in childhood, research in adults has sought to establish the relationship between attachment and sub-facets of social information processing (attention, recall, processing) or has utilised broader measures of social cognition (e.g. classical theory of mind tasks). Findings in children and adults are largely consistent.

Insecure adults have been shown to attend to negative and threatening social information differently to adults with secure attachment representations. For example, adults with dismissive or preoccupied attachment classifications, assessed using the Adult Attachment Interview, have been shown to attend more readily to images that contain relational information or negative affect (Maier *et al.*, 2005) and show greater attention to negative social stimuli (Atkinson *et al.*, 2009). Similar findings have been found in relation to adult romantic attachment security measured using the Experience of Close Relationships scale (Dewitte & De Houwer, 2008; Dewitte *et al.*, 2007). Interestingly, avoidant attachment style in adults has been shown to be associated with the suppression of attachment-related social information using an emotional Stroop task (Edelstein & Gillath, 2008). In contrast, those who score highly on measures of attachment anxiety attend more readily to attachment-related information (Dewitte *et al.*, 2007). These findings suggest that those with different insecure attachment styles might exhibit qualitatively different biases in social cognitive processing. For example, those with anxious attachment styles may be overly attuned to emotional information, whereas avoidant individuals may limit attention to potentially distressing information.

Studies also show that memory of social information in adults differs as a function of attachment style (Sutin & Gillath, 2009; Zeijlmans Van Emmichoven *et al.*, 2003). Interestingly, this relationship also seems to be linked to defensive suppression (Dykas & Cassidy, 2011). For example, Fraley & Brumbaugh (2007) found that highly avoidant individuals recall less information from a tape-recorded clinical interview of a woman describing her family relationships, even when offered a cash incentive to recall information. Similar findings have been found in relation to

avoidant attachment and autobiographical memory (Mikulincer & Orbach, 1995; Sutin & Gillath, 2009). Attachment has also been shown to be linked to biases in perception, expectations and attributions in social contexts. Similar to findings in younger people, insecure adults are more likely to make negative and hostile attributions of the behaviour and mental states of others (Leerkes & Siepak, 2006; Pereg & Mikulincer, 2004).

In contrast to experimental studies that focus on certain facets of social information processing, the literature exploring the relationship between classical and ecologically valid theory of mind tasks and attachment in adults is relatively sparse. Two studies have been carried out in the context of psychosis. One study has tested the relationship between attachment and reflective function – a measure of an individual's understanding of the thoughts, feelings, intentions and goals of self and others (Macbeth *et al.*, 2011). This study found that those with dismissive attachment classifications had worse reflective functioning compared to those who were classified as secure or preoccupied. However, the relationship between reflective functioning and attachment in this sample is perhaps unsurprising given that they are both derived from interpretations of the same Adult Attachment Interview. Furthermore, the reflective functioning measure offers little insight into the qualitative differences in mentalisation between individuals. For example, 'lack of mentalisation ability' and 'over-interpretative mentalisation' are scored the same even though they most likely represent quite distinct deficits. Another study failed to find any association between attachment and theory of mind in a sample of individuals with first-onset psychosis and 'healthy controls' (Korver-Nieberg *et al.*, 2013). However, this study employed a measure of theory of mind that focused on 'perspective taking' in relation to what another person can and cannot see – which probably draws on different skills to those required to interpret the mental state of others in relation to intentions, beliefs, expectation and emotions. It is reasonable to think that attachment might be more strongly associated with social cognition in relational contexts (Hill *et al.*, 2008a).

To date, no studies have tested the relation between adult attachment and social cognition assessed using a contemporary ecologically valid measure of social cognition. This thesis seeks to address this gap in the literature.

1.5.6 Social cognition, early trauma and local authority care

Many young people placed into care have experienced abuse/neglect and present with attachment difficulties. Both of these experiences are thought to impact on social cognition. In addition, care-leavers often experience difficulties regulating their emotions and maintaining interpersonal relationships (Andrew *et al.*, 2013). Both of these problems could be contributed to by impairments in social cognition (Sharp & Venta, 2012). Despite this, relatively few studies have sought to identify possible deficits in social information processing amongst young people who have experienced early trauma and/or have spent time in care.

1.5.6.1 Social cognition and early trauma

Early traumatic experiences have been shown to affect general cognitive abilities (Fishbein *et al.*, 2009) and neuroanatomical development (Oquendo *et al.*, 2013). Building upon these findings, a growing body of research is starting to elucidate the relationship between early trauma and aspects of social processing (Hassel *et al.*, 2011). Maltreated children have been shown to be more likely to interpret facial expressions as angry (Pollak *et al.*, 2000) or fearful (Leist & Dadds, 2009), they show delayed disengagement from angry faces (Pollak & Tolley-Schell, 2003) and they make more hostile attributions of peers (Price & Glad, 2003) than non-abused children. Similar findings have been observed in foster children who have experienced abuse (Masten *et al.*, 2008; Pears & Fisher, 2005).

Despite these initial findings, the literature on early trauma and social cognition is sparse (Hassel *et al.*, 2011). Two studies found that 3-8 year old children who had been abused had more difficulty passing a false belief task than their peers who had not experienced abuse (Cicchetti *et al.*, 2003; Fonagy, 2000). Similar findings have been observed in Romanian adoptees that experienced profound early deprivation (Colvert *et al.*, 2008; Tarullo *et al.*, 2007). Another study found that maltreated children in foster care have greater difficulty understanding others' emotions and

were more sensitive to anger expressions, after controlling for general cognitive ability and executive functioning (Pears & Fisher, 2005). However, it is unclear in this study to what extent the effects were attributable to the negative effects of foster care status or to maltreatment that preceded placement into care. A more recent study, utilising the Reading the Mind in the Eyes Test (Baron-Cohen *et al.*, 2001), has shown that children who have experienced abuse have more difficulty understanding the emotional state of others, especially positive emotions (Koizumi & Takagishi, 2014).

Most of these studies haven't differentiated between forms of abuse (e.g. physical, sexual, emotional abuse or neglect). Studies that have accounted for this suggest that, compared to neglect, physical abuse has a greater effect on emotional understanding of others (Pollak *et al.*, 2000) and performance on false-belief tasks (Cicchetti *et al.*, 2003). Few studies have looked at maltreatment in relation to ecologically valid measures of social cognition and the long-term effects of abuse/neglect on social cognitive style into adulthood.

1.5.6.2 Social cognition in 'looked after children' and care-leavers.

One study, discussed in the previous section, found that foster children aged 3-5 had greater difficulty understanding others' emotions and were more sensitive to anger expressions (Pears & Fisher, 2005). However, all of the foster children had experienced maltreatment before being brought into care, making it difficult to disentangle the effects of maltreatment and parental separation. It is also unclear how their findings generalise to other populations of looked after children. Another smaller study compared social cognition in two groups of foster children randomised to an Attachment and Bio-behavioural Catch-up (ABC) intervention and a group of children raised by their birth parents (Lewis-Morrarty *et al.*, 2012). They found that children in the foster group performed worse on a classical theory of mind test, which involved perspective taking, but that those who received the ABC intervention showed performance similar to non-foster children. There are two implications of this study. First, it provides evidence of social cognitive deficits in foster children. Second, it suggests that attachment-based interventions can improve social cognition – supporting the link between these two constructs. However, there were some

methodological difficulties in this study. The foster care group were younger and contained more girls than the comparison group, which is important as social cognition has been shown to differ according to age and gender (Montagne *et al.*, 2005; Wellman *et al.*, 2001). The study also utilised a measure of social cognition that measured perspective taking in relation to physical perception (e.g. the penny hiding game), which maybe does not provide insight into how individuals infer the emotional and intentional states of others.

Another study carried out in a population of adopted children focused more directly on emotional understanding, assessed through the ability to recognise emotional expression and feelings in relation to pictures of faces and children's stories (Barone & Lionetti, 2012a). This study did not include a control group, but compared data from adopted children with normative data from elsewhere. They reported a significant difference between adopted children and non-looked after children in emotional competence, with particular deficits amongst adopted children with disorganised attachment representations. These findings support early studies, indicating that looked after children are more likely to have deficits in social cognitive abilities, and suggest that this might be partially related to attachment style. However, given the small sample size, these results require replication in larger, more representative samples. Notably, no studies have investigated social cognition in adults who have spent time in care growing up. The project reported in this thesis aims to address this gap in the literature.

1.5.7 Social cognition and psychological difficulties

1.5.7.1 The relationship between social cognition and psychiatric diagnosis

In tandem with general research on social cognition, a number of studies have sought to determine the relationship between various psychological difficulties and social cognitive ability. Most of this research has been carried out within a psychiatric diagnostic framework. Deficits in various aspects of social cognition have been noted in individuals meeting diagnostic criteria for eating disorders (Skarderud, 2007a), panic disorder (Rudden *et al.*, 2008), major depressive disorder (Leppanen, 2006), schizophrenia (Savla *et al.*, 2013), bipolar disorder (Samame, 2013), personality disorders (Herpertz, 2013), substance use problems (Thoma *et al.*, 2013) and

psychosomatic conditions (Vanheule *et al.*, 2011). Some have suggested that social cognitive deficits are core-features of many severe and enduring mental health problems (e.g. Schizophrenia, Frith, 1992, Penn *et al.*, 2008). Of most relevance to this thesis is the growing body of evidence linking social cognitive deficits to psychological and emotional problems that fit diagnostic conceptualisations of psychosis and personality disorders (Fonagy & Bateman, 2008; Gunderson & Lyons-Ruth, 2008; Penn *et al.*, 2008; Roepke *et al.*, 2013; Samame, 2013) - presentations that are often characterised by exposure to early trauma (Linehan, 1993a; Varese *et al.*, 2012).

Social cognition has also been well studied amongst those diagnosed with personality disorders (Fonagy & Bateman, 2008; Gunderson & Lyons-Ruth, 2008; Roepke *et al.*, 2013). This is unsurprising given that the diagnostic criteria for many personality disorders include deficits in inferring the mental states of others (e.g. borderline personality disorder, narcissistic personality disorder; American Psychiatric Association, 1994; World Health Organisation, 1992). Paradoxically, studies of those diagnosed with borderline personality disorder (BPD) have often shown that they display 'superior' theory of mind and enhanced empathy (Dinsdale & Crespi, 2013; Fertuck *et al.*, 2009; Franzen *et al.*, 2011; Roepke *et al.*, 2013), but impaired social functioning (Gunderson, 2007). However, this might represent the insensitivity of some measures of social cognition, which have often adopted a dichotomous 'right or wrong' response format – predominantly when asking participants to identify emotional facial expression. There is a wealth of evidence that suggests that, rather than having 'deficits' in interpreting the minds of others, those meeting diagnostic criteria for personality disorders make qualitatively different inferences in relation to the mental states of others. For example, those diagnosed with borderline personality disorder tend to make more malevolent (Veen & Arntz, 2000), negative (Barnow *et al.*, 2009) and extreme (Arntz & Ten Haaf, 2012; Preisler *et al.*, 2010; Sharp *et al.*, 2013) representations of others and their intentions, which they hold with greater conviction (Schilling *et al.*, 2012a) than 'healthy controls'. They also seem to have bias towards recognising emotions as negative or hostile (Roepke *et al.*, 2013), as well as worse performance under stress (Dyck *et al.*, 2009). The latter point is important as those diagnosed with BPD characteristically have difficulties with

emotional regulation, which might interact with impaired social cognition under stress, leading to a vicious cycle that culminates in the occurrence of maladaptive coping strategies and impulsive behaviours (Fonagy & Luyten, 2009).

1.5.7.2 Social cognition and emotional regulation

Rather than focus on diagnostic categories, an alternative approach is to focus on other constitutional variables that increase vulnerability to a range of problems that prompt referrals to mental health services. Emotional dysregulation is a well-established risk factor for many psychological problems amongst children, adolescents and young people (Koenigsberg, 2010; Neumann *et al.*, 2010; Roll *et al.*, 2012). According to the mentalisation-based model of psychopathology, emotional regulation problems result from impairments in interpreting the mental states of self and others (Fonagy, 1989; Fonagy, 1991). For example, overly interpretative and negatively biased inferences in social contexts can leave individuals at risk of being overwhelmed by others' mental states (Fonagy & Luyten, 2009). As such, we might expect to observe a relationship between social cognition and emotional regulation.

Personality disorders are thought by some to be principally 'disorders of emotional regulation' (Fonagy, 1989; Linehan *et al.*, 1991). As such, studies of 'personality disorders' (described in the previous section) can partially inform our understanding of the relationship between social cognition and emotional regulation. However, relatively few studies have directly assessed the relationship between social cognition and emotional regulation. Relevant research can be drawn from the literature on Autistic Spectrum Conditions (ASC) and conduct disorder, both of which typically include prominent deficits in social cognition (Baron-Cohen *et al.*, 1985; Oliver *et al.*, 2012). For example, a recent small study found that those with ASC have more difficulties with emotional regulation than 'typically developing' individuals (Samson *et al.*, 2012). Similar findings have been found in conduct disorder (Davidson *et al.*, 2000). Another study reported that 'healthy individuals' who were more able to accurately recognise positive facial affect expressions used more adaptive emotional regulation strategies (Rowland *et al.*, 2012). However, this effect was not replicated in those meeting diagnostic criteria for schizophrenia or bipolar. This in part could have been due to the limited variation in scores observed on social cognitive measures

amongst the clinical groups, which is likely to have reduced power to detect true associations. Another study, using a more sensitive, ecologically valid measure of social cognition did find a significant correlation ($r = 0.25$) between over-interpretative mental state inference of others and emotional regulation in adolescents referred to an inpatient treatment centre (Sharp *et al.*, 2011b).

Further research is required to delineate the relationship between social cognition and emotional regulation. It has been suggested that such research should be carried out in groups likely to display variation in emotional regulation and social cognitive abilities (Schipper & Petermann, 2013). Care-leavers and adolescents from areas of relative social deprivation are at high risk of experiencing difficulties characterised by emotional dysregulation and interpersonal difficulties (Andrew *et al.*, 2013; Tarren-Sweeney, 2008). As such, they provide an appropriate group with which to study the relationship between social cognition and emotional regulation.

1.5.8 Limitations of social cognitive research

Social cognition research is not without its limitations. A common criticism is that there is a significant amount of variability in how tests have operationalised social cognitive constructs, in particular in relation to complexity, types of stimuli used (e.g. verbal, visual, static, dynamic) and dimensions of processing assessed (Samame, 2013). Several studies have utilised empirical tests, which lack ecological validity (Dziobek *et al.*, 2006a), are insufficiently challenging (Happé, 1994) and have limited divergent validity when applied to people with difficulties other than Autistic Spectrum Conditions (Sharp, 2006). More ecologically valid measures have been shown to hold more promise for reliably differentiating between individuals with and without psychological difficulties (Preisler *et al.*, 2010; Samame, 2013). There has been a recent trend toward using tasks extracted from real-life situations, such as the ‘Reading the Mind in the Eyes’ test (Baron-Cohen *et al.*, 1997; Baron-Cohen *et al.*, 2001) and video based tasks such as the ‘Awkward Moment Test’ (Heavey *et al.*, 2000) and the ‘Empathic Accuracy Paradigm’ (Roeyers *et al.*, 2001).

As described in Section 1.5.4, the ‘Movie for the Assessment of Social Cognition’ (MASC) has recently been developed (Dziobek *et al.*, 2006a). The MASC is a video-

based measure of social cognition that taps into both cognitive and emotional aspects of social cognition and allows for qualitative interpretation of social cognitive ‘errors’ (e.g. under or over-interpretative mental state inferencing). Since its development it has been used in variety of contexts to assess social cognition in relation to a broad range of ‘psychiatric diagnosis’. In the following section a systematic review was carried out to further understand the relationship between psychological difficulties and social cognition measured using the Movie for the Assessment of Social Cognition.

1.6 Systematic review

1.6.1 Review methodology

An initial review of the literature was carried out to determine whether any existing studies had investigated social cognition in care-leavers (see Appendix A for search terms). No studies were identified. As such, a systematic literature search was conducted in order to answer the following the question: “What is the relationship between social cognition, measured using Movie for the Assessment of Social Cognition, and psychological and emotional difficulties?”

On the 26th of January 2014, a review of the clinical research evidence was conducted using Web of Science, Science Direct and OvidSP (Databases: Cardiff University Full Text Journals, AMED (Allied and Complementary Medicine), Embase (up to January Week 3 2014), Ovid Medline (up to January Week 3 2014), PsycArticles Full Text and Psycinfo (up to January Week 3 2014) Given the relatively recent development of the MASC, the primary search term was “Movie for the assessment of social cognition”. All abstracts and titles identified during this process were reviewed (N = 96 after removal of duplicates). This bottom up strategy may miss articles in which the MASC was not mentioned in the title, keywords or abstracts. This was addressed by reviewing references of retrieved articles and lists of articles citing identified papers to search for additional studies. To identify in press and recently published articles, key authors were contacted and their publication records explored. The authors contacted included Isabel Dziobek, Carla Sharp, Peter Fonagy and Christiane Montag.

Studies were included if they comprised an empirical study of primary data, assessed social cognition using the MASC and explicitly tested the relationship between performance on the MASC and some facet of mental health. Reviews, editorials, discussion papers, conference abstracts and single case studies were excluded. Studies focusing on social cognition in relation to organic, neurological or developmental conditions were also excluded. Only papers available in English were reviewed. A flow chart depicting the selection process of studies included in the systematic review can be found in Figure 1.4. A total of 10 quantitative studies met the inclusion criteria. An overview of the included studies, key methodological characteristics and conclusions can be found in Table 1.1. Two studies by Sharp and colleagues published in 2011 and 2013 included overlapping data (personal communication, 17 March 2014). The latter (n=167) was an extension of the original study (n=111). However, the original study included some unique analyses that were not reported in the follow-up study, specifically, assessment of overall MASC performance and analysis of MASC scores in relation to emotional regulation. As these analyses are relevant to this thesis they will be included in this review. However, results for overlapping analyses will be taken from the more recent, larger study by Sharp *et al.* (2013) (e.g. correlation between hypermentalising and ‘borderline traits’). A more detailed narrative review of the identified studies can be found in the following sections.

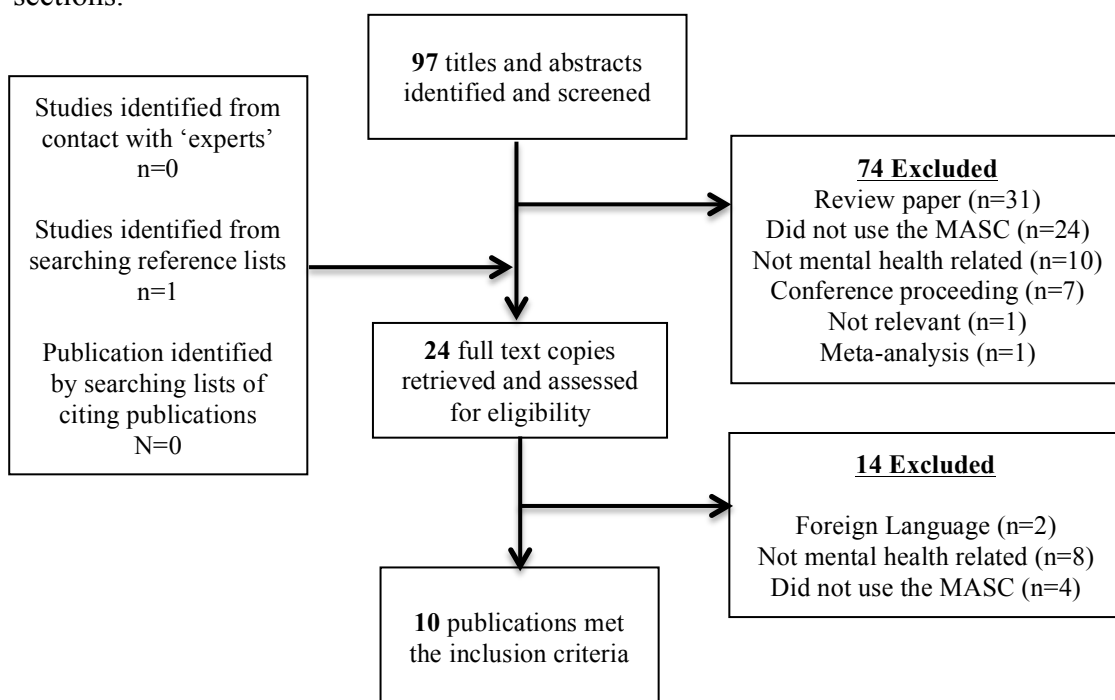


Figure 1.4 Flow chart of the systematic review study selection process.

Table 1.1. Summary of observational studies that have investigated social cognition, using the Movie for the Assessment of Social Cognition, in relation to psychological functioning.

Study	Sample			Method	Additional Measures ^b	Confounding variables	Mean MASC score (SD)	Mean hyper-mentalising errors (SD)	Key Findings ^d	Key Limitations
	<i>n</i>	Gender, % female	Mean Age (SD), years							
Studies of 'borderline traits'										
Preissler <i>et al.</i> (2010)	64 Inpatients diagnosed with BPD (n=64; 22 with comorbid PTSD) Age, sex and IQ matched controls (n=38)	BPD: 100 Control: 100	BPD: 29.2 (8.9) Control: 31.7 (10.3)	<u>Patient recruitment:</u> Consecutive admissions. <u>Design:</u> Case-control <u>Data Analysis:</u> MANOVA and ANOVA	<u>Social Cognition:</u> RMET <u>Other:</u> Fluid IQ, BSL, PTSD Diagnostic Scale	<u>Groups matched for:</u> Age, Sex, IQ <u>Statistically controlled:</u> None	BPD Full: 29.9 (7.8) BPD-PTSD: 31.3 (6.8) BPD+PTSD: 27.2 (9.1) Control: 35.6 (3.9)	Not reported	<u>BPD:</u> 1) Deficits in MASC sum score and thoughts, emotions and intentions subscales, more pronounced in those with comorbid PTSD. <u>Correlations:</u> 1) Lower MASC sum score associated with higher BSL intrusions score, comorbid PTSD and sexual assault by known assailant. 2) No associations between MASC variables and other BSL domains, major depression, substance abuse, eating disorders or other PD.	1) Limited to females. 2) MASC error analysis not reported. 3) Unclear whether IQ was matched in PTSD and non-PTSD groups. 4) Unclear if any participants were excluded or refused consent. 5) Relied on self-report of past trauma. 6) Wide inclusion criteria could introduce bias.
Ritter <i>et al.</i> (2011)	Inpatients diagnosed with NPD (n=47; 25 with comorbid BPD) Inpatients diagnosed with BPD without NPD (n=27). Age matched controls n=53)	NPD: 51.0 BPD: 92.6 Control: 54.7	NPD: 32.4 (8.0) BPD: 30.0 (8.3) Control: 33.2 (10.7)	<u>Patient recruitment^a:</u> Sampling strategy not described. <u>Design:</u> Case-control <u>Data Analysis:</u> MANOVA and ANCOVA	<u>Social Cognition:</u> IRI, MET <u>Other:</u> SCL-90-R, Fluid IQ; Structured Interview for DSM-IV for PD	<u>Groups matched for:</u> Age <u>Statistically controlled:</u> Gender	NPD: 30.8 (4.9) NPD-BPD: 31.1 (5.1) BPD-NPD: 29.8 (8.2) Control: 33.3 (5.3)	Not reported	<u>BPD only group:</u> Deficits on MASC sum score, especially recognising intentions. <u>NPD:</u> Deficits in MASC performance observed, but not significant after excluding those with comorbid BPD.	1) Control group not matched for IQ and not controlled for statistically. 2) Small BPD-only and NPD-only groups. 3) High proportion of medication use not controlled for. 4) MASC error analysis not reported. 5) Wide inclusion criteria could introduce bias.

Table 1.1. Continued.

Study	Sample			Method	Additional Measures ^b	Confounding variables	Mean MASC score (SD)	Mean hypermentalising errors (SD)	Key Findings ^d	Key Limitations
	<i>n</i>	Gender, % female	Mean Age (SD), years							
Sharp <i>et al.</i> (2011)	Inpatients at a private adolescent treatment program (n=111; 24 diagnosed with BPD)	55.9	15.5 (1.4)	<p><u>Recruitment:</u> Consecutive admissions (21 patients excluded).</p> <p><u>Design:</u> Correlational</p> <p><u>Data Analysis:</u> Multivariate Regression Analyses, mediation analysis.</p>	<p><u>Social Cognition:</u> None</p> <p><u>Other:</u> DISC, BPFSC, DERS, Childhood Interview for DSM-IV BPD, Youth Self-Report, Antisocial Process Screening Device.</p>	<p><u>Statistically controlled:</u> Internalizing and externalizing problems, age, gender.</p>	Total: 31.8 (5.5)	<p>Total Sample: 8.1 (4.1)</p> <p>BPD: 10.1 (5.5)</p> <p>Not BPD: 7.45 (3.4)</p>	<p>* NB: this study was extended by Sharp <i>et al.</i> (2013). Therefore, only analyses unique to this study are reported.</p> <p><u>Correlations:</u> 1) Negative correlation between borderline traits and MASC sum score 2) Hypermentalising significantly correlated with 'borderline traits'. 3) Hypermentalising correlated with DERS</p> <p><u>Mediation analysis:</u> DERS partially mediated the relationship between hypermentalising and borderline trait scores.</p>	<ol style="list-style-type: none"> 1) BPD Diagnoses relied on adolescent self-report. 2) Analysis of MASC intentions, emotions and cognitive modalities not reported. 3) Analysis of BPD subgroups limited to hypermentalising. 3) Lack of control data. 4) Effects of medication not reported. 5) Did not control for IQ 6) Wide inclusion criteria could introduce bias.
Sharp <i>et al.</i> (2013)	Inpatients at a private adolescent treatment program (n=167; 67 diagnosed with BPD)	61.6	16.0 (1.4)	<p><u>Recruitment:</u> Consecutive admissions (40 patients excluded, 53 lost to follow up)</p> <p><u>Design:</u> Correlational, Case control, pre-post longitudinal</p> <p><u>Data Analysis:</u> Correlations, T-test, Repeated measures ANOVA</p>	<p><u>Social Cognition:</u> RMET, MSTA, BES</p> <p><u>Other:</u> BPFSC, Childhood Interview for DSM-IV BPD, Youth Self-Report.</p>	<p><u>Groups matched for:</u> Age</p> <p><u>Statistically controlled:</u> None</p>	Not reported	<p><u>At admission</u> BPD: 8.8 (4.4) Not-BPD: 7.4 (3.6)</p> <p><u>At discharge</u> BPD: 5.9 (3.1) Not-BPD: 5.7 (2.7)</p>	<p><u>BPD:</u> 1) Elevated hypermentalising at admission, but not discharge. 2) Hypermentalising not associated with CDISC mood, anxiety or externalising disorders at admission or discharge.</p> <p><u>Correlations:</u> Hypermentalising at admission positively correlated with 'borderline traits'.</p> <p><u>Pre-post:</u> 1) Hypermentalising reduced between admission and discharge, more so in BPD group. 2) Pre-post change in hypermentalising score correlated with change in BPFSC score.</p>	<ol style="list-style-type: none"> 1) Lack of control group (e.g. waitlist or TAU). 2) Did not control for IQ or non-social inferencing, or time between admission and discharge. 3) Moderate rate of attrition. 4) Effects of medication not reported. 5) Higher % of females in BPD group. 6) Analysis of MASC intentions, emotions and cognitive modalities not reported. 7) Wide inclusion criteria could introduce bias.

Table 1.1. Continued.

Study	Sample			Method	Additional Measures ^b	Confounding variables	Mean MASC score (SD)	Mean hyper-mentalising errors (SD)	Key Findings ^d	Key Limitations
	<i>n</i>	Gender, % female	Mean Age (SD), years							
Studies of mood related problems										
Wilbertz <i>et al.</i> (2010)	In and Outpatients with chronic depression (n=16) Age, sex, IQ, occupation and education matched controls (n=16)	Depression: 50.0 Control: 50.0	Depression: 44.4 (11.4) Control: 43.1 (11.1)	<u>Recruitment^a</u> : Sampling strategy not described. <u>Design</u> : Case-control <u>Data Analysis</u> : T-Test, ANOVA.	<u>Social Cognition</u> : IRI, Empathy Scale <u>Other</u> : State-trait Anxiety Inventory, CTQ, Hopelessness scale, Fluid IQ, Regensburg word fluency test, Vocabulary test.	<u>Groups matched for</u> : Age, Sex, IQ <u>Statistically controlled</u> : MASC control condition, age and AVLT.	Depression: 32.4 (5.8) Control: 32.4 (5.2)	Not reported	<u>Depression</u> : No difference between groups on the MASC sum score, or subscales for intentions, emotions and thoughts.	1) Small sample size. 2) Unclear how representative the control group was in terms of BDI, degree of trauma and relatively low mean MASC sum score. 3) MASC error analysis not reported. 4) Use of rigid inclusion reduces generalisability to other populations.
Wolkenstein <i>et al.</i> (2011)	Outpatients with depressive disorders (n=24) Age, sex and education matched controls (n=20)	Depression: 54.1 Control: 60.0	Depression: 37.2 (10.4) Control: 35.7 (11.2)	<u>Recruitment^a</u> : Sampling strategy not described. <u>Design</u> : Case-control <u>Data Analysis</u> : MANOVA, Correlations	<u>Social Cognition</u> : RMET <u>Other</u> : Quick Inventory of Depressive Symptoms, Trail Making Test, AVLT, Word Fluency Test, WCST.	<u>Groups matched for</u> : Age, Sex, Education <u>Statistically controlled</u> : None	Depression: 32.9 (4.8) Control: 35.9 (4.5)	Depression: 4.9 (3.9) Control: 4.2 (2.7)	<u>Depression</u> : 1) Deficits on MASC sum score. 2) Elevated undermentalising errors, but not hypermentalising or lack of mentalising errors. 3) MASC scores not correlated with continuous measure of depressive symptomology.	1) Minor difference in general cognition and control groups not controlled for in analyses. 2) Small sample size. 3) High average IQ of groups not generalisable to wider population. 4) Use of rigid inclusion criteria reduces generalisability to other populations. 5) Effects of medication not reported.
Montag <i>et al.</i> (2010)	Outpatients with BPAD (n=29) Age and sex matched controls (n=29)	BPAD: 65.5 Control: 55.2	BPAD: 44.0 (12.9) Control: 39.7 (10.9)	<u>Recruitment^a</u> : Sampling strategy not described. <u>Design</u> : Case-control <u>Data Analysis</u> : MANOVA, Correlations.	<u>Social Cognition</u> : None <u>Other</u> : Vocabulary test, AVLT, Hamilton Depression Scale, Young Mania Rating Scale	<u>Groups matched for</u> : Age, Sex <u>Statistically controlled</u> : MASC control condition, age and AVLT.	BPAD: 30.7 (5.4) Control: 34.6 (3.7)	Not reported	<u>BPAD group</u> : 1) Deficits in cognitive, but not emotional mental state reasoning. 2) Elevated 'undermentalising', but not 'overmentalising' 3) Number of manic phases correlated negatively with and MASC 'emotional' mental state sub score and positively with 'undermentalising' (did not survive correction for multiple testing).	1) All BPAD group were medicated. 2) Use of rigid inclusion criteria reduces generalisability to other populations

Table 1.1. Continued.

Study	Sample			Method	Additional Measures ^b	Confounding variables	Mean MASC score (SD)	Mean hypermentalising errors (SD)	Key Findings ^d	Key Limitations
	<i>n</i>	Gender, % female	Mean Age (SD), years							
Studies of Miscellaneous problems										
Montag <i>et al.</i> (2011)	In and Outpatients with PSZ (n=80) Age, gender and verbal intelligence matched controls (n=80)	PSZ: 41.3 Control: 48.8	PSZ: 39.1 (10.7) Control: 38.4 (12.3)	<u>Recruitment</u> ^a : Sampling strategy not described <u>Design</u> : Case-control <u>Data Analysis</u> : MANCOVA	<u>Social Cognition</u> : None <u>Other</u> : Vocabulary test, AVLT, PANSS.	<u>Groups matched for</u> : Age, Sex, Verbal intelligence <u>Statistically controlled</u> : Non-social inferencing, AVLT (verbal memory), age and gender.	PSZ: 25.0 (7.9) Control: 34.1 (3.7)	PSZ: 6.1 (3.7) Control: 4.6 (2.2)	<u>PSZ</u> : 1) Deficits on MASC sum score, cognitive and emotional sub scores. 2) More errors across all error categories. <u>Correlations</u> : Positive relationship between hypermentalising (but not undermentalising) error and PANSS positive and delusion sub scores. Positive relationship between lack of mentalising and PANSS negative scale (did not survive correction for multiple testing)	1) High rate of psychoactive medication use in PSZ group (although medication use was not association with MASC scores). 2) Healthy participants not screened for schizotypal traits and delusion proneness. 3) Use of rigid inclusion criteria reduces generalisability to other populations
Preller <i>et al.</i> (2013)	Dependent cocaine users (DCU; n=31) Recreational cocaine users (RCU; n=69) Sex and IQ matched stimulant-naïve controls (n=68)	DCU: 22.6 RCU: 29.0 Control: 30.9	DCU: 34.8 (10.2) RCU: 28.1 (6.6) Control: 29.8 (9.1)	<u>Recruitment</u> ^a : Advertisement. <u>Design</u> : Case-control <u>Data Analysis</u> : ANOVA and MANOVA	<u>Social Cognition</u> : RMET, MET <u>Other</u> : Vocabulary test, BDI, ADHD self-rating scale, Social Network Questionnaire.	<u>Groups matched for</u> : Sex and IQ <u>Statistically controlled</u> : Age and years of education	DCU: 31.2 (4.3) RCU: 33.7 (4.0) Controls: 33.9 (4.0)	DCU: 6.8 (3.2) RCU: 5.4 (2.6) Controls: 5.4 (2.4) ^c	<u>DCU</u> : 1) Deficits on MASC sum score compared to controls 2) higher rate of hypermentalising responses compared to RCU and control. <u>Correlations</u> : MASC sum score correlated with BDI in the combined sample and ADHD in cocaine users, but not Anti social and Narcissistic PD.	1) Significant difference between groups for nicotine dependence, Antisocial & Narcissistic PD, (although these had little effect on results when controlled for as covariates), ADHD self-rating scale and BDI. 2) Effects of medication not reported. 3) Analysis of MASC intentions, emotions and thoughts cognitive modalities not presented.
Schönenberg <i>et al.</i> (2014)	Inpatients with persistent somatoform pain disorder (PSPD; n=19); Sex and age matched controls (n=19)	PSPD: 100 Control: 100	PSPD: 47.1 (8.9) Control: 46.2 (10.1)	<u>Recruitment</u> ^a : Inpatients. Sampling strategy not described <u>Design</u> : Case-control <u>Data Analysis</u> : ANOVA and t-tests	<u>Social Cognition</u> : Facial affect perception <u>Other</u> : TAS-20	<u>Groups matched for</u> : Sex, years of education and age <u>Statistically controlled</u> : None	PSPD: 29.5 (7.3) Controls: 34.6 (4.0)	PSPD: 6.7 (3.6) Controls: 3.8 (2.3)	<u>PSPD</u> : 1) Deficits in MASC sum score and emotional mental state reasoning compared to controls 2) higher rate of hypermentalising responses compared to controls 3) Trend toward high rate of undermentalising Responses compared to controls (p=0.13). <u>Correlations</u> : Alexithymia strongly associated with hypermentalising in PSPD group but not controls.	1) Small sample size 2) Effects of medication not reported 3) Controlled for years in education but not 'general cognition'. 4) Sampling strategy not reported. 5) Did not screen for other psychological and emotional problems

ADHD=Attention Deficit and Hyperactivity Disorder; **AVLT**=Auditory Verbal Learning Test; **BDI**= Beck Depression Inventory; **BES**=Basic Empathy Scale; **BSL**= Borderline Symptoms List; **BPAD**=Bipolar affective disorder; **BPD**=Borderline Personality Disorder; **BPFSC**=Borderline Personality Features Scale for Children; **CTQ**=Childhood Trauma Questionnaire; **DEERS**= Difficulties with Emotional Regulation Scale; **DISC**=Diagnostic Interview Schedule for Children; **DCU**=Dependent cocaine user; **IRI**=Interpersonal Reactivity index; **MASC**=Movie for the Assessment of Social Cognition; **MSTA**=Mentalising Stories Test for Adolescents; **NPD**=Narcissistic personality disorder; **PANSS**= Positive and Negative Syndrome Scale; **PD**=Personality disorder; **PSPD**=Persistent Somatoform Pain Disorder; **PSZ**=Paranoid Schizophrenia; **PTSD**=Post-traumatic stress disorder; **RCU**=Recreational cocaine user; **RMET**=Reading the Mind in the Eyes test; **SCL**=Symptom Check List; **SD**=Standard Deviation; **TAS-20**=Toronto Alexythymia Scale-20; **TAU**=Treatment as usual; **WCST**=Wisconsin Card Sort Test.

^a Controls recruited through local or media advertising unless otherwise stated. ^b All studies utilised the Movies for the Assessment of Social Cognition ^c Summary data obtained from M Preller (personal communication, August 30, 2013). ^d All effects reported to be significant ($p < 0.05$) after correction for multiple testing unless otherwise stated.

1.6.2 *Samples and populations*

The ten studies represented groups with a range of clinical problems. Seven studies focused on discrete psychiatric diagnoses, including: Borderline Personality Disorder (BPD; Preisler *et al.*, 2010), BPD and/or Narcissistic Personality Disorder (NPD; Ritter *et al.*, 2011), bipolar affective disorder (Montag *et al.*, 2010), paranoid schizophrenia (Montag *et al.*, 2011), depressive conditions (Wilbertz *et al.*, 2010; Wolkenstein *et al.*, 2011), persistent somatoform pain disorder (Schönenberg *et al.*, 2014) and cocaine dependence (Preller *et al.*, 2013). Half of these studies (N=5) employed screening implements to exclude individuals with substance misuse disorders, as well as other axis-I or axis-II psychiatric diagnoses (e.g. Structured Clinical Interview for DSM-IV I and II, First *et al.*, 1995; First *et al.*, 1997; Mini International Neuropsychiatric Interview, Sheehan *et al.*, 1998). Whilst this approach minimises bias caused by comorbid clinical problems, it also reduces the generalisability as multiple comorbid psychiatric diagnoses are common in clinical populations (Kessler *et al.*, 2005) especially among young people who have spent time in care (Ford *et al.*, 2007). The studies by Preisler *et al.* (2010) and Ritter *et al.* (2010) limited their exclusions to those with a past history of ‘psychotic disorder’ and reported levels of diagnostic comorbidity that were comparable to those found in routine clinical settings (Grant *et al.*, 2008). Rather than utilising diagnostic categories, the overlapping studies by Sharp and colleagues focused on quantitatively measured ‘borderline traits’ (Sharp *et al.*, 2013; Sharp *et al.*, 2011b).

Most of the studies (N=8) focused on adult populations with the mean age of participants ranging from 28.0 to 47.1 years. The overlapping studies by Sharp and colleagues recruited adolescents (12-17 years olds, mean age 16.0 years). Gender is an important factor in studies of social cognition as males and females have traditionally been shown to interpret social information differently (Baron-Cohen *et al.*, 2005; Brackett *et al.*, 2004; Focquaert *et al.*, 2007; Montagne *et al.*, 2005). Most studies used mixed gender samples (N=8). The studies by Preisler *et al.* (2010) and Schönenberg *et al.* (2014) utilised all female samples. The justification for this was not specified but most likely reflects the clinical service in which the study was carried out. The seven ‘case-control’ studies used gender-matched samples or controlled for the confounding effects of sex in MASC analyses.

1.6.3 Design and recruitment

Nine studies were cross-sectional. Those that focused on discrete psychiatric diagnoses all adopted a case-control methodology (N=8). The two studies by Sharp and colleagues used a correlational design, focusing on the relationship between MASC scores and quantitative measures of ‘borderline traits’ (Sharp *et al.*, 2013; Sharp *et al.*, 2011b). The more recent of these studies also included a longitudinal component to determine whether there was a reduction in hypermentalising between admission and discharge to an adolescent inpatient treatment programme, and whether this differed between adolescents who met the diagnostic criteria for BPD and those who did not. The reliance on cross-sectional methodology limits the conclusions that can be drawn about the causal relation between social cognition and mental health problems.

All but one study (Preller *et al.*, 2013) recruited participants from clinical settings. Five studies recruited their clinical samples exclusively through inpatient settings (Preisler *et al.*, 2010; Ritter *et al.*, 2011; Schönenberg *et al.*, 2014; Sharp *et al.*, 2013; Sharp *et al.*, 2011b), two included a combination of participants known to inpatient and/or outpatient services (Montag *et al.*, 2011; Wilbertz *et al.*, 2010) and two recruited from clinical outpatient populations (Montag *et al.*, 2010; Wolkenstein *et al.*, 2011). The study by Preller *et al.* (2013) recruited via advertising – which included adverts in drug prevention and treatment centres and psychiatric hospitals. As such, it is likely that some of their sample were in touch with addiction or mental health services.

Three studies utilised systematic sampling technique (Preisler *et al.*, 2010; Sharp *et al.*, 2013; Sharp *et al.*, 2011b). Specifically they sought to recruit consecutive admissions. The studies by Sharp and colleagues recruited over 84% of their target population, which gives us some confidence that their results are representative of the relevant inpatient settings (Fincham, 2008). Preisler and colleagues (2010) did not report the number of participants who refused consent or who were excluded. The remaining studies (N=7) used convenience sampling to recruit their clinical samples and failed to comment on the generalisability to the broader population. All studies that included ‘healthy individuals’ recruited them through media advertising, which is

likely to have introduced bias as those who respond to adverts are known to be different to non-responders across a range of variables (Dunne *et al.*, 1997).

1.6.4 *Sample size*

It is important to consider sample size and statistical power when evaluating the validity and reliability of observational studies. Sample sizes across the included studies varied considerably (see Table 1.1). It is notably that the smallest study was the only one that did not identify a significant relationship between MASC performance and the outcome of interest (depression; Wilbertz *et al.*, 2010). The only other study specifically focusing on depression had a slightly larger sample, which while still small, identified deficits in MASC performance when comparing depressed individuals with controls (Wolkenstein *et al.*, 2011).

The two overlapping studies by Sharp and Colleagues (2011b; 2013), which focused on traits, rather than diagnosis, were both relatively large – comprising 111 and 164 patients respectively. The power in these studies is also bolstered by the correlational design. Where the true latent variation is continuous, (as is the case with social cognition, personality traits and most likely mental health ‘disorders’, Division of Clinical Psychology, 2010; Jones & Bentall, 2006), analysis of quantitative traits offers more statistical power than analysis of dichotomous variables (Van Der Sluis *et al.*, 2013).

1.6.5 *Treatment of confounding variables*

Most studies attempted to limit the confounding effects of gender and age as already discussed. Two other variables that were commonly addressed were general cognition and medication use, which were accounted for either statistically in multivariate analyses or by matching case and control samples. A number of studies included neuropsychological tests to control for the effects of general cognition. In three studies IQ did not differ according to ‘case–control’ status (Preisler *et al.*, 2010; Preller *et al.*, 2013; Wilbertz *et al.*, 2010). However, four studies included clinical groups that performed worse on neuropsychological tests than ‘healthy controls’ (Montag *et al.*, 2011; Montag *et al.*, 2010; Ritter *et al.*, 2011; Wolkenstein *et al.*, 2011). One of these studies failed to account for intelligence in any subsequent analyses (Ritter *et al.*, 2011), which could mean that differences in social cognition

identified may be attributable to non-specific deficits in cognition. A similar criticism could be made of the studies by Schönenberg *et al.* (2014), Sharp *et al.* (2011b) and Sharp *et al.* (2013), which did not include a measure of general cognition. However in these studies clinical variables were associated with overly interpretive mental state inferencing, but not reduced or absent mental state inferences – which is perhaps not what might be expected if the deficits were solely attributable to general cognition. In addition, those who have tested the relationship between general cognition and MASC performance have generally found that they are independent (Dziobek *et al.*, 2006a; Preisler *et al.*, 2010; Wolkenstein *et al.*, 2011).

The impact of medication on general and social cognition is controversial (Kucharska-Pietura & Mortimer, 2013; Sergi *et al.*, 2007). However, many medications purport to alleviate psychological distress by increasing sedation and/or bringing about cognitive alternations (or have similar side effects) – which could directly or indirectly affect performance on measures of social cognition. Five studies explicitly reported the number of participants taking various categories of medications (e.g. anti-depressants, benzodiazepines, anti-psychotics and/or antiepileptic drugs). Of these, three included clinical samples in which a relatively low proportion of participants were taking psychoactive medications (<50%; Preisler *et al.*, 2010; Ritter *et al.*, 2011; Wilbertz *et al.*, 2010). In contrast, the majority of participants (>90%) in the studies by Montag *et al.* (2010) and Montag *et al.* (2011) were taking some form of medication – which probably reflects the nature of the client groups in these two studies (e.g. those diagnosed with severe and enduring mental health problems). Four studies did not comment on the use of psychoactive medication in their studies (Preller *et al.*, 2013; Schönenberg *et al.*, 2014; Sharp *et al.*, 2013; Sharp *et al.*, 2011b), whereas Wolkenstein *et al.* (2011) included those on ‘stable doses of antidepressants’ – but did not report figures. The failure to account for the effects of medication is a general weakness of most research studies that have used the MASC. However, two studies reported the relationship between medication use and MASC performance – finding no association (Montag *et al.*, 2011; Preisler *et al.*, 2010).

1.6.6 Review of the data-analytic approach to the outcome variable

As defined by the review criteria all studies utilised the MASC. The MASC total score is calculated by summing the total number of ‘correct’ answers and represents a

broad index of social cognition. Secondary analyses can be carried out according to 1) *mental state modalities*, which focuses on items requiring participants to interpret either emotions, intentions or thoughts; 2) *error categories*, which allows differentiation of three different types of mistakes that reflect hypermentalising, undermentalising response and lack of mentalising (see Section 2.4.1 for a more detailed explanation). These sub-scores tap into different facets of social cognition and ask different questions of the data. Whilst all studies have reported analysis of MASC total scores, they have differed in their use of MASC sub-scores (see Table 1.1). This is important because failure to fully dissect performance on the task might mask subtle differences between clinical groups. For example, Sharp and colleagues found that hypermentalising correlated more strongly with ‘borderline traits’ than total MASC score (Sharp *et al.*, 2011b). However, the other two studies that focused on individuals meeting diagnostic criteria for borderline personality disorders did not perform analysis of error categories, potentially missing important relationships between variables (Preisler *et al.*, 2010; Ritter *et al.*, 2011).

Several studies (N=7) incorporated other measures of social cognition. The most commonly used were measures of empathy (e.g. the Basic Empathy Scale, Jolliffe & Farrington, 2006; Multifaceted Empathy Test, Dziobek *et al.*, 2008; The Empathy Scale, Vierzigmann, 1995; and the Interpersonal Reactivity Index, Davis, 1980) and the Reading the Mind in the Eyes test (RMET; Baron-Cohen *et al.*, 2001), which measures explicitly controlled and external forms of social cognition. Inclusion of other measures of social cognition has two benefits. First, it allows the issue of domain specificity in social cognition performance to be addressed. Second, it improves the convergent validity of the findings where measures analogous to the MASC are utilised.

1.6.7 *Review of the study findings*

The identified studies include those with problems often diagnosed as ‘personality disorders’ (BPD and narcissistic personality disorder), persistent somatoform pain disorder, mood difficulties, psychosis, and substance abuse. These broad themes will provide the structure for this review. As described, four studies focused on ‘borderline traits’ and individuals meeting diagnostic criteria for BPD. Two of these reported that those in their ‘BPD groups’ performed worse *overall* on the MASC compared to

‘healthy controls’ (Preller *et al.*, 2013; Ritter *et al.*, 2011). Another reported a negative correlation between overall MASC performance and ‘borderline traits’ in an adolescent inpatient population (Sharp *et al.*, 2011b). Analysis of overall MASC performance was not reported in the extension to this study (Sharp *et al.*, 2013). Instead the authors focused on the *type of errors* made on the MASC. They found that ‘borderline traits’ and BPD diagnosis were associated with hypermentalising responses, but not undermentalising and lack of mentalising responses. Interestingly, ‘borderline traits’ seem to be more strongly associated with ‘hypermentalising responses’ than with overall performance on the MASC ($r=0.41$, $r=0.22$ respectively in the study by Sharp *et al.*, 2011). This implies that those with difficulties often diagnosed as BPD perform worse overall on the MASC, largely due to a tendency to make overly complex inferences based on social cues. It also underscores the utility of analysing the types of errors made on the MASC. Unfortunately, the other two studies that focused on ‘personality disorders’ did not report error analysis (Preisler *et al.*, 2010; Ritter *et al.*, 2011). However, they did report analysis of mentalisation across the various modalities assessed by the MASC (thoughts, emotions and intentions of others). Preissler *et al.* reported that those in the BPD group performed worse across all three modalities compared to controls, but noted a more pronounced deficit in correctly inferring the intentions of others. This was consistent with the finding of Ritter *et al.* (2011) – who reported that deficits in social cognition in their ‘BPD group’ were limited to the intentions modality.

The study by Preissler *et al.* (2010) expanded the focus on BPD to separately analyse social cognition in those with BPD and various indicators of trauma. They found that MASC scores across all modalities in those diagnosed with BPD were further impaired amongst those presenting with comorbid PTSD, intrusive symptoms and those who reported sexual assault by a known assailant. This is consistent with the known relationship between trauma and difficulties often diagnosed as BPD (Ball & Links, 2009; Bandelow *et al.*, 2005) and guides future hypotheses about the aetiology of social cognitive deficits in this population.

A wealth of cross sectional and developmental research has demonstrated a strong link between emotional regulation and ‘borderline traits’ (Linehan, 1993a). One study

has used mediation analysis to investigate whether hypermentalising on the MASC and difficulties with emotion regulation are alternate or linked aspects of vulnerability to ‘borderline traits’ (Sharp *et al.*, 2011b). Firstly, they reported a significant correlation between hypermentalising and emotional regulation ($r=0.27$). They also found that difficulties in emotional regulation partly mediate the association between hypermentalising and ‘borderline traits’. This is consistent with the mentalisation model of psychopathology, which hypothesises that hypermentalising leads to difficulties in emotional regulation, which in turn leads to the emergence of symptoms characteristic of BPD (Fonagy, 1991).

There appears to be specificity to these findings. Ritter *et al.* (2010) found that deficits in social cognition were largely limited to those meeting diagnostic criteria for BPD – but not ‘Narcissistic Personality Disorder’. Similarly, whilst noting a strong relationship between hypermentalising and BPD traits, Sharp *et al.*, 2013 did not observe any relationships with other clinical problems (e.g. mood, anxiety and conduct problems). Furthermore, (Sharp *et al.*, 2013) found that change in hypermentalising score between admission and discharge to an inpatient treatment facility also correlated strongly with changes in ‘borderline traits’ ($r=-.25$). The co-variation of hypermentalising and ‘borderline traits’ over time increases our confidence that these variables are directly linked.

Taken together these studies provide evidence that social cognition is impaired in those meeting diagnostic criteria for BPD and those displaying ‘borderline traits’. There is evidence that these deficits are largely due to a tendency to make overly complex inferences based on social cues, especially when attempting to understand the intentions of others. This is perhaps unsurprising as the difficulties underpinning this diagnosis largely involve unstable interpersonal relationships (American Psychiatric Association, 1994). Deficits in correctly identifying emotions, thoughts and intentions of others could lead to difficulties in interpersonal relationships (Preisler *et al.*, 2010). However, further studies are required to assess the cognitive and behavioural impacts of impaired social cognition.

Two studies have investigated social cognition using the MASC in individuals diagnosed with depression (Wilbertz *et al.*, 2010; Wolkenstein *et al.*, 2011) and another in relation to ‘bipolar affective disorder’ (BPAD), of which affective difficulties are a key component (American Psychiatric Association, 1994). The study by Wilbertz *et al.* (2010) utilised an extreme subpopulation of individuals with chronic early onset depression and did not identify any differences in MASC scores between depressed individuals and ‘healthy controls’. This could indicate that social cognition is not associated with low mood. Alternatively it could represent methodological difficulties in this study. First, it is unclear how representative the control group was, particularly as the control group in this study reported high levels of trauma and cognitive deficits, as well as relatively poor performance on the MASC compared to control groups in other studies (see Table 1.1). Second, it could reflect the limited power in this study, which was limited to 32 participants. Third, the authors failed to report error analysis of the MASC, which means that subtle associations with specific social cognitive deficits may have been missed. Theoretical models suggest that those with chronic depression may have a tendency to ‘undermentalise’ (e.g. make insufficient mental state inferences, McCullough, 2000). Indeed, this is what was found in the other study to focus specifically on low mood (Wolkenstein *et al.*, 2011). The authors of this study reported that outpatients diagnosed with depression scored worse overall on the MASC compared to ‘healthy controls’. This was largely due to a tendency to make insufficient inferences based on social cues (e.g. undermentalising). In their study differences were not specific to *social* cognition, as individuals presenting with depression also had small, but significant, deficits in general cognition. Unlike Wolkenstein *et al.* (2011), Montag *et al.* (2011) controlled for the confounding effects of general cognition and reported similar findings: those diagnosed with bipolar affective disorder were more likely to make ‘undermentalising errors’ than ‘healthy controls’.

Other studies have focused on mood as a secondary variable within studies of other clinical problems. The findings have been inconsistent. For example, Preller *et al.* (2013) found a significant negative correlation between overall MASC performance and scores on the Beck Depression Inventory (BDI; Beck *et al.*, 1961) and Montag *et al.* (2011) reported a non-significant trend level correlation between lack of

mentalising responses and ‘negative symptoms’ on the Positive and Negative Syndrome Scale (PANSS; Kay *et al.*, 1987). However, the studies by Sharp *et al.*, 2013 and Preissler *et al.* (2010) did not identify differences in MASC performance when comparing those in their sample who did and did not meet research criteria for mood disorders.

Taken together these studies provide some evidence that social cognition may be associated with depression and low mood. In contrast to those with ‘borderline traits’, those with depression appear more likely to make reduced (rather than overly complex) mental state inferences. However, inconsistencies and methodological limitations in the available studies make it difficult to draw any firm conclusions.

Only one study has focused on clinical problems that fall under the umbrella of psychosis. Montag *et al.* (2011) recruited a large sample of individuals meeting diagnostic criteria for paranoid schizophrenia (PSZ). They reported that those in the ‘PSZ group’ showed significant deficits across all modalities assessed by the MASC (cognitive, emotional and intentions) and made significantly more mistakes across all error types (hypermentalising, undermentalising and lack of mentalising) compared to ‘healthy controls’. Interestingly, those in the PSZ group recorded the lowest overall mean MASC score of any sub-group assessed in the other eight studies (see Table 1.1). Strong relationships were observed between ‘hypermentalising’ and PANSS positive ($r=0.38$) and delusions subscales ($r=0.37$), but not the PANSS negative subscale – which showed a trend level association with ‘undermentalising’. These findings support conceptualisations of severe and enduring mental health difficulties, which suggest that ‘overmentalising’ occurs in the context of ‘paranoid states’ and undermentalising in the context of ‘negative symptoms’ (Frith, 2004).

Another study sought to investigate the relationship between social cognition and empathy in cocaine users. In their well-powered study, Preller *et al.* (2013) reported that ‘dependent cocaine users’ performed worse overall than ‘healthy controls’ on the MASC and that impaired social cognition correlated with higher cocaine intake. Error analysis revealed that this deficit was largely due to dependent cocaine users making significantly more ‘hypermentalising’ responses than both ‘recreational cocaine users’

and ‘controls’. Interestingly, performance on the MASC showed a significant (but weak) negative correlation with ‘social network size’ - indicating that impaired social cognition goes along with worse real-life social functioning.

The most recent study compared social cognition in a relative small sample of females diagnosed with persistent somatoform pain disorder (PSPD) and ‘healthy adults’ (Schönenberg *et al.*, 2014). They found that individuals diagnosed with PSPD performed worse overall on the MASC when compared to controls. Specifically, they showed more difficulty with emotional mental state decoding and were significantly more likely to make ‘hypermentalising’ responses. In this study, deficits in social cognition were specific to the high-level social cognitive demands assessed using the MASC. No differences were observed between the PSPD group and controls on a lower-level emotional facial expression recognition task. Interestingly, difficulties in emotional regulation and alexithymia are thought to partially account for PSPD (Waller & Scheidt, 2006). Schönenberg *et al.*, 2014 did not test for a relationship with emotional regulation but did find a strong relationship between emotional self-awareness (e.g. alexithymia) and hypermentalising ($r=0.72$).

1.6.8 Summary

In summary, there is evidence that a broad range of mental health problems are associated with impairments on an ecologically valid measure of social cognition. Deficits seem most pronounced in those with severe and enduring psychological problems (e.g. personality disorders and psychosis). Interestingly, consistent evidence has been found for social cognitive deficits, as measured by the MASC, in populations with psychological difficulties linked to emotional regulation. For example, borderline personality disorder is thought by some to be principally a ‘disorder of emotional regulation’ (Fonagy, 1989; Linehan *et al.*, 1991). Other studies, which have identified associations with MASC performance, have focused on problems strongly linked to emotional regulation (e.g. persistent somatoform pain disorder, substance misuse; Berking & Wupperman, 2012; Waller & Scheidt, 2006). Across all of these studies impairments in social cognition have been associated with the tendency to make overly interpretative mental state inferences (e.g. overmentalising). This indicates that emotional regulation may be a trans-diagnostic factor linked to social cognition (as predicted by the mentalisation-based model of

psychopathology). Only one study has tested the relationship between emotional regulation and an ecologically valid measure of social cognition – identifying a significant correlation between emotional regulation and hypermentalising but not other types of social cognitive errors. (Sharp *et al.*, 2011b). As such, the relationship between emotional regulation and social cognition warrants further investigation.

Another interesting observation is that rather than being linked to a loss of social cognitive ability *per se*, different psychological problems seem to be associated with qualitatively different variations in mental perspective taking. For example, personality disorders, substance use and persistent somatoform pain disorder seem to be most strongly associated with a tendency to ‘hypermentalise’ (e.g. to make over-interpretative mental state inferences). Whereas, those with mood related difficulties appear more likely to ‘undermentalise’ in social situations. However, the evidence for an association between performance on the MASC and mood is less consistent and less convincing. Finally, it is notable that the majority of studies that utilised the MASC have predominately been carried out within a psychiatric diagnostic framework. Few studies have sought to compare performance on ecologically valid measures of social cognition and trans-diagnostic constructs such as attachment style and emotional regulation.

1.7 Rationale for this thesis and hypotheses

As discussed in this Chapter, those who spend time in local authority care represent a vulnerable population and are more likely to experience emotional and psychological difficulties. Likely a product of their early experiences, adults formerly under the care of local authorities are in frequent use of health and social services. However, there is paucity of studies investigating specific risk factors for psychological difficulties in this population and the little research that has been conducted with care-leavers is rarely embedded in a theoretical model (Stein, 2006a). The mentalisation-based theoretical model for the development of psychopathology, with its focus on attachment relationships, trauma and emotional regulation, offers a useful framework for understanding the psychological and emotional needs of young people who have spent time in care. As discussed in this chapter, one aspect of mentalisation that has

received considerable attention in recent years is social cognition. According to the mentalisation-based theoretical model, social cognitive ability develops within the context of attachment relationships and is disturbed by early trauma (Fonagy & Luyten, 2009). Evidence reviewed in this chapter lends support to these hypotheses. Ecologically valid measures of social cognition have also been used to demonstrate impairments in individuals grouped according to similarities in a range of psychological ‘symptoms’; in particular, those characterised by difficulties with emotional regulation. Emotional dysregulation is a well-established risk factor for many psychological problems in adolescents generally (Neumann *et al.*, 2010) and could underpin many of the psychological problems observed in looked after children and care-leavers (Andrew *et al.*, 2013; Tarren-Sweeney, 2008).

To date no studies have used an ecologically valid measure of social cognition to characterise social cognitive ability in care-leavers and there has been limited research investigating the relationship between social cognition and emotional regulation. As such, this study aims to compare social cognition in care-leavers and a demographically matched young people raised by their birth parents. Building on this, this study sought to test whether care-leavers were more likely to experience difficulties with emotional regulation than their peers, and whether social cognition mediates the relationship between requiring and spending time in local authority and difficulties with emotional regulation. In light of the evidence reviewed in this Chapter, it is hypothesised that:

- 1a) Social cognition, as measured using the MASC, will be significantly impaired in care-leavers compared to demographically matched young people raised by their birth parents. In particular, they will make significantly more over-interpretative mental state inferences.
- 1b) Care-leavers will report significantly more difficulties with emotional regulation than demographically matched young people raised by their birth parents.
- 1c) The relationship between care-leaver status and difficulties with emotional regulation will be partially mediated by social cognition, in particular the tendency to make over-interpretative mental state inferences.

The model put forward by Peter Fonagy and colleagues proposes that the capacity to mentalise develops within the context of attachment relationships. Unresponsive or neglectful parenting undermines the capacity to think about mental states of others, resulting in hyper-responsiveness in interpersonal contexts. In the long term deficits in inferring the mental states of others can leave individuals ‘operating on inaccurate schematic impressions of thoughts and feelings’ (Fonagy, 2000, p. 1133), which can increase vulnerability to emotional regulation difficulties and psychological distress (Fonagy & Luyten, 2009). However, there is a paucity of empirical research aiming to test these predictions. This study will explore the relationship between adult romantic attachment style, social cognition and emotional regulation. Consistent with the mentalisation-based theoretical model for the development of psychopathology, the following hypotheses were made:

- 2a) Adult romantic attachment style will significantly predict variation in social cognition.
- 2b) Adult romantic attachment style will significantly predict variation in emotional regulation.
- 2c) The relationship between adult romantic attachment style and emotional regulation will be partially mediated by social cognition.

Chapter Two

Methodology

2.1 Design

This study used quantitative cross-sectional methodology to explore relationships between social cognition, adult attachment and emotional regulation. Standardised psychometric measures were used to compare care-leavers with a comparison group of individuals raised in private households by their birth parents. All participants were asked to complete the Movie for the Assessment of Social Cognition task (MASC; Dziobek *et al.*, 2006a), the Revised Experiences in Close Relationships (ECR-R; Fraley, et al, 2000) and the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). Correlations, multivariate regression and mediation analysis were employed to explore relationships between MASC performance, adult attachment style and emotional regulation.

2.2 Participants

2.2.1 Power analysis

A power analysis was conducted to determine the required number of participants. As described in Section 1.6, previous studies in clinical populations have identified impairments in overall MASC scores in those meeting diagnostic criteria for psychiatric disorders. Effect sizes have ranged from $d=0.53$ (Ritter *et al.*, 2011) to $d=1.57$ (Montag *et al.*, 2011). Given the potential for increased heterogeneity when using a population ascertained on the basis of previous care (rather than diagnostic classification), the power calculation was based on the smallest effect size observed in previous ‘case-control’ studies using the MASC ($d=0.53$, Ritter *et al.*, 2011). Based on the effect size of $d=0.53$, and using standard parameters of $\alpha = .05$ (one-tailed test) for .80 power to be detected, an estimated 90 participants (45 care-leavers and 45 non-care-leavers) were required (Cohen, 1988).

Due to time constraints and limited availability of potential participants it was only possible to recruit a sample of 30 care-leavers and 35 non care-leavers. This sample provided 67.8% power to detect an effect size of 0.53 and 99.0% power to detect an effect size of 1. It was well powered to investigate bivariate relationships between social cognition, attachment and psychological difficulties. For example, it provided 80% power to detect bivariate correlations coefficients of 0.30 and 95% power to detect correlations of 0.39 ($p < 0.05$). To provide context, a previous study reported a correlation (r) of 0.41 between ‘excess theory of mind’ errors on the Movie for the Assessment of Social Cognition and ‘borderline personality traits (Sharp *et al.*, 2011b).

2.2.2 *Inclusion and exclusion criteria*

All participants were aged between 16-22 and had the capacity to provide informed consent. Care-leavers were eligible for inclusion in the study if they were under the provision of care leaver services *and* met the Children Leaving Care Act (2000) criteria for ‘eligible’, ‘relevant’ or ‘former relevant’ children. Specifically, they had to have spent at least 13 weeks in care since the age of 14. Participants were excluded if they had any visual, auditory or intellectual impairment that would impair their ability to complete the MASC task or the questionnaires. Individuals who were identified as being intoxicated or acutely distressed at the time of the interview were excluded from the study ($n=1$). Leaving care teams were asked to apply these inclusion and exclusion criteria when identifying potential participants. As such, a breakdown of participants who were excluded from this study is not available. Four potential participants identified by the teams did not take part in the study because they either declined consent ($n=2$) or could not find a suitable time to meet with the researcher ($n=2$).

Individuals who had not been in a close relationship with a romantic partner were asked not to complete the ECR-R and were excluded from subsequent analysis of attachment variables (3 care-leavers and 7 non care-leavers).

2.3 Procedure

2.3.1 *Participant recruitment*

Care-leavers were recruited through local authority Leaving Care Teams in two South Wales boroughs and through two third-sector organisations: ‘Voices from Care Cymru’ and ‘Action for Children’. Permission to recruit participants was obtained from service managers. Social workers and personal advisors were provided with the study inclusion and exclusion criteria and were asked to identify young people to take part in the research project. They were asked to provide all young people with equal opportunity to participate and to ensure that potential participants understood that taking part in this research (or declining to take part) would have no impact on their service provision. Young people who expressed an interest in participating were given the study information sheet (see Appendix B). If they remained interested and consented to meeting the researcher, their social worker / personal advisor passed their contact details onto the researcher, who then arranged a time to meet with the participant.

Convenience sampling was used to recruit non-care-leavers from two campuses at Coleg Gwent, South East Wales, providing primarily vocational courses. Between 56% and 77% of students at Coleg Gwent come from areas of ‘high deprivation’ (Estyn, 2012). These campuses were targeted, as students were likely to have similar educational and socio-economic backgrounds to geographically matched care-leavers. Permission to recruit participants was obtained from the relevant personnel within the college. The researcher and Student’s Union representatives informed potential participants about the possibility of taking part in the study. All non care-leavers were provided with a study information sheet (see Appendix C) and the opportunity to ask questions before deciding whether or not to take part in the study.

2.3.2 *Consent*

Participants were asked to sign a consent form to show that they understood the information sheet and agreed to take part in the research (consent forms can be found in Appendices D and E). Participants were asked to endorse statements to

acknowledge that they understood that their participation was voluntary and that they knew how their data was going to be stored and used. Participants in the care-leaver group were also asked to consent to the researcher contacting their social worker or personal advisor to ask questions about their time in care (see Section 2.4.4). All potential participants were informed, both in writing and verbally, that participation in the research was voluntary and that they were free to withdraw at any time up until their data was anonymised, without giving reason and without their clinical care, education or legal rights being affected.

All participants could opt to enter into a prize draw to win one of four £20 shopping vouchers. After data collection was completed two participants from each group were selected at random to receive the vouchers. It was considered that this gesture recognised the contribution of young people who gave up their time to take part in this research, whilst not being so lucrative that it could be considered coercive. The use of a prize draw to recognise the contribution of young people is consistent with other studies in this population (Canning, 2011; Paull, 2013) and can be helpful in preventing relatively disempowered participants 'feeling used' (Broad & Saunders, 1998).

2.3.3 Data collection and storage

Data collection took place between August 2013 and March 2014. Care-leavers were seen either in a private room at the service base or at their homes. Non care-leavers completed the measures in a private room in the college during their free time. Prior to completing the research interview the researcher informed all participants about confidentiality and its boundaries as set out in study information sheets. Participants were invited to complete all measures in the order they are presented in Section 2.5. The Movie for the Assessment of Social Cognition is a digital movie and was displayed as a PowerPoint presentation with embedded video using a laptop computer. Participants recorded their answers on a scoring sheet provided. The researcher was present to explain the process and invited participants to ask questions throughout if they did not understand any of the questions or needed further information. Data collection typically took around one hour. Once those in the care-leaver group had completed the consent form and all measures, their social worker /

personal advisor was contacted to obtain the participant's background information (where consent for this was obtained).

All data, including completed questionnaires, were stored using anonymised participant identifiers. Information linking these identifiers to participant names was recorded and kept in a password-protected file accessible only to the researcher and academic supervisor. Identifying information was destroyed once the participant completed their involvement in the study and background information was obtained from social workers / personal advisors (care-leavers only).

2.3.4 Ethical considerations

2.3.4.1 Ethical approval

Ethical approval for this research project was obtained from Cardiff University School of Psychology research ethics committee (see Appendix H). The study did not recruit participants through NHS settings and did not fulfil NHS National Research Ethics Service (NRES) criteria for determining that a study needs ethical approval from a NRES research ethics committee (<http://www.hra-decisiontools.org.uk/ethics/>).

2.3.4.2 Participant wellbeing

The questionnaires required participants to think about relationships and emotions, which had the potential to cause distress. As such, the project had a detailed procedure for dealing with issues of risk and disclosures (see Appendix I). Study participants were informed about the limits of confidentiality, both verbally and in writing as part of the information sheet. Specifically, participants were informed that if they disclosed information that caused concern for their own or someone else's safety, that the researcher would need to share this information with other professionals. A detailed protocol for dealing with disclosures and confidentiality was developed which complied with Cardiff University Safeguarding Children and Vulnerable Adults Policy and the All Wales Child Protection Procedures (2008).

All participants were provided with a period of ‘debrief time’ after completing all measures and provided with debrief information. For all participants this included contact details for the Researcher and project Clinical Supervisor, which young people were encouraged to use should they feel distressed by any aspect of their participation in this research study. Care-leavers were also provided with an extensive list of organisations they could contact for support (see Appendix F).

2.3.4.3 Researcher wellbeing

A small number of participants were seen in their own home. The study was carried out in accordance with Cardiff & Vale University Health Board’s lone worker policy (see Appendix J). Those in the care-leaver group were identified by their Social Worker or Personal Advisor, who had prior knowledge of the individual and associated risks of home visits.

2.4 Measures

2.4.1 Movie for the Assessment of Social Cognition

The Movie for the Assessment of Social Cognition (MASC; Dziobek *et al.*, 2006a) is a computerised test for the assessment of social cognition that approximates the demands of everyday life. It was developed to be ecologically valid and multi-modal. It comprises a 15 minute film about four characters getting together for an evening of cooking, dining and playing a board game. Through the course of the film, each character experiences different situations that elicit emotions and mental states such as anger, affection, gratefulness, jealousy, fear, ambition, embarrassment or disgust. The movie avoids the use of distracting stimuli (e.g. music, additional characters) and focuses on the predominant themes of friendship and dating issues. It adopts traditional social cognitive concepts such as first- and second-order false belief, faux pas, persuasion, metaphor, sarcasm and irony. An example scene from the MASC can be found in Appendix K.

The film is stopped at 45 points during the plot and questions are asked which refer to the characters’ cognitive (e.g. “What is Cliff thinking?”) and emotional (e.g. “What is

Cliff feeling?") mental states. Participants are provided with four responses options: 1) an accurate mentalising response; 2) an undermentalising response (overly simplistic mental state inferences; 'reduced theory of mind (TOM)' errors); 3) no mentalising response (complete lack of mental state inferencing; 'no TOM errors'); and 4) a hypermentalising response (overly complex mental state inferences; 'excess TOM errors'). Questions and multiple-choice answers were read aloud by the researcher. Participants were asked to record answers in private on a scoring sheet provided.

An overall score for social cognition is calculated by totalling the accurate responses. Correct responses are scored as one point and incorrect responses as zero points. Overall MASC scores can range from 0-45, with higher scores representing better social cognitive abilities. Secondary analyses can be carried out according to 1) *mental state modalities*, which focuses on items requiring participants to interpret emotional or cognitive states of the characters in the file. The MASC contains 13 items requiring the interpretation of emotions and 12 items requiring the interpretation of cognitive states. 2) *error categories*, which allows differentiation of three different types of mistakes that reflect hypermentalising ('Excess Theory of Mind (TOM)'), undermentalising ('reduced TOM') and lack of mentalising ('No TOM'). To control for non-social inferencing, memory and general comprehension effects, six control questions are asked during the test, which refer to physical events, instead of a character's mental state (for example 'What was the weather like on that evening?', where the correct answer has to be inferred from the clothing of the arriving characters).

The MASC has good internal consistency (total scale alpha = 0.84) and test-retest reliability ($r=0.97$; Dziobek *et al.*, 2006a) and has proved sensitive in detecting subtle mindreading difficulties in adults of normal IQ (Dziobek *et al.*, 2006a; Smeets *et al.*, 2009), those diagnosed with Autistic Spectrum Conditions (Dziobek *et al.*, 2006a; Dziobek *et al.*, 2006b), Multiple Sclerosis (Kraemer *et al.*, 2013) and those presenting with a wide range of psychological difficulties as described in Section 1.6. It has been shown to have greater discriminative power than standard social-cognitive tasks (Dziobek *et al.*, 2006a), such as the Reading the Mind in the Eyes test (Baron-Cohen *et al.*, 2001), the Strange Stories Task (Happe , 1994) and basic emotion recognition

(Ekman & Friesen, 1971). Importantly, the MASC appears to be unrelated to IQ (Dziobek *et al.*, 2006a; Preisler *et al.*, 2010; Wolkenstein *et al.*, 2011).

2.4.2 *Experiences in Close Relationships Revised*

The Experiences in Close Relationships – Revised (ECR-R; Fraley, 2000) scale is a 36-item self-report measure of adult attachment that is based on Bartholomew and Horowitz's (1991) model of attachment styles. Participants respond using a 7-point Likert-type scale ranging from 'strongly disagree' to 'strongly agree'. The questionnaire asks participants to answer the questions in relation to the way they generally feel in 'emotionally intimate relationships'. It is not necessary for people completing the questionnaire to be in a relationship at the time they complete it. It yields scores on two sub scales: avoidance (18 items) and anxiety (18 items). Scores across each subscale are averaged to give a score ranging from 1-7. Higher scores represent higher levels of attachment avoidance/anxiety. The initial study reported that the avoidance and anxiety subscales were mostly uncorrelated ($r=0.11$) and that each manifests high degrees of internal consistency ($\alpha \geq 0.90$).

A number of studies have demonstrated the internal consistency, as well as the construct, predictive, and discriminative validity of the attachment anxiety and avoidance scales produced by the ECR-R (Crowell *et al.*, 1999; Fraley *et al.*, 2000; Sibley *et al.*, 2005; Sibley & Liu, 2004; Tsagarakis *et al.*, 2007). The internal consistency and factor validity of the scale have been independently replicated and the subscales have shown high test-retest reliability ($r^2=0.86$) over a 6-week period (Sibley & Liu, 2004). In contrast to the Adult Attachment Interview, which requires a large amount of training, the ECR-R is quick and simple to administer. Importantly, it has also been shown to be appropriate for the assessment of attachment in young adults (Simard *et al.*, 2011) and those with complex psychological difficulties (Levy, 2005)

Scores obtained on the ECR-R are typically used to generate continuous measures of attachment anxiety and attachment avoidance. Some have chosen to use scores derived from the two dimensions of the ECR-R to categorise people according to recognised attachment categories (e.g. secure, preoccupied, dismissive and fearful avoidance). However, this study will restrict analyses to continuous scores on the two

ECR-R dimensions. This is for a number of reasons. First, taxometric analyses on multiple samples and measures, including the strange situation (Fraley & Spieker, 2003), self-reports of attachment in adults (Fraley & Waller, 1998) and the adult attachment interview (Roisman *et al.*, 2007a), suggest that variation in attachment is best modelled with dimensions rather than categories. Second, there are no normative data for the ECR-R so categorisation relies on arbitrary cut-offs, such as the utilising the sample median. This approach reduces the precision of measurement and statistical power (Cohen, 1988), leading to increased risk of type-1 (Austin & Brunner, 2004) and type-2 error (Altman & Royston, 2006). Finally, by analysing the two dimensions simultaneously in a regression framework the results can be interpreted in a way that is conceptually aligned with Bartholomew and Horowitz's (1991) model of attachment styles. The attachment and anxiety dimensions of the Experiences in Close Relationships scale (ECR) were correlated in this sample, $r(57) = .510, p < .001$.

2.4.3 *Difficulties in Emotion Regulation Scale*

The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a comprehensive measure of emotional regulation that is based on theoretical literature about emotional regulation in young people (Cole *et al.*, 1994; Thompson, 1994). It contains 36-items, which are scored on a five-point Likert scale ranging from 1 ('almost never') to 5 ('almost always'). The maximum score on the DERS is 180, with higher scores indicating greater emotion dysregulation. Separate sub scores can be calculated that represent: a) non-acceptance of emotional responses ('non-acceptance'; 6 items); b) difficulties engaging in goal-directed behaviour ('goals'; 5 items); c) impulse control difficulties ('impulse'; 6 items); d) lack of emotional awareness ('awareness'; 6 items); e) limited access to emotion regulation strategies ('strategies'; 8 items) and f) lack of emotional clarity ('clarity'; 5 items). For each subscale the mean score across items is calculated, with higher scores indicating greater difficulties.

The DERS has been used extensively with young people (e.g. Adrian *et al.*, 2009; Neumann *et al.*, 2010; Sharp *et al.*, 2013; Sharp *et al.*, 2011b). It has demonstrated good construct validity and high internal consistency (Cronbach's alpha > 0.86; Gratz & Roemer, 2004; Neumann *et al.*, 2010; Sharp *et al.*, 2011b), as well as good test-

retest reliability over 4-8 weeks ($r=0.88$; Gratz & Roemer, 2004). Research using the DERS has repeatedly linked it to clinically relevant phenomena in both clinical (e.g. Fox *et al.*, 2008; Gratz *et al.*, 2008; Sharp *et al.*, 2011b) and nonclinical samples (e.g. Gratz & Roemer, 2004; Johnson *et al.*, 2008). The factor structure has been established in adolescents (Neumann *et al.*, 2010) and adults (Gratz & Roemer, 2004). The utility of DERS subscales has been demonstrated by previous studies that have shown particular subscales to be differentially associated with specific psychological problems (Salters-Pedneault *et al.*, 2006; Tull *et al.*, 2007). Previous studies have reported that females scored higher on several DERS subscales than males (Neumann *et al.*, 2010).

2.4.4 *Experience of being in care*

Participants in the care-leaver group were not asked direct questions about their experiences before and during their time in care, as it was felt this may cause distress in the context of a research interview. Instead they were asked to provide the name of a social worker or personal advisor who could provide this information. Specifically, where consent was obtained, the following information was obtained:

- The participant's age when they were placed into care
- The reason why the participant was placed into care
- Total number of care placements
- Whether the participant had returned to live with their birth family for any amount of time

A copy of the research questionnaire can be found in Appendix L.

2.5 **Statistical Analysis**

2.5.1 *Univariate and multivariate analyses.*

Data analysis was completed using SPSS version 20 (IBM Corporation 2011). All continuously distributed data were screened to ensure they met the assumptions for parametric testing. Specifically, they were inspected to identify outliers and spurious data points, tested for deviation from a normal distribution and checked to ensure equality of variance in the care-leaver and non-care leaver groups (see Section 3.1).

Independent samples *t*-tests, using published means and standard deviations, were used to compare MASC, ECR-R and DERS data from the current study with other studies.

Bivariate relationships between demographic characteristics of the sample and the main study variables were assessed to identify possible confounders that would need to be controlled for in subsequent analyses. Categorical and continuously distributed data were assessed using the χ^2 test, Cramér's *V* test of association or independent samples *t*-tests as appropriate. Pearson's correlation coefficients, *t*-tests and ANOVA were used to investigate the relationship between age, gender, years of education, participants' level of qualifications and the main study variables (e.g. DERS, ECR-R and MASC variables).

Analysis of covariance (ANCOVA) was used to compare DERS and MASC total scores between care-leavers and non-care-leavers, controlling for participant's level of qualifications. Separate MANCOVAs were conducted to explore the relationship between care-leaver status and 1) subscales of the DERS; 2) errors categories of the MASC (e.g. 'No TOM', 'reduced TOM' and 'excess TOM' errors); and 3) mental state modalities on the MASC (e.g. emotions and cognitive mental state inferences).

Fraley and colleagues recommend carrying out multivariate analyses of the two attachment dimensions assessed by ECR-R (e.g. anxiety and avoidance) within a regression framework (e.g. $Y = \alpha + \beta(\text{anxiety}) + \beta(\text{avoidance}) + \varepsilon$; see <http://internal.psychology.illinois.edu/~rcfraley/measures/ecrr.htm>). Simultaneous inclusion of the two dimensions in a regression framework allows the results to be interpreted in a manner that is conceptually aligned with Bartholomew's four attachment prototypes, without having to impose arbitrary cut-offs on the attachment dimensions to classify individuals as having secure, fearful, preoccupied or dismissing attachment classifications. As such, the relationships between attachment and total scores on the DERS and MASC were assessed using a three-step linear regression model. In the first step, care-leaver status and participants' level of qualification were added to the model. In the second step, the two attachment dimensions of anxiety and avoidance were added simultaneously to the model. In the

final step, separate interaction terms (group*anxiety and group*avoidance) were entered into the model to test whether the *relationship* between attachment and the dependent variable (DERS or MASC) differed in care-leavers compared to non care-leavers. Multivariate multiple regression was used to test the relationship between the two attachment dimensions and 1) errors categories of the MASC (e.g. ‘No TOM’, ‘reduced TOM’ and ‘excess TOM’ errors); and 2) mental state modalities on the MASC (e.g. cognitive and emotional), controlling for the confounding effects of care leaver status and level of qualifications.

Before completing regression analyses, scatterplots were inspected to ensure that the relationship between the independent and dependent variables was approximately linear. Additionally, statistical checks were carried out to ensure that all regression models met the assumptions relevant to regression analyses. Specifically, a histogram of the standardised residuals was inspected to ensure that they were approximately normally distributed; standardised residuals were plotted against predicted *Y* values to check for homoscedasticity; outliers were inspected and removed where necessary (utilising a cut of Cook’s Distance ≥ 1 and standardised residual ≥ 3 , (Cook, 2000)). Finally, the variance inflation factor (adopting a cut off of ≥ 5 ; O’Brien, 2007) and condition index (adopting a cut off of ≥ 30 ; Kirkwood & Sterne, 2003) were inspected to identify issues of multi-collinearity.

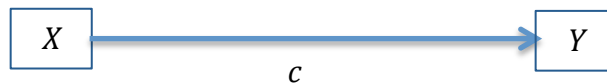
2.5.2 *Mediation analysis*

Mediation analysis was used to further dissect the relationship between care-leaver status, MASC performance, difficulties with emotional regulation and romantic attachment. Mediation analyses are typically conducted when it is hypothesised that a significant amount of the variance in the relationship between an independent variable (Variable *X*; e.g. care-leaver status) and dependent variable (Variable *Y*; e.g. difficulties with emotional regulation) is explained by a third variable (Variable *M*; e.g. erroneous social cognition). Put simply, *X* causes *M*, and *M* causes *Y*. Mediation models, illustrated in Figure 2.1, offer an opportunity to test such predictions.

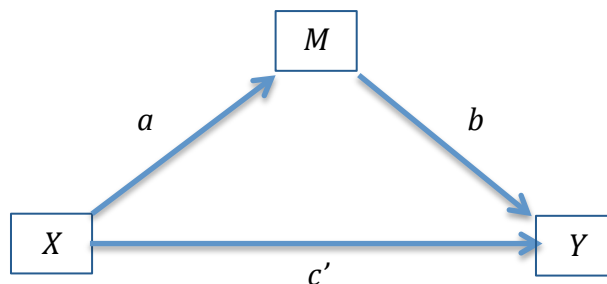
In such models the *total effect* of *X* on *Y* is denoted as path *c* (See Figures 2.1a). Adding a mediator variable, *M*, allows the *a* coefficient for *X* to be calculated in a model predicting *M* from *X*, as well as the *b* coefficient derived from predicting *Y*

from M (Figure 2.2b). The c' coefficient represents the *direct effect* of X on Y controlling for a and b , whereas the product of a and b quantifies the *indirect effect* of X on Y through M (Baron & Kenny, 1986). The *indirect effect* (or mediation effects) represents the difference between the *total* and *direct* effect of X (e.g. $ab = c - c'$). More complex, multiple mediator models can be calculated by adding additional mediators, where the indirect effect through a given mediating variable is called the specific indirect effect (Hayes, 2009). This is conceptualised graphically in Figure 2.1(c), where M and W represent different potential mediator variables, with corresponding specific indirect effects labelled, a_1b_1 and a_2b_2 , respectively.

- a. Total effects of X on Y .



- b. Simple mediation model representing the *direct* (c') and *indirect effects* (ab) of X on Y .



- c. Multiple mediator model, with *specific* (a_1b_1 and a_2b_2) and *total* (ab) indirect effects

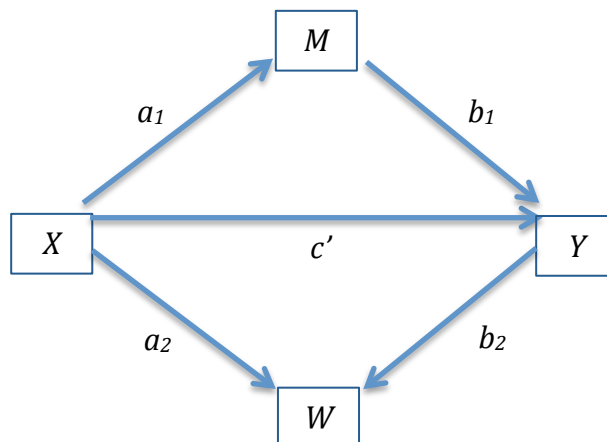


Figure 2.1 (a) Total effect of X and Y model; (b) a simple mediation model; and (c) a multiple mediator model. Adapted from Hayes (2009)

In such a model the total effect is equal to the direct effects of X on Y , plus the sum of indirect affects through all possible mediators (e.g. $c = c' + a_1b_1 + a_2b_2$).

Traditionally, mediation has been assessed using the ‘causal steps approach’ (Baron & Kenny, 1986). This involves completing a two-step hierarchical regression; first, testing the relationship between the independent and dependent variable; and then adding the proposed mediator to the model. Using this approach a mediation effect is indicated if both a and b paths are statistically significant and the relationship between X and Y becomes statistically less significant when M is added to the model (Baron & Kenny, 1986). However, this approach has been criticised for lacking power (Fritz & Mackinnon, 2007; Mackinnon *et al.*, 2002) and failing to directly test for mediation (Hayes, 2009). Inferential approaches, such as the Sobel test (Sobel, 1982), have sought to address these shortcomings. However, they typically assume that the sampling distribution of the indirect effect is normal, an assumption that is frequently violated (Bollen & Stine, 1990; Lockwood & Mackinnon, 1997). Non-parametric bootstrapping approaches do not make this assumption and have been shown in simulation studies to be more powerful and to have more accurate overall Type-I error than the Sobel test and the causal steps approach, especially in small samples (Williams & Mackinnon, 2008).

In this study, mediation analysis with bootstrapping was carried out in SPSS, utilising the custom PROCESS dialogue box available from: <http://www.afhayes.com/spss-sas-and-mplus-macros-and-code.html>. The non-parametric bootstrap approach directly tests the significance of the indirect (or mediating) effects. Empirical representations of the sampling distribution of the indirect effect are obtained through bootstrapping, where k ‘mimic’ samples are obtained from the obtained data by repeatedly resampling the original sample with replacement. Once a sample size equivalent to the original n is sampled, a and b are estimated in the resampled dataset. The process is repeated k times, with a and b coefficients recorded in each sample. In this study, 10,000 bootstrap samples (k) were generated. The distribution of a and b coefficients in the permuted datasets serves as an empirical approximation of the sampling distribution and is used to generate bias-corrected percentile-based confidence intervals for indirect effects. Although, p -values are not computed

explicitly, the null hypothesis can be rejected at the $p < .05$ level of significance if the lower and upper bounds of the 95% confidence intervals do not cross zero. Multiple mediators can be analysed within the same model, producing estimates of specific and total indirect effects (i.e. the sum of all specific effects in the model) (Preacher & Hayes, 2008). Specific effects can be contrasted with one another to determine whether the indirect effect of X on Y through a proposed mediator (M) differs in size from specific indirect effect through another proposed mediator (W) (e.g. whether a_1b_1 differs significantly from a_2b_2).

Chapter Three

Results

3.1 Assumptions for parametric statistics

All data were checked visually and analyses were completed to ensure that all variables met the assumptions for subsequent parametric testing. The following variables were assessed: Difficulties with Emotional Regulation (DERS) total score; Experience of Close Relationships Revised (ECR-R) anxiety and avoidance scales; Movie for Assessment of Social Cognition (MASC; total score and sub scores relating to error categories and mental state modalities).

3.2.1 *Outlier check and missing data*

One participant in the care leaver group did not complete the DERS due to time constraints. This participant also did not complete the ECR-R as they did not have a history of a close romantic relationship. However, they had completed the MASC and all other demographic questions and so their data were retained in the analysis of MASC variables. No other missing data were identified for any MASC or DERS variables. Two individuals in the non-care leaver group did not specify whether they had ever been in a relationship and a further two individuals completed the ECR-R despite stating they had not been in a relationship. All of these individuals were excluded from analyses that included the ECR-R. A total of 27 care-leavers and 28 non care-leavers reported a history of a close romantic relationship and completed the ECR-R. Visual inspection of the data did not identify any data entry errors. Outlier analysis was carried out to identify extreme data points that might exert disproportionate leverage in subsequent statistical analyses. Inspection of the frequency distributions and the corresponding box plots identified one outlier in the non care-leaver group on the reduced theory of mind (TOM) variable (observed value 13, mean in non care-leaver group excluding this participant = 3.00, SD = 2.43). Utilisation of an outlier labelling technique indicated that only values above 13.4 could reliably be identified as true outliers amongst non care-leavers on this variable (Hoaglin & Iglewicz, 1987; Hoaglin *et al.*, 1986). This suggests that the observed data

point may be a genuine score at the extreme end of a normal distribution. Furthermore, as the outlier was observed in the comparison group and was counterintuitive to the research hypothesis it was considered more conservative to retain this data in subsequent analyses (e.g. removal of this participant would inflate test statistics when comparing social cognition in care-leavers and non care-leavers).

3.2.2 *Check for normality*

All variables had standardised skewness and kurtosis statistics within the range of -1.96 and 1.96 (Doane & Seward, 2011). Shapiro-Wilk's tests ($p > .05$; Razali & Wah, 2011; Shapiro & Wilk, 1965), as well as visual inspection of the histograms, normal Q-Q plots and box plots, indicated that all variables were approximately normally distributed for both care-leavers and non care-leavers, with the exception of mean ECR-R anxiety score in non care-leavers. Log¹⁰ transformations were performed to normalise ECR-R anxiety scores. The data was analysed using the non-transformed and the transformed data, which yielded very similar results. Analyses of the non-transformed data are reported.

3.2.3 *Check for homogeneity of variance*

Levene's test for homogeneity of variance verified equality of variances in the care-leaver and non care-leaver groups for all normally distributed continuous variables ($p > .05$) (Kirkwood & Sterne, 2003). As noted in the previous section, mean ECR-R anxiety score was not normally distributed. A non-parametric Levene's test was used to verify equality of variances for this variable ($p > .05$) (Nordstokke & Zumbo, 2010; Nordstokke *et al.*, 2011).

3.3 **Characteristics of the sample**

3.3.1 *Demographic and background characteristics of the sample*

Basic characteristics of the sample can be found in Table 3.1. The care-leaver and non care-leaver groups did not differ significantly with regard to gender, years in full-time education, or current/previous relationship status ($p > .05$). The mean age amongst care-leavers ($M=19.2$, $SD=1.7$) was significantly higher than in the comparison group ($M= 18.0$, $SD=1.7$); $t_{(63)}=-2.74$, $p = .008$. Educational qualifications differed between the care-leaver and non care-leaver groups ($V=.31$, $p=.047$). Compared with care-

leavers, a higher proportion of non care-leavers had qualifications at Level 2. The domestic living arrangements of care-leavers and non care-leavers differed significantly ($V=.58, p < .001$). As can be seen in Table 3.1, 27 non care-leavers were living with family (77.1%), compared to only 7 care-leavers (23.3%). Care-leavers were also more likely than non care-leavers to have spoken to a professional about their thoughts and feelings; $\chi^2_{(1, 65)}=24.2, p < .001$.

Table 3.1 Socio-demographic characteristics of the care-leaver and non care-leaver groups

	Care-leavers (n=30)	Non Care leavers (n=35)	Sig.
Number of female (%)	25 (83.3)	25 (71.4)	$\chi^2 = 0.13, p=.256$
Mean age, years (SD)	19.2 (1.7)	18.0 (1.7)	$t=-2.74, p=.008$
Mean years in full time education (SD)	13.1 (1.1)	13.1 (1.0)	$t=0.07, p=.943$
Qualifications, n (%)			
None	7 (23.3)	4 (11.4)	$V=.31, p=.047$
Level 1	19 (63.3)	17 (48.6)	
Level 2	4 (13.3)	14 (40.0)	
Domestic living arrangements, n (%)			
Living alone	6 (20.0)	1 (2.9)	$V=.58, p<.001$
Living with partner	9 (30.0)	6 (17.1)	
Living with family or foster carer	7 (23.3)	27 (77.1)	
Living with friends	2 (6.7)	1 (2.9)	
Supported accommodation	4 (13.3)	0 (0.0)	
Living in temporary accommodation	2 (6.7)	0 (0.0)	
Current relationship status, n (%)			
Single	13 (43.3)	16 (45.7)	$V=.16, p=.422$
In a relationship (not cohabitating)	8 (26.7)	13 (37.1)	
In a relationship (cohabitating)	9 (30.0)	6 (17.1)	
History of a close romantic relationship, n (%)			
Yes	27 (90.0)	28 (84.8)	$\chi^2 = 0.376, p=.540$
No	3 (6.7)	5 (15.2)	
Did not specify	0	2	
Therapy, n (%)			
Yes	26 (86.7)	9 (25.7)	$\chi^2 = 24.2, p<.001$
No	4 (13.3)	26 (74.3)	

Background care data were obtained for 17 participants in the care leaver groups. Seven care-leavers did not consent to the researcher obtaining information about their care background and limited resources within leaving care teams meant that they were not able to obtain complete data for the remaining six participants. Utilising the available the mean age at entry into care was 11.4 years (SD=3.6; range 4 – 15 years). The mean number of placements was 4.1 (SD=2.77; range 2-12).

3.3.2 Clinical Characteristics of the sample

Means, standard deviations, and ranges for all the main study variables are summarised in Table 3.2. Bivariate correlations between the main study variables are summarised for reference in Table 3.3. More detailed analyses of the relationship between clinical and social cognitive variables can be found in Section 3.4 and Section 3.5.

Table 3.2 Descriptive statistics for clinical and social cognitive variables in the care-leaver and non care-leaver groups.

	Care-leavers (n=30)			Non Care-leavers (n=35)		
	Mean	SD	Range	Mean	SD	Range
DERS total score^a	102.0	28.3	51-149	78.2	22.1	45-133
ECR^b						
Attachment anxiety	3.5	1.0	1.3-5.1	2.8	1.1	1.3-4.3
Attachment avoidance	3.2	1.0	1.2-4.6	2.4	1.0	1.0-4.5
MASC						
Total correct	28.2	4.4	17-36	32.4	4.4	25-43
Error categories						
No TOM	3.1	1.6	0-6	2.5	1.7	0-6
Reduced TOM	4.4	2.1	1-9	3.3	2.9	0-13
Excess TOM	9.2	3.4	3-19	6.8	3.0	0-13
Mental state modalities						
Emotions sub-score	8.5	1.7	4-11	9.6	1.7	6-12
Cognitive sub-score	7.5	2.3	2-12	8.5	2.1	4-12
Non social inferencing	4.8	0.9	3-6	4.9	1.0	3-6

DERS=Difficulties in Emotion Regulation Scale; **ECR**=Experiences in Close Relationships Scale; **MASC**=Movie for the Assessment of Social Cognition. ^a ECR-R data was only available for young people who had experience in close relationship (27 care-leavers and 28 non care-leavers).

Table 3.3 Bivariate correlations between the main study variables.

	Age	Yrs Educ	DERS	ECR Anx	ECR Avoid	MASC Total	MASC No TOM	MASC Reduced TOM	MASC Excess TOM	MASC: Emotions	MASC: Cognitive
Yrs Educ	0.32*	-									
DERS	0.12	-0.02	-								
ECR Anx	-0.08	-0.05	0.50**	-							
ECR Avoid	-0.08	-0.23	0.38**	0.51**	-						
MASC Total	0.00	0.20	-0.41**	-0.38**	-0.41**	-					
MASC No TOM	-0.03	-0.25*	0.05	0.01	0.30*	-0.49**	-				
MASC Reduced TOM	-0.07	-0.13	0.18	0.19	0.22	-0.63**	0.25*	-			
MASC Excess TOM	0.07	-0.06	0.41**	0.43**	0.29*	-0.69**	0.00	-0.01	-		
MASC: Emotions	-0.13	-0.06	-0.34**	-0.38**	-0.28*	0.55**	-0.26*	-0.21	-0.50**	-	
MASC: Cognitive	0.10	0.23	-0.13	-0.27*	-0.28*	0.79**	-0.37**	-0.54**	-0.52**	0.18	-
MASC Control	0.01	-0.01	-0.32*	-0.13	-0.15	0.27*	-0.22	-0.15	-0.14	0.04	0.14

Yrs Educ=Years in Education; **DERS**=Difficulties in Emotion Regulation; **ECR Anx**=Experience in Close Relations Anxiety Scale; **ECR Avoid**=Experience in Close Relations Avoidance Scale; **MASC**= Movie for Assessment of Social Cognition. All values are Pearson correlation coefficients (r). * $p < .05$; ** $p < .01$.

3.3.3 *Relationship between demographic and clinical characteristics of the sample*

The relationships between age, gender, years in education, qualifications and the main study variables were investigated to identify potential confounding variables to consider in subsequent analyses (see Table 3.4).

Pearson's correlation coefficients were calculated to test the relationship between age and years in education with DERS, ECR-R and MASC variables. Age was not correlated significantly with any of the main study variables ($p > .05$). 'Years in education' was negatively correlated with the number of 'No TOM' errors on the MASC ($r_{(63)} = -.25, p = .043$) and showed a trend toward association with total MASC score ($r_{(63)} = .20, p = .103$). Independent t-tests did not identify any significant differences between males and females on the main study variables ($p > .05$).

Analysis of Variance (ANOVA) was carried out to compare scores on the DERS, ECR-R and MASC in those with no qualifications, level 1 and level 2 qualifications. A significant group effect of 'qualifications' was observed with total MASC score ($F_{(2,62)} = 5.299, p < .008$) and 'reduced TOM' errors ($F_{(2,62)} = 5.299, p < .007$). Tukey's post-hoc tests revealed that total MASC scores were significantly lower in those with no qualifications ($p < .039$) and level 1 qualifications ($p < .007$), compared with those with level 2 qualifications. Correspondingly, more 'reduced TOM' errors were made by those with no qualifications ($p < .026$) and level 1 qualifications ($p < .011$), compared with those with level 2 qualifications. Those with no qualifications and level 1 qualifications did not differ significantly on either the total MASC score or 'reduced TOM' errors ($p > 0.05$). See Table 3.4 for means and standard deviations.

Table 3.4 Relationship between gender, age, education and the main study variables.

	Pearson correlation coefficients (<i>r</i>)		Mean Score (SD)				
			Gender		Highest Qualifications		
	Age	Years in Education	Female (n=50)	Male (n=15)	None (n=11)	Level 1 (n=36)	Level 2 (n=18)
DERS total score	0.12	-0.02	91.5 (28.5)	80.8 (23.5)	89 (22.1)	95.1 (28.8)	77.2 (25.6)
ECR-R							
Attachment anxiety	-0.08	-0.05	3.2 (1.1)	3.1 (1.0)	3.1 (1.1)	3.3 (1.1)	3.0 (1.1)
Attachment avoidance	-0.08	-0.23	2.9 (1.1)	2.5 (0.9)	2.4 (1.1)	3.1 (1.0)	2.5 (1.1)
MASC							
Total correct	0.00	0.20	30.4 (4.7)	30.8 (5.5)	29.4 (4.8)	29.4 (4.6)	33.4 (4.3)**
Error categories							
Excess TOM	0.07	-0.06	8.1 (3.4)	7.5 (3.5)	8.5 (4.2)	8.2 (3.4)	7.1 (2.8)
No TOM	-0.03	-0.25*	2.7 (1.7)	3.0 (1.6)	2.6 (1.0)	3.1 (1.6)	2.2 (2.2)
Reduced TOM	-0.07	-0.13	3.9 (2.6)	3.7 (2.8)	4.7 (1.8)	4.3 (2.8)	2.2 (1.9)**
Mental state modalities							
Emotions sub-score	-0.13	-0.06	9.3 (1.7)	8.6 (1.9)	8.5 (1.9)	9.1 (1.7)	9.5 (1.9)
Cognitive sub-score	0.10	0.23	7.9 (2.2)	8.5 (2.4)	7.7 (1.8)	7.5 (2.3)	9.2 (1.9)
Non social inferencing	0.01	-0.01	4.8 (0.9)	5.1 (0.8)	5.0 (0.9)	4.8 (0.9)	4.8 (1.0)

DERS=Difficulties in Emotion Regulation Scale; **ECR-R**=Experiences in Close Relationships Revised Scale;

MASC=Movie for the Assessment of Social Cognition.

* $p < .05$, ** $p < .01$.

Given that level of qualifications was significantly associated with total MASC score and ‘No TOM’ errors, and that there was a significant difference in educational achievement when comparing the care-leaver and non-care leaver groups, it was considered necessary to control for the confounding effects of ‘qualifications’ in subsequent analyses. Differences in MASC performance were observed when comparing those with level 2 qualifications with those who reported having no qualifications or level 1 qualifications. Those with no qualifications did not differ significantly from those with level 1 qualifications. As such, a binary variable was entered as a covariate in subsequent analysis including MASC, contrasting those with Level 2 qualifications with those with either no qualifications or level 1 qualifications. It was not considered necessary to control for age or gender in subsequent analyses, as they were not associated with any outcome variables in this study ($p < .05$).

3.3.4 Comparison with previously reported data

In order to contextualise these data, mean scores on the MASC, DERS and ECR-R were compared with published data from elsewhere. There are no normative data for the DERS, MASC or ECR-R. As such, mean scores on the DERS and ECR-R in the current study were compared with published studies that have reported data from large, non-clinical samples of young people. MASC data from the current study were compared with existing data from the studies reviewed in Section 1.6.

3.3.4.1 Difficulties with Emotional Regulation Scale

Mean DERS scores in the current study were compared with existing data from 357 undergraduate students in the US (Gratz & Roemer, 2004) and from 870 adolescents recruited in Holland (Neumann *et al.*, 2010). Whilst these data aren’t ‘norms’, they represent the largest samples of DERS data published for a ‘non-clinical’ group of young people and therefore provide an appropriate comparison for data from the present study. The mean DERS score in care-leavers ($M=102.0$, $SD=28.3$), was significantly higher than the mean observed in the sample of undergraduate students reported by Gratz *et al.* ($M=78.0$, $SD=20.7$; $t_{(384)}=-5.825$, $p < .001$) and the large sample of adolescents recruited by Neumann *et al.* ($M=78.5$, $SD=26.9$; $t_{(897)}=-4.613$, $p < .001$). The mean DERS scores in non care-leavers ($M=78.2$, $SD=22.1$) did not differ

significantly from the means observed in the sample of undergraduate students reported by Gratz *et al.* ($M=78.0$, $SD=20.7$; $t_{(391)}=-.057$, $p = .955$) and the sample of adolescents recruited by Neumann *et al.* ($M=78.5$, $SD=26.9$; $t_{(903)}=0.072$, $p = .943$).

3.3.4.2 *Movie for the Assessment of Social Cognition*

As can be seen in Table 3.5, the mean total MASC score in the care-leaver group was significantly lower than the means observed in groups of individuals ascertained on the basis of meeting diagnostic criteria for depression (Wilbertz *et al.*, 2010; Wolkenstein *et al.*, 2011) and narcissistic personality disorder (Ritter *et al.*, 2011). The mean total MASC score in care-leavers was also significantly lower than the average score observed in a group of adolescent inpatients (Sharp *et al.*, 2011b), as well as scores for recreational and dependent cocaine users (Preller *et al.*, 2013) ($p < .05$). In contrast, the mean total MASC score in care-leavers did not differ significantly from the means observed in groups meeting diagnostic criteria for borderline personality disorder (Preisler *et al.*, 2010; Ritter *et al.*, 2011), bipolar affective disorder (Montag *et al.*, 2010) and somatoform pain disorder (Schönenberg *et al.*, 2014) ($p > 0.05$). This indicates that on average those in the care-leaver group presented with impairments in social cognition that are at consistent with, and in some cases worse, than those observed in individuals with a broad range of mental health difficulties. The mean total MASC score in the non care-leaver group was also significantly lower than the comparison groups in four of the eight studies which reported ‘control data’ for the total MASC ($p < .05$; see Table 3.5).

Table 3.5 Comparison of MASC performance in the current study with previously reported data.

Study	Population	N	Mean Age	Total MASC Score	
				Mean	SD
Clinical Groups					
Current	Care leavers	30	19.2	28.2	4.4
Preissler <i>et al.</i> (2010)	BPD	64	29.2	29.9	7.8
Ritter <i>et al.</i> (2011)	NPD without BPD	22	32.4	31.1*	5.1
	BPD without NPD	27	30.0	29.8	8.2
Sharp <i>et al.</i> (2011)	Adolescent inpatients	107	15.5	31.8***	5.5
Wilbertz <i>et al.</i> (2010)	Depression	16	44.4	32.4**	5.8
Wolkenstein <i>et al.</i> (2011)	Depression	24	37.2	32.9***	4.8
Montag <i>et al.</i> (2010)	BPAD	29	44.0	30.7	5.4
Montag <i>et al.</i> (2011)	PSZ	80	39.1	25.0*	7.9
Preller <i>et al.</i> (2013) ^a	RCU	69	28.1	33.7***	4.0
Preller <i>et al.</i> (2013) ^a	DCU	31	34.8	31.2**	4.3
Schönenberg <i>et al.</i> (2014)	PSPD	19	47.1	29.5	7.3
Comparison Groups					
Current	Non Care-leavers	35	18.0	32.4	4.4
Preissler <i>et al.</i> (2010)	Controls	38	31.7	35.6**	3.9
Ritter <i>et al.</i> (2011)	Controls	53	33.2	33.3	5.3
Wilbertz <i>et al.</i> (2010)	Controls	16	43.1	32.4	5.2
Wolkenstein <i>et al.</i> (2011)	Controls	20	35.7	35.9**	4.5
Montag <i>et al.</i> (2010)	Controls	29	39.7	34.6*	3.7
Montag <i>et al.</i> (2011)	Controls	80	38.4	34.1*	3.7
Preller <i>et al.</i> (2013) ^a	Controls	68	29.8	33.9	4.0
Schönenberg <i>et al.</i> (2014)	Controls	19	46.2	34.5	4.0

BPAD=Bipolar affective disorder; **BPD**=Borderline personality disorder; **DCU**=Dependent cocaine user; **NPD**=Narcissistic personality disorder; **PSPD**=Persistent Somatoform Pain Disorder; **PSZ**=Paranoid schizophrenia; **RCU**=Recreational cocaine user.

* $p < .05$, ** $p < .01$, *** $p < .001$. ^a Summary data obtained from M Preller (personal communication, August 30, 2013).

3.3.4.3 Experience of Close Relationships Scale

Mean ECR-R scores in care-leavers and non care-leavers were compared with data from a study by Fraley *et al.* (2011), which included a sample of 388 young adults (mean age 22.6) and reported a mean ECR-R anxiety score of 2.85 (SD=1.12) and a mean avoidance score of 2.34 (SD=0.98). These data did not differ significantly from the mean ECR-R anxiety ($M=2.84$, $SD=1.05$; $t_{(411)}=0.036$, $p = .971$) and avoidance scores ($M=2.45$, $SD=0.95$; $t_{(411)}=0.551$, $p = .582$) observed in the non care-leaver group. However, between groups t -tests identified a significant difference between the

means observed by Fraley *et al.* (2011) and the mean scores in the care-leaver group, for both the ECR-R anxiety ($M=3.54$, $SD=1.04$; $t_{(414)}=3.092$, $p = .002$) and ECR-R avoidance dimensions ($M=3.19$, $SD=0.99$; $t_{(414)}=-4.34$, $p < .001$). Inspection of the group means revealed that care-leavers reported significantly higher attachment related anxiety and avoidance on the ECR-R compared with the group of young people studied by Fraley and colleagues.

3.4 Care-leaver status, emotion regulation and social cognition.

The primary hypotheses of this thesis predict that care-leavers will report greater difficulties with emotional regulation and greater impairment in social cognition than demographically matched young people remaining the care of their birth parents. It was predicted that impairments in social cognition in care-leavers would be particularly characterised by a tendency to make overly interpretative mental state inferences (excess TOM) and that social cognitive ability would mediate the relationship between care-leaver status and emotional regulation. These hypotheses were tested, first, by comparing difficulties with emotional regulation and social cognition in care-leavers and non care-leavers controlling for level of qualifications; and second, by utilising mediation analysis to determine whether the relationship between care-leaver status and difficulties with emotional regulation was mediated by social cognition, as measured by the MASCS.

3.4.1 Between-group comparisons

3.4.1.1 Difficulties with Emotional Regulation

An Analysis of Variance (ANOVA) was carried out to compare mean scores on the Difficulties in Emotion Regulation scale (DERS) between care-leavers and non care-leavers. A significant effect of care-leaver status was identified, $F_{(1,59)}= 14.32$, $p < .001$, $\eta_p^2=.188$). Inspection of the group means revealed significantly higher scores for care-leavers ($M=102.0$, $SD=28.3$) compared to non care-leavers ($M= 78.2$, $SD=22.1$), indicating that those in the care-leaver group had greater difficulties with emotional regulation.

A MANOVA was conducted to compare care-leavers and non care-leavers across different components of emotional regulation, utilising DERS subscales as dependent variables. This included the following subscales: a) non-acceptance of emotional responses ('non-acceptance'); b) difficulties engaging in goal-directed behaviour ('goals'); c) impulse control difficulties ('impulse'); d) lack of emotional awareness ('awareness'); e) limited access to emotion regulation strategies ('strategies') and f) lack of emotional clarity ('clarity'). A statistically significant MANOVA effect was obtained (Wilk's λ $F_{(6,57)}=4.105, p = .003, \eta_p^2=.283$). Univariate between-subjects tests found significant differences between care-leavers and non care-leavers across all DERS subscales ($p < .05$). Inspection of the group means indicated that, compared to the non care-leaver group, those in the care-leaver group had significantly greater difficulties with emotional regulation across all components of emotional regulation assessed by the DERS (See Table 3.6). As such, subsequent analyses were restricted to total DERS score, which represents a composite measure of all DERS subscales.

Table 3.6 Table showing between-group differences for the Difficulties with Emotional subscales

Subscale	Care-leavers (n=29)		Non care-leavers (n=35)		Sig ^a
	Mean	SD	Mean	SD	
Awareness	2.96	0.77	2.61	0.68	$F=3.62, p = .041$
Clarity	2.73	0.92	1.99	0.63	$F=14.50, p < .001$
Goals	3.36	0.96	2.56	0.86	$F=12.34, p < .001$
Impulse	2.90	1.17	1.99	0.68	$F=15.27, p < .001$
Non-acceptance	2.43	0.93	1.93	1.15	$F=3.50, p = .043$
Strategies	2.73	1.14	2.04	0.85	$F=7.85, p = .005$

^a Overall MANOVA: Wilks' Lambda $F_{(6,54)}=4.105, p = .003, \eta_p^2=.283$

3.4.1.2 Social cognition

An analysis of covariance (ANCOVA) was carried out to compare overall performance on the MASC between care-leavers and non care-leavers, after controlling for level of qualifications. This revealed a significant main effect of care-leaver status ($F_{(1,62)}=9.214, p=.004, \eta_p^2=.129$). Inspection of the group means revealed significantly lower scores for care-leavers ($M=28.3, SD=4.42$) compared to non care-leavers ($M=32.4, SD=4.35$). A one-way multivariate analysis of covariance (MANCOVA) was carried out to assess the relationship between care-leaver status and ‘no TOM’, ‘reduced TOM’ and ‘excess TOM’ errors on the MASC, controlling for qualifications. A significant between groups difference was identified (Wilk’s $\lambda_{(3,60)}=3.439, p=.022, \eta_p^2=.147$). Univariate between-subjects tests found significant differences between care-leavers and non care-leavers for ‘excess TOM’ errors ($F_{(1,62)}=7.631, p=.008, \eta_p^2=.110$), but not for ‘no TOM’ errors ($F_{(1,62)}=1.212, p=.275, \eta_p^2=.019$) or for ‘reduced TOM’ errors ($F_{(1,62)}=0.934, p=.338, \eta_p^2=.015$). Inspection of the group means revealed significantly greater ‘excess TOM’ errors in care-leavers compared to non care-leavers (see Table 3.2). These findings indicate that care-leavers performed significantly worse overall on the MASC compared to non care-leavers, largely due to an increased tendency to make errors characterised by excessive mental state inferencing.

A separate MANCOVA was conducted to compare the performance of care-leavers and non care-leavers across the different mental state modalities assessed by the MASC, using total scores for the inference of other’s emotions and cognition as dependent variables. Care-leaver status was not associated with MASC scores across the different mental state modalities (Wilk’s $\lambda_{(2,58)}=2.755, p=.072, \eta_p^2=.083$). Although differences between groups were not significant, it is worth noting that the mean number of correct responses in both cognitive and emotional mental state modalities were lower in care-leavers compared to non care-leavers (See Table 3.2).

3.4.2 Mediation Analysis

Mediation analysis was carried out to determine whether the relationship between care-leaver status and difficulties with emotional regulation was mediated by social cognitive ability. Analysis was carried out as described in Section 2.5.2.

Total MASC score and erroneous social cognitive interpretations across the three error categories ('excess TOM', 'reduced TOM' and 'no TOM;') were considered as potential mediators of the relationship between care-leaver status and emotional dysregulation (total DERS score), controlling for confounding effect of qualifications. Simple non-parametric bootstrapping tests were conducted to test the significance of all potential mediators (i.e. each mediating variable was assessed individually in separate mediation analyses). This approach was favoured over a multiple-mediator model (e.g. testing all putative mediators in a combined model) as the inclusion of multiple non-significant predictors can lead to instability of regression coefficients (Hayes, 2013). The results are summarised in Table 3.7. Mediators are considered significant ($p < .05$) if the relevant 95% confidence intervals do not cross zero (Hayes, 2013).

Table 3.7 Simple mediation models of the total and indirect effects of care-leaver status on difficulties with emotional regulation through social cognition.

Mediator	Unstandardised Coefficient ^c	Bootstrap 95% CI ^d		Model R ²
		Lower	Upper	
Total Effect model^a	21.31	-	-	0.211
Simple indirect effects^b				
Total MASC score	4.77	0.89	12.32	0.254
Excess TOM	5.39	0.59	14.03	0.278
Reduced TOM	0.30	-0.90	4.94	0.212
No TOM	-0.44	-5.00	1.09	0.213

^a The total effect of care leaver status on emotional regulation after controlling for qualifications (i.e. the *c* path). ^b The simple indirect effect of care leaver status on emotional regulation through the proposed mediators (i.e. the *ab* path). ^c Unstandardised β coefficients are reported because standardisation of dichotomous variables (e.g. care leaver status) is not recommended (Hayes, 2013). ^d Bias corrected confidence intervals that include corrections for bias and skewness, based on 10,000 bootstrap samples. Mediators are considered significant ($p < .05$) if the relevant 95% confidence interval does not cross zero (Hayes, 2013).

Only Total MASC score and 'excess TOM' errors were significant mediators of the relationship between care-leaver status and total DERS score. As can be seen in Figure 3.1, whilst the indirect effect of care-leaver status through both total MASC score and 'excess TOM' were significant, the direct effect of care-leaver status on DERS remained significant (e.g. after controlling for the mediating effects of social

cognition). This indicates that social cognition, in particular the tendency to make excessive mental state inferences, *partially* (but not wholly) mediates the relationship between care-leaver status and difficulties with emotional regulation.

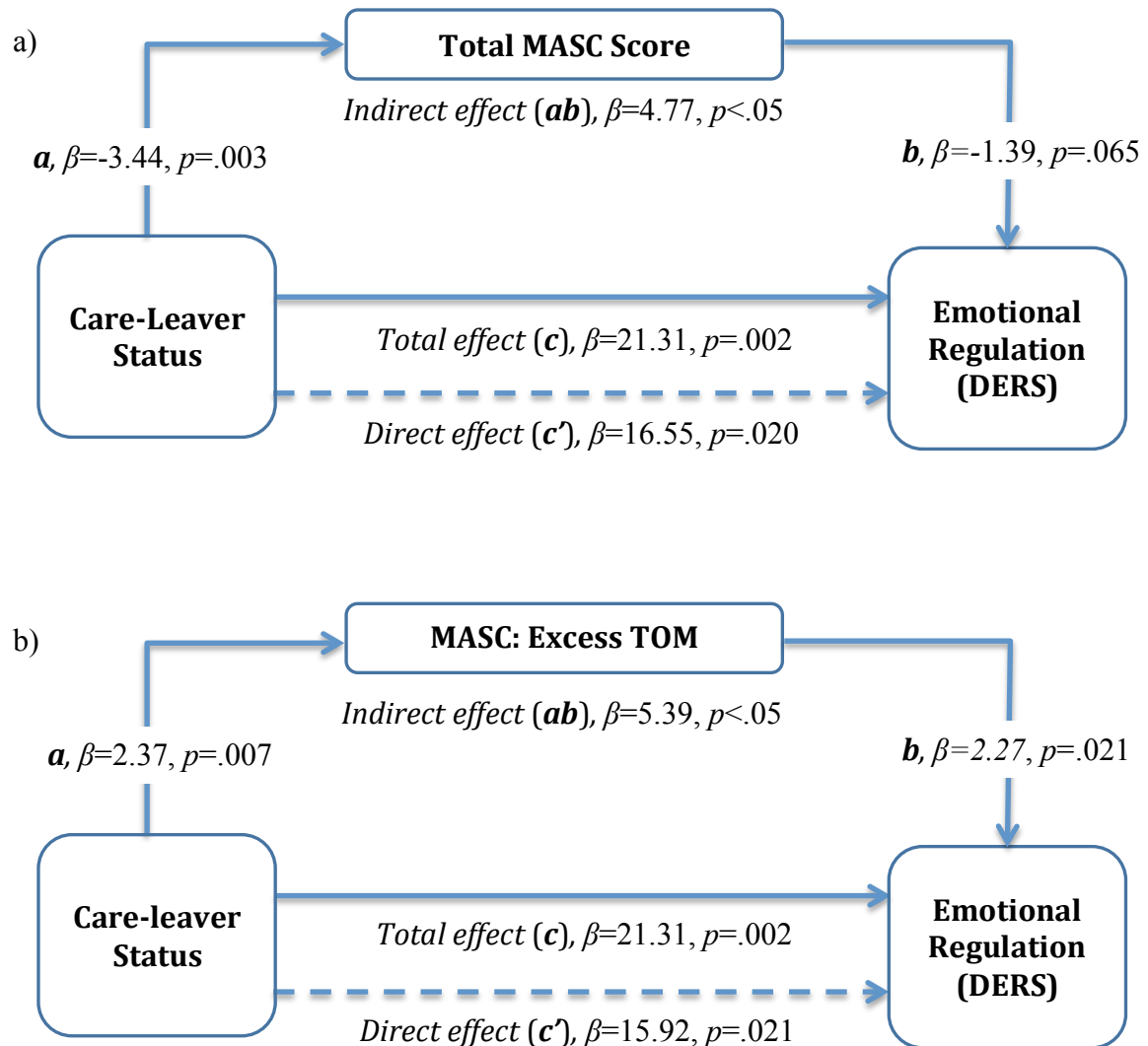


Figure 3.1. Simple mediation models of the indirect effects of care-leaver status on ‘difficulties with emotional regulation’ through a) total MASC score, and b) excess theory of mind errors (controlling for qualifications).

3.5 Romantic attachment, emotional regulation and social cognition.

The secondary aim of this thesis was to explore the relationship between adult romantic attachment style, social cognition and emotional regulation. Consistent with the mentalisation-based theoretical model for the development of psychopathology it was predicted that adult romantic attachment style would significantly predict variation in emotional regulation, and that the relationship between adult romantic attachment style and emotional regulation would be partially mediated by social cognition.

3.5.1 Attachment and care-leaver status

The mean score on the ECR-R anxiety dimension in care-leavers ($M=3.5$, $SD=1.0$) was significantly higher than in the comparison group ($M=2.8$, $SD=1.1$); $t(53)=-2.463$, $p = .017$. Likewise, the mean score on the ECR-R avoidance dimension was significantly higher in care-leavers ($M=3.2$, $SD=1.0$) compared with non care-leavers ($M=2.4$, $SD=1.0$); $t(53)=-2.855$, $p = .006$.

3.5.2 The relationship between attachment and emotional regulation

A three-step linear regression model was calculated to simultaneously test the relationship between the two adult romantic attachment dimensions and difficulties with emotional regulation (DERS). In the first step, care-leaver status was added to the model. In the second step, the two attachment dimensions of anxiety and avoidance were added simultaneously to the model. After controlling for care-leaver status, attachment anxiety ($\beta=.352$, $t_{(51)} = 2.67$, $p = .011$), but not attachment avoidance ($\beta=.083$, $t_{(51)} = 0.618$, $p = .539$), significantly predicted DERS scores. Adding the two attachment dimensions at step 2 explained approximately 14.1% of the variance in DERS scores, over and above the variation explained by care-leaver status alone ($R^2_{\text{increase}} = .141$, $F_{(2,51)}=5.549$, $p = .007$). Higher attachment anxiety was associated with elevated DERS scores. In step three, adding the two separate interaction terms (group*attachment avoidance and group*attachment anxiety), did not explain a significant proportion of the variance in DERS scores above and beyond a model testing for main effects of group, attachment anxiety and attachment avoidance ($R^2_{\text{increase}} = .035$, $F_{(2,49)}=1.388$, $p = .259$). This suggests that the

relationship between attachment and DERS scores did not differ significantly in care-leavers compared with non care-leavers.

3.5.3 *The relationship between attachment and social cognition*

Analyses analogous to those outlined in the previous section were used to test the relationship between adult romantic attachment and total MASC score. However, a binary variable contrasting those with Level 2 qualifications to those with no qualifications or Level 1 qualifications was added to the model, in addition to care-leaver status, at step 1. The inclusion of the two attachment dimensions significantly improved the predication of MASC total score, compared to a regression model including care-leaver status and qualifications ($R^2_{\text{increase}} = .079$, $F_{(2,50)}=3.313$, $p = .045$). In the combined model, neither ECR-R attachment anxiety ($\beta=-.202$, $t_{(50)}=1.559$, $p = .125$), nor ECR-R attachment avoidance ($\beta=.150$, $t_{(50)}=-1.130$, $p = .264$) were associated with MASC total scores. Likewise, the two attachment * group interaction terms at Step 3 were not significantly associated with MASC total scores, suggesting that the relationship between the ECR-R attachment dimensions and MASC total score was similar in care-leavers and non care-leaver groups.

Multivariate multiple regression was used to assess the relationship between adult romantic attachment and ‘no TOM’, ‘reduced TOM’ and ‘excess TOM’ errors on the MASC, after controlling for care-leaver status and qualifications. A significant multivariable effect was identified for attachment anxiety (Wilk’s $\lambda(3,48)=2.833$, $p=.048$), but not attachment avoidance (Wilk’s $\lambda(3,48)=1.498$, $p = .227$). Separate linear regression models for each of the MASC error categories revealed that attachment anxiety was significantly associated with ‘excess TOM’ errors ($\beta=.349$, $t_{(50)} = 2.486$, $p = .016$), but not ‘reduced TOM’ ($\beta=.088$, $t_{(50)} = 0.579$, $p = .565$) or ‘no TOM’ errors ($\beta=-.214$, $t_{(50)} = -1.395$, $p = .169$) after controlling for care-leaver status and qualifications. Higher attachment anxiety was associated with elevated excess TOM errors, suggesting that those with preoccupied or fearful attachment styles are more likely to over-interpret mental state inferences than those with secure or dismissing adult attachment styles. Adding two separate group interaction terms (group*attachment avoidance and group*attachment anxiety) did not explain a significant proportion of the variance in ‘excess TOM’ scores above and beyond a model testing for main effects of qualifications, group, attachment anxiety and

attachment avoidance ($R^2_{\text{increase}} = .033$, $F_{(2,48)}=1.178$, $p = .317$). This suggests that the relationship between attachment and ‘excess TOM’ errors on the MASC did not differ significantly in care-leavers compared with non care-leavers.

A separate multivariate multiple regression was conducted to explore the relationship between the two attachment dimensions and the different mental state modalities assessed by the MASC. Total scores for inferences of others’ cognitive and emotional states of mind were included as dependent variables. Care-leaver status and qualification were entered into the model as covariates. Attachment anxiety (Wilk’s $\lambda_{(2,49)}=2.346$, $p=.106$) and attachment avoidance (Wilk’s $\lambda_{(2,49)}=0.255$, $p=.776$), were not significantly associated with MASC performance when separated by mental state modality.

3.5.4 Mediation Analysis

Analyses in the previous section identified a significant relationship between adult romantic attachment anxiety and difficulties with emotional regulation and ‘excess TOM’ errors on the MASC. Mediation analysis was conducted to determine whether the relationship between romantic attachment anxiety and difficulties with emotional regulation was mediated by the tendency to make erroneous mental state inferences. Analysis was carried out as described in Section 2.5.2. Total MASC score and erroneous social cognitive interpretations across the three error categories (‘excess TOM’, ‘reduced TOM’ and ‘no TOM;’) were considered as potential mediators of the relationship between adult romantic attachment anxiety and emotional dysregulation (total DERS score), controlling for the confounding effects of care-leaver status and qualifications. Simple non-parametric bootstrapping tests were conducted to test the significance of all potential mediators (i.e. each mediating variable was assessed individually in separate mediation analyses), after controlling for the effect of care-leaver status on the mediator variable and the DERS total score. As can be seen in Table 3.8, none of the social cognitive variables were significant mediators of the relationship between adult romantic attachment anxiety and total DERS score ($p > .05$).

Table 3.8 Simple mediation models of the total and indirect effects of adult romantic attachment anxiety on difficulties with emotional regulation through social cognition.

Mediator	Unstandardised Coefficient ^c	Bootstrap 95% CI ^d		Model R ²
		Lower	Upper	
Total Effect model^a	10.11	-	-	0.405
Simple indirect effects^b				
Total MASC score	0.92	-0.61	3.97	0.415
Excess TOM	0.77	-1.51	3.39	0.410
Reduced TOM	0.14	-0.49	2.07	0.406
No TOM	-0.07	-1.93	0.58	0.406

^a The total effect of adult romantic attachment anxiety on emotional regulation after controlling for care-leaver status and qualifications (i.e. the *C* path). ^b The simple indirect effect of adult romantic attachment anxiety on emotional regulation through the proposed mediators (i.e. the *ab* path). ^c Unstandardised β coefficients are reported because standardisation of dichotomous variables (e.g. care leaver status) is not recommended (Hayes, 2013). ^d Bias corrected confidence intervals that include corrections for bias and skewness, based on 10,000 bootstrap samples. Mediators are considered significant ($p < .05$) if the relevant 95% confidence interval does not cross zero (Hayes, 2013).

Chapter Four

Discussion

4.1 Summary of the main study findings

This is the first study to investigate theory of mind in care leavers using an ecologically valid measure of social cognition. As hypothesised, young people who have spent time in care were found to have greater impairments in social cognition, compared with demographically matched young people raised by their birth parents. Specifically, care-leavers showed a tendency to make overly complex inferences based on social cues. In contrast, care-leavers and non care-leavers did not differ in their tendency to make errors associated with loss of theory of mind capacity (e.g. ‘No TOM’ or reduced ‘TOM errors’). This suggests that rather than lacking theory of mind, young people leaving care are more likely to utilise alternate strategies that increase the likelihood that they will over-interpret social signs. This finding, in a group at high risk of experiencing psychological problems, adds to the growing body of evidence linking social cognitive deficits to mental health problems.

As hypothesised, this study found that care-leavers reported more difficulties with emotional regulation, compared with young people raised by their birth parents. Difficulties were more apparent in care-leavers across various aspects of emotional regulation. In particular, care-leavers were more likely to report a lack of clarity about their feelings, had less access to emotional regulation strategies and expressed more difficulties remaining in control of their emotions and engaging in goal directed behaviour when experiencing negative emotions. The relationship between care-leaver status and emotional regulation was partially mediated by social cognition, in particular the tendency to make over-interpretative mental state inferences. Whilst the cross-sectional nature of this study does not allow us to draw firm causal conclusions, these data are consistent with the mentalisation-based model and suggest that the tendency to over-interpret social signs in relational contexts might give rise to strong emotions that are difficult to control. It is notable that whilst this study found a

significant indirect effect of care-leaver status on emotional regulation through social cognition, only evidence for partial mediation was observed. Thus, other unmeasured factors are likely to be important in explaining the relationship between experiencing local authority care and subsequent difficulties with emotional regulation.

This study also investigated the relationships between adult romantic attachment, social cognition and emotional dysregulation. Care-leavers were found to have significantly higher levels of attachment anxiety and attachment avoidance than young people raised by their birth parents. This indicates that, compared to demographically matched young people raised by their birth families, young people leaving the care system are more likely to hold negative ‘internal working models’ of both themselves and others. In accordance with the study hypotheses, adult romantic attachment style significantly predicted variation in emotional regulation. Attachment anxiety, but not attachment avoidance, was associated with greater difficulties with emotional regulation. With respect to Bartholomew’s attachment prototypes this suggests that highly preoccupied and fearful people (i.e. people on the high end of the anxiety dimension) perceive themselves as having greater difficulties with emotional regulation than highly secure and dismissing people (i.e. people on the low end of the anxiety dimension). It was hypothesised that adult romantic attachment style would significantly predict variation in social cognition. Some support for this hypothesis was found. A significant association was found between attachment anxiety, but not attachment avoidance, and the tendency to make over-interpretative mental state inferences on the MASC (e.g. ‘excess TOM’ errors). This suggests that highly preoccupied and fearful people are more likely to over-interpret social signs in interpersonal contexts than highly secure and dismissing individuals. Finally, it was hypothesised that social cognition would mediate the relationship between attachment and emotional regulation. No support for this hypothesis was found, suggesting that the relationship between attachment and emotional regulation may be governed by factors independent of social cognition.

Separate analyses were conducted to examine mental state inferences in relation to either the emotional or cognitive mental states of characters in the MASC task. These analyses did not identify significant differences when comparing care-leavers and non

care-leavers. Likewise, cognitive and emotional mental state inferences were not associated with adult attachment style when analysed separately.

4.2 Main study findings and their relation to past research

4.2.1 *Social cognition in care-leavers*

This study is the first to demonstrate impairments in social cognition in young people leaving the public care system. Importantly, these deficits were identified using a task that resembled the demands of everyday-life social cognition (Dziobek *et al.*, 2006a), and allowed for stylistic dysfunctions of mentalising to be analysed separately (e.g. inferences characterised by lack of TOM, reduced TOM or excess TOM). Rather than lacking theory of mind capacity, care-leavers were shown to have developed alternate social cognitive strategies that made them more likely to over-interpret social information in interpersonal contexts.

No comparable research has focused on social cognition amongst care-leavers. Some studies have demonstrated that looked after children (Barone & Lionetti, 2012a; Lewis-Morrarty *et al.*, 2012; Pears & Fisher, 2005) and those who have experienced early trauma (see Section 1.7.6.1) present with deficits in social cognitive abilities. These studies have typically used classical measures of theory of mind, which are most suited to detecting the presence or absence of social cognitive abilities. However, there is evidence that children and adolescents who have been maltreated are more likely to make hostile attributions of peers' behaviour (Price & Glad, 2003) and interpret facial expressions as angry or fearful (Leist & Dadds, 2009; Masten *et al.*, 2008; Pollak *et al.*, 2000). These biases in information processing have some parallels with the tendency to make *overly* complex mental state inferences identified among care-leavers in the current study. For example, misinterpretation of the external features of others may increase the tendency to make over-interpretative inferences about their emotions, thoughts and intentions. However, further research is required to elucidate the links between specific aspects of social information processing and 'real life' social cognition. In addition, the majority of this research has been carried out with young children. Comparing young adults with those in childhood is problematic given the profound changes that occur in the brain regions thought to be responsible for social cognition through childhood and adolescence

(Blakemore, 2008a, 2008b; Blakemore *et al.*, 2007). A previous study using the MASC identified more pronounced deficits in social cognition among adults diagnosed with borderline personality who presented with post-traumatic stress disorder (Preisler *et al.*, 2010). In particular, greater impairments in social cognition were noted amongst those who had experienced ‘sexual assault by a known assailant’. Similarly, women with PTSD related to childhood abuse have been shown to have deficits in the recognition of complex mental states from emotionally salient facial expressions (Nazarov *et al.*, 2014). These findings lend some support to theoretical predictions that past trauma interferes with the capacity to ‘mentalise’ (Fonagy, 1989; Fonagy, 1991) and could help explain the finding of impaired social cognition among care-leavers – a group who have experienced disproportionately high levels of early trauma compared to those in the general population.

Care-leavers are at high risk of experiencing psychological difficulties and, as identified in this study, are more likely to have difficulties with emotional regulation than young people raised by their birth parents. As such, it is appropriate to compare the findings from this study with other studies that have investigated social cognition in clinical groups. As described in Section 1.7, there is evidence that a broad range of mental health problems are associated with differential performance on the MASC. Care-leavers in this study were more likely to make over-interpretative mental state inferences. Similar findings have been reported in individuals diagnosed with borderline personality disorder (Sharp *et al.*, 2013; Sharp *et al.*, 2011b), persistent somatoform pain disorder (Schönenberg *et al.*, 2014), as well as amongst dependent cocaine users (Preller *et al.*, 2013). This pattern of results is interesting in the context of the findings of the current study. In particular, there is growing evidence that excessive interpretation of the mental states of others seems to be more common in groups with prominent difficulties with emotional regulation. In contrast, this study found no evidence that care-leavers are more likely to make ‘reduced TOM’ or ‘no TOM’ errors, which contrasts with studies that have utilised the MASC to assess social cognition in individuals with ‘mood disorders’ (Montag *et al.*, 2010; Wolkenstein *et al.*, 2011).

The findings from the current study are inconsistent with studies that have noted superior or ‘intact’ social cognition in those presenting with difficulties with

emotional regulation (see Roepke *et al.* (2013) for a review). However, the majority of these studies utilised measures of social cognition that focus on recognition of facial affect (Domes *et al.*, 2009; Fertuck *et al.*, 2009; Schilling *et al.*, 2012b) or which lack ecological validity (Arntz *et al.*, 2009; Dziobek *et al.*, 2006a; Ghiassi *et al.*, 2010; Roepke *et al.*, 2013). The current study utilised the MASC, which has higher ecological validity (Dziobek *et al.*, 2006a) and is sensitive to qualitatively different inferences in relation to the mental state of others. The findings from the current study are consistent with a wealth of research that suggests that rather than *lacking* social cognitive abilities, those with problems regulating their emotions (e.g. those often diagnosed with borderline personality disorder) present with qualitative differences in how they process social information (Arntz & Ten Haaf, 2012; Barnow *et al.*, 2009; Fertuck *et al.*, 2009; Franzen *et al.*, 2011; Preisler *et al.*, 2010; Ritter *et al.*, 2011; Roepke *et al.*, 2013; Veen & Arntz, 2000).

The current study did not identify significant differences between care-leavers and non care-leavers when looking specifically at cognitive and emotional mental state reasoning. It is thought that the abilities to infer the cognitive and emotional mental states of others represent distinct but overlapping components of social cognition (Blair, 2005; Decety & Meyer, 2008; Singer, 2006). The findings from the current study contrast with previous research that has found that those meeting diagnostic criteria for a range of psychiatric diagnoses differ in their ability to process the cognitive and emotional mental states of others. For example, those with borderline personality disorder (Preisler *et al.*, 2010; Ritter *et al.*, 2011) and bipolar disorder (Montag *et al.*, 2011) have been shown to have more pronounced deficits in cognitive, rather than emotional, mental state reasoning, whereas the opposite was found to be true amongst those with persistent somatoform pain disorder (Schönenberg *et al.*, 2014). In the current study, between-group comparisons of different mental state modalities approached statistical significance, which suggests that the failure to identify differences when looking specifically at cognitive and emotional mental state reasoning might represent issues with statistical power in the current study.

Another striking finding from this study was the relative poor performance of both the care-leaver and non care-leaver groups when compared to published data. Overall performance on the MASC amongst care-leavers was significantly worse than a group

of adolescent inpatients and cocaine users, as well as of groups meeting diagnostic criteria for depression, bipolar affective disorder and narcissistic personality disorder. Care-leavers' performance was comparable to that of clinical groups meeting diagnostic criteria for borderline personality disorder, paranoid schizophrenia and somatoform pain disorder. Likewise, the average MASC total score among young people in the comparison group was significantly worse than that found for several other 'control' groups assessed in previous research studies. It is unclear to what extent this relatively poor performance is due to the complex psychological needs of the population in this study, generational effects, cultural influences, socioeconomic factors and/or the emerging development of social cognitive capacity through adolescence and into early adulthood. Most previous studies that have utilised the MASC to measure social cognition in relation to psychological difficulties have recruited groups with a mean age above 30 years of age. This contrasts with the young adults included in this study. This difference may partially account for the relatively poor performance on the MASC observed in the current study. It is well recognised that the late teens through the early twenties are years of profound change and personal growth (Arnett, 2007). We are only just starting to understand the complexities of the normal development of social cognition through this period (Miller, 2012), but the available evidence suggests that adolescence and early adulthood represents a critical period for the development of brain areas thought to influence social cognition (Blakemore, 2008a, 2008b; Blakemore *et al.*, 2007). Correspondingly, there is evidence from a number of studies that social cognitive ability improves through adolescence and early adulthood (Dumontheil *et al.*, 2010; Mestre *et al.*, 2009).

4.2.2 *Emotional regulation in care-leavers*

This study found evidence that young people leaving the care-system reported significantly greater difficulties with emotional regulation compared with young people raised by their birth parents. There is a relative paucity of research that has sought to characterise psychological difficulties in young people leaving the care system. However, it is well recognised that looked after children are at greater risk of experiencing psychological problems (Ford *et al.*, 2007) and longitudinal studies suggest that this vulnerability extends into adulthood (Buchanan *et al.*, 2000; Cheung & Buchanan, 1997; Power *et al.*, 2002). The findings from the current study suggest

that the complex psychological problems experienced by looked after children and young people leaving care (Andrew *et al.*, 2013; Ford *et al.*, 2007; Tarren-Sweeney, 2008), may in part be underpinned by difficulties with emotional regulation.

The current research tells us little about the factors that cause emotional regulation difficulties in this population. However, it seems likely that a combination of experiences prior to, during and transitioning from care interfere with the capacity to develop adaptive skills in emotional regulation. The mentalisation based model, as well as many other psychological orientations, highlight the importance of early attachment relationships, as well as the negative impact of trauma, on the development of effective strategies to regulate emotions (Fonagy, 1989; Fonagy, 1991; Hughes, 2004; Linehan *et al.*, 1991). Sadly, the majority of children coming into care have experienced trauma and disturbances in early attachment relationships and these are often perpetuated by frequent placement changes and ongoing difficulties in care (Andrew *et al.*, 2013; Shook *et al.*, 2011). These factors are likely to play an important part in explaining difficulties with emotional regulation observed among care-leavers in the current study. It is also possible that the transition from care itself might be interpreted as overwhelming by some – which could lead to perceived difficulties regulating emotions. Indeed, previous studies have reported a worsening of psychological difficulties and an increase in maladaptive coping strategies (e.g. substance misuse) among young people in the first 12-15 months after they leave the care system (Dixon, 2008; Ward *et al.*, 2003). In the current study insufficient information was obtained about care-leaver's past experiences to test the relationship between prior abuse and neglect, experiences in care and emotional regulation.

4.2.3 Adult romantic attachment in care-leavers

This study found that care-leavers had higher levels of attachment anxiety and attachment avoidance in romantic relationships than young people raised by their birth parents. This contrasts with a previous study in this population, which found similar mean scores across the two attachment dimensions when comparing care-leavers with demographically matched non care-leavers. Paull (2013) reported higher mean scores across both attachment dimensions in her comparison group compared with non care-leavers in the current study. The reasons for this difference are not

clear. The current study recruited non care-leavers from the same population as the study by Paull (2013) and a comparison of the demographic characteristics indicates that the two studies included non care-leavers with similar profiles in terms of gender, age, living arrangements and educational qualifications. One difference is that the earlier study included a higher proportion of non care-leavers who had received therapy (37.2%), compared with the current study (25.7%). This might indicate that there were more attachment-related psychological difficulties among non care-leavers in the study by Paull (2013). The mean scores across the two attachment dimensions amongst non care-leavers in the current study were comparable with other studies which have utilised the ECR-R to measure romantic attachment style in young adults recruited from the general population (Bosmans *et al.*, 2010; Fraley *et al.*, 2011).

Findings from the current study are consistent with research that has demonstrated that former adoptees tend to have less secure attachment styles as adults (Borders *et al.*, 2000; Feeney *et al.*, 2007). Finding of high levels of attachment insecurity in care-leavers is also consistent with conclusions from the meta-analysis by Van Den Dries *et al.* (2009) that reported fewer secure attachments and more disorganised attachments in fostered and adopted children, compared to children raised by their birth families. However, it is important to recognise that the measure of adult romantic relationship used in the current study differs from the measures of infant attachment utilised in the studies included in the meta-analysis by Van Den Dries *et al.* (2009). Furthermore, elevated attachment anxiety and avoidance in adult romantic relationships isn't necessarily an indicator of attachment styles in other relationships (Baldwin *et al.*, 1996). Likewise, research that questions the continuity of attachment style over time, especially amongst those who experience difficult life events (Lewis *et al.*, 2000; Weinfield *et al.*, 2000), cautions against assuming that anxious and avoidant attachment styles in adulthood reflect earlier attachment representations.

Finally, it is important to note that, despite the statistical significance of the associations, care-leaver status only explained 16% of the variance in attachment. This suggests that other factors, not captured by comparing care-leavers with non care-leavers, were important in forming the internal working models of self and others that underpin adult romantic attachment type. For example, experiences of secure attachment relationships in care (Dozier *et al.*, 2001; Pace & Zavattini, 2011; Steele *et*

al., 2008) and adoptive parent bond (Feeney *et al.*, 2007) have been shown to be important predictors of attachment in young people who have spent time in care. Additionally, the measure of adult romantic attachment used in the current study is likely to be sensitive to recent relationship events (Feeney *et al.*, 2007), which in part will be governed by the behaviour of the young person's romantic partner (Kobak & Madsen, 2008).

4.2.4 *Adult romantic attachment and emotional regulation*

This study found that higher attachment anxiety, but not attachment avoidance, was associated with greater difficulties with emotional regulation. This indicates that those who are highly preoccupied and fearful within adult romantic relationships perceive themselves as having greater difficulties with emotional regulation than highly secure and dismissive individuals. A care-leaver group interaction was not significant, suggesting that the relationship between attachment and emotional regulation is similar for care-leavers and non-care leavers. A possible explanation is that those with negative internal working models of themselves (e.g. those that score highly on the attachment anxiety dimension) feel unable to handle their own negative emotions and need others to resolve their stress. This low perceived self-efficacy, could lead to hyper-vigilant screening of the environment and/or preoccupation with the availability of attachment figures – which leads to overwhelming negative emotions (Brenning & Braet, 2013).

The association between attachment anxiety and difficulties with emotional regulation is consistent with a wealth of research that indicates that attachment insecurity is more common among adults with a range of psychological problems characterised by emotional dysregulation (Van Ijzendoorn & Bakermans-Kranenburg, 2008).

Likewise, it is consistent with a range of studies, in both children and adults, which have directly tested the relationship between attachment and emotional regulation. Previous research with children has found that parent-child attachment is associated with factors that affect emotional regulation in children, including lower cortisol reactivity (Nachmias *et al.*, 1996), positive anger management strategies (Gilliom *et al.*, 2002) and more adaptive responses to stress (Contreras *et al.*, 2000; Roque *et al.*, 2013). Similarly, stylistic ways of regulating affect have been identified in adults that are particular to specific attachment styles. For example, those with insecure

attachments have been shown to over react to negative feelings and to seek the support of others, whereas those who score higher on measures of attachment avoidance suppress their negative feelings and attempt to maximise their distance from others (Brenning & Braet, 2013; Fuendeling, 1998; Wei *et al.*, 2005).

Attachment avoidance was not associated with emotional dysregulation. There are a number of possible explanations for this finding. First, it is possible that those with negative internal working models of others do not perceive themselves as having difficulties with emotional regulation because they value self-reliance, are reluctant to disclose difficulties and are engaged in defensive strategies which promote the ‘idealised self’ (Simard *et al.*, 2011; Wei *et al.*, 2007). In line with this prediction, previous studies have found that those with avoidant attachment styles are less likely to admit ‘self-imperfections’ (Cassidy, 1988). Second, the lack of association might, in part, be due to the fact that the measure of emotional regulation used in this study (i.e. the DERS) is more heavily weighted toward reactive, rather than suppressive, emotional regulation strategies. People who are avoidantly attached are thought to be more likely to use deactivating emotional regulation strategies (e.g. denial), which are less likely to elicit the attention of others, most probably because they have learned that attachment behaviour leads to rejection, punishment or anger instead of comfort (Brenning & Braet, 2013).

4.2.5 *Adult romantic attachment and social cognition*

This study is the first to test the relationship between attachment and an ecologically valid measure of social cognition. According to attachment theory and the mentalisation-based theoretical model for the development of psychopathology, social cognition emerges within the context of attachment relationships (Bowlby, 1969; Fonagy & Bateman, 2008). Fonagy *et al.* (1991) propose that the parent’s capacity to observe and reflect on their child’s mind, within the context of secure attachment relationships, facilitates the child’s general understanding of minds (e.g. social cognition). Likewise, internal working models of self and others are thought to form the basis of future unconscious and automatic inferences about the mental states of others (Bowlby, 1980). As such, we might expect to observe a relationship between adult attachment style and social cognition. This study found that attachment anxiety, but not attachment avoidance, was associated with a greater tendency to make over-

interpretative mental state inferences. Contrary to predictions, interaction analysis indicated that the relationship between attachment and social cognition is similar in care-leavers and non care-leavers. Whilst the cross sectional nature of this study tells us little about causality, it seems plausible that the relationship between attachment and social cognition is transactional. For example, those with high levels of attachment anxiety are likely to be more vigilant to threat and negative stimuli in interpersonal contexts which could result in them making over-interpretative inferences about the mental states of others. This in turn is likely to give rise to further attachment anxiety (e.g. misinterpreting benign social interactions as negative, or signs of impending rejection, is likely to heighten attachment anxiety).

The observed association between adult romantic attachment anxiety and over-interpretative mental state inferences is consistent with previous studies that have shown that those with insecure attachments process social information differently to securely attached adults. In particular, previous research has shown that those with insecure attachment representations are primed to attend to and more readily recall negative social stimuli (Atkinson *et al.*, 2009; Maier *et al.*, 2005; Sutin & Gillath, 2009; Zeijlmans Van Emmichoven *et al.*, 2003), as well as being overly attuned to emotional information (Dewitte *et al.*, 2007). Whilst these studies have generally focused on individual facets of social cognition, there are some parallels with the findings from the current study – for example, it seems reasonable to hypothesise that hypersensitivity to negative stimuli might increase the likelihood of making over-interpretative mental state inferences. The finding that attachment anxiety, but not avoidance, is related to social cognitive ability is inconsistent with the studies by MacBeth *et al.* (2011) and Korver-Nieberg *et al.* (2013). The former found that attachment avoidance, rather than anxiety, was associated with lower ‘mentalisation skills’. However, this study was carried out in the context of first-episode psychosis and utilised an interview-based measure of reflective functioning to index mentalisation, which differs markedly from the measure of social cognition used in the current study. The study by Korver-Nieberg *et al.* (2013) did not find an association between attachment and theory of mind (Korver-Nieberg *et al.*, 2013). However, they utilised a ‘perspective taking’ task in relation to what another person can and cannot see, which has little comparability with the MASC.

4.3 Methodological strengths and limitations

4.3.1 Strengths

A major strength of this study is the use of an ecologically valid measure of social cognition. Firstly, because it more closely approximates the demands of every day social situations than experimental or laboratory paradigms that have typically been used to study social cognition. Secondly, it allows for the interpretation of social cognition within a context that is allowed to develop over a period of time, utilising dynamic stimuli (e.g. video). This contrasts with measures such as the Reading the Mind in the Eyes test, which present static images, or the Moral Dilemmas task, which presents isolated video clips with little context. Third, the MASC allows for the analysis of qualitatively different variations in mental perspective taking (e.g. ‘No TOM’, ‘reduced TOM’ and ‘excess TOM’ errors), rather than relying on dichotomous ‘right or wrong’ response keys which have proved useful in identifying theory of mind deficits in those with Autistic Spectrum Conditions (Dziobek *et al.*, 2006b). In the current study, neither a complete lack of TOM, nor ‘reduced’ mental state attribution was associated with care-leaver status or adult romantic attachment. By contrast, ‘excess TOM’ errors were associated with both care-leaver status and adult romantic attachment anxiety. This finding underscores the utility of analysing qualitative differences in social cognition rather than focusing purely on the presence or absence of theory of mind.

An additional strength of this research is that it focused primarily on psychological constructs rather than psychiatric diagnoses. The use of psychiatric diagnosis often gives rise to substantial clinical heterogeneity among groups (Zimmerman *et al.*, 2012), the diagnostic process can lack reliability (Zimmerman *et al.*, 2010) and people with one diagnosis are often characterised by high levels of comorbidity (Grant *et al.*, 2008). This can make it difficult to interpret results and tells us little about the relationship between social cognition and specific difficulties that contribute to diagnosis. For example, there is evidence that social cognitive difficulties are more common among those with borderline personality disorder. However, these studies tells us little about the relationship between mental state reasoning and difficulties in

interpersonal relationships, fears of abandonment or emotional regulation – all of which feature in the diagnostic criteria for BPD (World Health Organisation, 1992). Deconstructing psychiatric diagnosis and focusing on more precisely defined quantitative traits – or psychological ‘endophenotypes’ – is likely to yield more fruitful and valid associations (Panksepp, 2006), which are useful for understanding the precipitating and perpetuating factors for psychological and emotional problems (Coghill & Sonuga-Barke, 2012).

4.3.2 *Limitations*

4.3.2.1 *Population*

Convenience sampling was used to recruit both care-leavers and non care-leavers, which has the potential to introduce bias and limits the generalisability of the findings to other populations. Only four individuals identified by leaving care teams did not take part in the study – either because they declined consent or could not find a suitable time to meet with the researcher. This alleviates some concerns about recruitment bias. In addition, leaving care teams were asked to provide all young people on their caseloads with equal opportunity to participate in this research. However, it is possible that teams disproportionately ‘screened out’ individuals they felt were unlikely to consent to taking part in the research, perhaps those with more complex social, emotional and psychological needs. As such, it is unclear how representative the current sample is of the general population of young people leaving care. Finally, a large proportion of care leavers had received therapy and several had been enrolled in an intensive intervention based on dialectical behavioural therapy and dyadic developmental psychotherapy– an attachment-based model which targets emotional regulation and social cognition (see Andrew *et al.*, 2013). We might expect that care-leavers would have greater difficulties with attachment, emotional regulation and social cognition before commencing this intervention. As such, the current study could underestimate the psychological and attachment difficulties experienced by young people leaving care. Non care-leavers were approached through a local college and only those willing to give up their time were included in the research – which could have introduced bias. Anecdotally, very few young people approached through the college declined the opportunity to take part in the study and that those that did most commonly cited a lack of time between academic commitments. High rates of

participation reduce the likelihood of introducing systematic bias (Altman & Bland, 2007). Furthermore, mean scores amongst non care-leavers on the ECR-R and DERS were comparable with previously published data from similarly aged cohorts.

Other limitations preclude the generalisability of these findings to other samples. First, individuals were required to have a certain level of cognitive functioning to complete the research measures. Second, the study lacked a comprehensive measure of socioeconomic status. Third, participants predominantly described themselves as ‘White British’. As such, it is unclear how these results generalise to individuals with lower levels of functioning, other socioeconomic groups and more diverse ethnic backgrounds.

Finally, the analysis of the ECR-R data was restricted to a subset of the complete sample who reported experience of a close romantic relationship. As such, the findings in relation to attachment are not representative of young people in general. Whilst it seems important not to pathologise being ‘single’, there is evidence to suggest that attachment style impacts on partner preference and the likelihood of engaging in romantic relationships (Holmes & Johnson, 2009). As such, we might expect differences in attachment style when comparing young adults who have and have not entered into a close relationship with another.

4.3.2.2 Methodological

The cross-sectional design of this study does not allow us to draw any causal conclusions. The mentalisation model predicts that childhood adversity and attachment disturbances interfere with the capacity to infer the mental states of both ourselves and others, which in turn can lead to difficulties with emotional regulation which manifest as problems commonly recognised as ‘psychiatric disorders’ (Fonagy, 1989). Mediation analyses in this study demonstrated that impairments in social cognition, in particular the tendency to make overly interpretative mental state inferences, explained a significant amount of the variance in the relationship between requiring local authority care (an indicator of childhood adversity) and emotional regulation. Whilst this finding is consistent with the mentalisation model, causal relationships can be inferred with greater confidence if they are shown to develop

within the context of longitudinal studies. Unfortunately, no such studies have been reported. It is equally plausible that difficulties with emotional regulation cause alterations in social cognitive performance (e.g. over-interpretation of one's own emotional reactions lead to misattribution of the mental states of others; Hay, 2014). In fact, there is evidence that emotional arousal affects our ability to infer the mental state of others (Smeets *et al.*, 2009). Alternatively, the relationship between social cognition and emotional regulation may be bi-directional. A similar argument can be made in relation to attachment style and social cognition. Within the attachment literature it is generally assumed that attachment style influences social cognition (Dykas & Cassidy, 2011). However, some have pointed out that the ability to infer the mental states of oneself and others is likely to influence the development of experienced-based 'internal working models' of attachment relationships (Hunefeldt *et al.*, 2013).

Another weakness of this study is that it fails to adequately account for 'state' and 'trait' aspects of social cognition. It has long been recognised that those with difficulties with emotional regulation demonstrate unimpaired or enhanced social cognition (e.g. Fertuck *et al.*, 2009; Frank & Hoffman, 1986; Franzen *et al.*, 2011), in spite of impaired interpersonal functioning (Hill *et al.*, 2008b; Linehan, 1993b). This is sometimes termed 'Krohn's Paradox' (Krohn, 1974). The mentalisation model accounts for this by proposing that the capacity to 'mentalise' varies in relation to emotional arousal and interpersonal context. Physiological responses to stress (e.g. the fight, flight or freeze response) are thought to lead to a switch from cortical to subcortical mentalising, which inhibits explicit, controlled and conscious forms of processing, in favour of implicit and automatic processing (Fonagy & Luyten, 2009; Lieberman, 2007; Mayes, 2000). Activation of the attachment system can lead to high states of arousal (Fonagy & Bateman, 2006), especially amongst those who have experienced early neglect and maltreatment (Fonagy & Luyten, 2009). As such, we might expect deficits in social cognition to be most pronounced at times of emotional arousal or activation of the attachment system (Sharp *et al.*, 2013). At these times, social information may become amplified and distorted towards negative, self-referential emotional states. In fact, one study has utilised the MASC to demonstrate that stress leads to the differential processing of social information (Smeets *et al.*, 2009). The current study perhaps most accurately measures 'trait' level variation in

social cognition. Even though the MASC closely approximates ‘real life’ social cognition (Sharp *et al.*, 2013), it is unclear to what extent participants’ performance was influenced by stress and emotionally mediated deactivation of controlled, conscious mental state interpretations (e.g. ‘state’ level variation in social cognition). Further research should explore how variation in social cognition interacts with emotional arousal and regulation of the attachment system.

4.3.2.3 Measures

The reliance on self-report to measure emotional regulation and attachment can be problematic. With regard to emotional regulation, individuals may not always be consciously aware of their own use of emotional regulation strategies in stressful situations and their reporting may be impacted by memory biases. Furthermore, there is some evidence that young people self-report greater difficulties than informants (Hourigan *et al.*, 2011; Sharp *et al.*, 2011a). Within the child and adolescent literature it is generally recommended that researchers obtain information using multiple methods (e.g., questionnaire, observation) and from multiple informants (e.g. child and parent; Cicchetti *et al.*, 1995; Zeman *et al.*, 2007). However, the use of similar strategies is not necessarily appropriate when studying young adults, especially amongst those raised in care. Similarly, self-report measures of attachment have been criticised for being subject to response bias, especially in the context of attachment related defences (George & West, 2001). However, both the ECR-R and DERS have been shown to be appropriate for use with young adults (e.g. Sharp *et al.*, 2011b; Simard *et al.*, 2011) and have demonstrated good convergent and predictive validity (e.g. Gratz *et al.*, 2008; Neumann *et al.*, 2010; Sibley *et al.*, 2005). The ECR-R has also proved useful in testing and confirming fundamental predictions of attachment theory (Ravitz *et al.*, 2010).

The Movie for the Assessment of Social Cognition is generally well regarded as a ‘state of the art’, ecologically valid measure of social cognition (Achim *et al.*, 2013). However, it does have some limitations. First, it does not adequately allow for differential analysis according to emotional valence. For example, we might expect individuals with attachment-related psychological difficulties to be primed to negative emotions (e.g. anger, fear) in others and to under-recognise positive emotions (e.g. joy, pride, love), as shown in studies using other measures of social cognition (e.g.

Barnow *et al.*, 2009; Brenning & Braet, 2013). Second, it doesn't allow researchers to accurately delineate the sources of information used to make mental state attributions (e.g. perceptual or linguistic information; Achim *et al.*, 2013). In future, researchers might seek to develop ecologically valid measures of social cognition that address these limitations.

4.3.2.4 *Confounding variables*

Rigorous sample matching and statistical controls were employed to reduce the confounding effects of gender, age and education. However, it is possible that other unmeasured variables might have impacted on the results, most notably prescription medication and illicit drug use and general intelligence. Data were not available about medication use. As noted in Section 1.7.5, the impact of medication on social cognition is controversial (Kucharska-Pietura & Mortimer, 2013; Sergi *et al.*, 2007). Drugs modulating different neurotransmitter systems might also affect distinct aspects of social cognition (Montag *et al.*, 2008). However, the limited data available suggests that medication use has little or no impact on performance on the MASC (Montag *et al.*, 2011; Preisler *et al.*, 2010) and the prevalence of prescription psychoactive medication in the current population is likely to be low (e.g. none of the 17 care-leavers recruited through the Action for Children 'Skills for Living' program were taking psychotropic medication)

General intelligence is particularly important given that care-leavers are known to be disadvantaged educationally (see Section 1.4.3.1). A small number of studies have tested the relationship between MASC and IQ and have generally found these to be relatively independent of one another (Dziobek *et al.*, 2006a; Preisler *et al.*, 2010). However, one study reported a negative correlation between under-interpretative mental state inferences and intelligence (Wolkenstein *et al.*, 2011). In the current study it was considered that additional cognitive assessment would need to be performed on a separate date to avoid overloading participants. Unfortunately, time and practical constraints meant that this was not feasible. Revisiting participants to perform cognitive assessments would have also increased the risk of participant drop out, particularly among individuals with complex psychological needs and unstable lifestyles, which would introduce bias into the results. Instead of measuring IQ

directly, this study attempted to control for the effects of general cognition by recruiting groups who were matched educationally. However, care-leavers and the comparison group differed in relation to the qualifications they had obtained and qualification level was associated with some aspects of social cognition. It was therefore considered necessary to control for the confounding effects of educational qualifications in analyses of MASC variables. This presents two issues. First, it is well recognised that educational achievement is less than a perfect proxy for general intelligence (Neisser *et al.*, 1996). As such, it is possible that some of the effects reported in this study are partially attributable to general cognition. Second, educational qualifications might be seen as a better index of general social disadvantage (Cox, 2002). Therefore controlling for this variable might inadvertently suppress some differences between care-leavers and non care-leavers that were not attributable to educational achievement or general cognition (e.g. adolescent stress; Goodman *et al.*, 2005).

As already noted this study did not include an explicit measure of socioeconomic status (SES). This represents a weakness given the disadvantages experienced by many young people leaving care and the association between SES and psychological difficulties in the general population (Skapinakis *et al.*, 2006). It is possible that the observed association between requiring local authority care and social cognition may be mediated by social economic variables. The measurement of SES in young people leaving care is problematic as many measures are dependent on estimates of parental income, accumulated economic assets, occupational status, and educational attainment. In the current study participation in education could be considered as a proxy for SES, but this is generally considered a poor indicator of overall socio-economic status (Braveman *et al.*, 2001). Future research might consider using a measure of SES specifically developed for young people (e.g. Lim & Gemici, 2011).

Finally, the primary aim of this thesis was to compare social cognition in care-leavers and a demographically matched young people raised by their birth parents. However, additional information about the early experiences of both groups was limited. None was sought for those in the comparison group. Additional information about care-leavers was sought from social services (e.g. age at entering care, number of placements and reason for being taken into care). However, insufficient information

was obtained to permit meaningful statistical analyses. As such, it was not possible to draw any conclusions about the precise causal mechanisms that contribute to attachment, emotional regulation and social cognitive difficulties in young people leaving care.

4.4 Theoretical implications of the current findings

The results from this study suggest that the mentalisation-based theoretical model and attachment theory offer a useful frameworks for understanding the complex difficulties experienced by young people leaving local authority care. They also add to a growing body of research linking early trauma and childhood adversity to later life emotional and behavioural dysregulation. The mentalisation-based model of psychopathology builds on attachment theory, proposing that our understanding of the mental states of ourselves and others develops primarily (but not exclusively) in the context of early attachment relationships and can be disrupted by later trauma (Fonagy & Luyten, 2009). Young people requiring local authority care have invariably experienced disruptions in attachment relationships and/or trauma. Impaired social cognition in this group offers direct support for predictions made by the mentalisation-based model and supports emerging evidence suggesting that early trauma has a detrimental impact on social cognition (Nazarov *et al.*, 2014; Preisler *et al.*, 2010). Fonagy and colleagues go on to suggest that the ability to ‘mentalise’ is essential for effective representation and regulation of emotional states. This prediction is supported by the observed association between social cognition and emotional regulation in this sample. Given that social cognition is just one facet of the broader concept of ‘mentalisation’, we might expect that social cognitive ability would *partially*, but not *wholly*, mediate the relationship between early adversity (as indexed by requiring local authority care) and emotional dysregulation. The findings of this study supported this prediction. Likewise, an association was observed between attachment anxiety and both emotional regulation and excess theory of mind attributions – which again is consistent with the mentalisation model.

The findings of this study provide a context for understanding how early negative experiences continue to have a detrimental effect on care-leavers during their

transition into adulthood. Difficulties in attachment relationships, impaired social cognition and emotional dysregulation are increasingly being recognised as important risk factors for a broad range of psychological difficulties (as discussed in Chapter 1 of this thesis). A tendency to over-interpret the mental states of others in social situations could precipitate and maintain fears of rejection in attachment relationships, which may interact in a vicious cycle with dysregulated emotions, leading to maladaptive coping strategies and impulsive behaviours (e.g. substance use, self-harm, aggressive behaviour, suicidal ideation or extremely isolative behaviour; Levy, 2005; Sharp *et al.*, 2011b). More broadly, the findings from the current study lend support to other psychological models, most notably the biosocial theory that underpins dialectical behaviour therapy (Linehan, 1993a). According to this theory, pervasively invalidating experiences in childhood (including childhood adversity, attachment difficulties and interpersonal difficulties) are key components in the development and maintenance of emotional dysregulation and the behavioural and social concomitants.

This study has implications for theoretical understandings of the relationship between attachment and social cognition – a topic around which there is currently debate. Dykas and Cassidy (2011) argue that secure and insecure individuals differ in the way in which they process social information. Based on a review of the literature they propose that those who possess insecure internal working models (e.g. those who score highly on *either* attachment anxiety or avoidance) are more likely to use defensive systems to suppress attachment relevant social information leading to poor social cognitive ability over time. In contrast, Mikulincer and Shaver (2007) have proposed a model that differentiates more explicitly between attachment anxiety and avoidance. They suggest that anxious individuals are more likely to be hypervigilant to social cues and to ruminate about the mental states of others – leading to more sophisticated and accurate mentalisation over time. In contrast, they predict that avoidant people will be more likely to dismiss or divert attention from attachment-related cues and to deny or suppress attachment-related mental states – leading to less sophisticated and less accurate social cognitive abilities (Hunefeldt *et al.*, 2013). Contrary to both these models, this study found that only attachment anxiety is significantly associated with less accurate mental state inferencing. One possible

explanation is that those who score more highly on attachment anxiety are hyper-vigilant to social cues (as predicted by Mikulincer and Shaver), but this leads to errors rather than ‘more accurate’ social cognition. Whereas those who are avoidant in attachment relationships may have developed good skills in interpreting the mental states of others as a means of exercising control in relationships and maintaining distance from others.

The finding from this study could have significant implications for understanding social functioning in young people leaving care. The ability to accurately process social signals is a prerequisite for consciously or unconsciously generating appropriate responses. As such, social cognitive skills are necessary for successful interactions and facilitate the development of short and long-term relationships with significant others (Roepke *et al.*, 2013). However, this study tells us little about the clinical significance of the observed deficits in social cognition in care-leavers. Whilst there is some evidence that social cognitive deficits on the MASC are related to markers of social functioning (e.g. social network size; Preller *et al.*, 2013), further research is needed to elucidate the ‘real world’ impact of these impairments on social functioning. Likewise, we might expect attachment representations to predict social functioning, but the evidence to date is contradictory (Bohlin & Hagekull, 2009; Bohlin *et al.*, 2000).

Finally, whilst the findings of this study place a number of difficulties within the individual, it is important not to ignore systemic factors. Social cognition is a not static and unitary concept, or trait. Inference about the mental states of others takes place within interpersonal contexts and in social settings (Liotti & Gilbert, 2011). It is therefore important to consider systemic factors and how they interact in maintaining and activating any tendency to over-interpret mental states of others. Young people leaving care are often thrust into independence (Stein, 2008) and are arguably one of the most vulnerable and disadvantaged groups in society (Tarren-Sweeney, 2008). As such, they are likely to be placed into situations, often deprived of the traditional supports of family, that activate patterns of attachment and idiosyncrasies in social cognition as a defensive means of coping with major life challenges.

4.5 Clinical and service implications

In the UK there is an increasing focus on providing specialist services for care-leavers (National Institute for Health and Clinical Excellence, 2013; National Institute for Health and Clinical Excellence & Social Care Institute for Excellence, 2010).

However, very little guidance has been provided concerning what these services might look like and how they can meet the psychological needs of care-leavers. The results from this study highlight the complex psychological, emotional and social needs of young people leaving care and suggest that interventions aiming to promote secure attachments, to improve social cognition and to build skills in emotional regulation might be helpful in improving outcomes for care-leavers. In the context of the current study, assessing and working with individuals to improve emotional regulation seems of primary importance, especially given the risks associated with maladaptive coping strategies (e.g. self-harm, suicide, substance misuse; Koenigsberg, 2010; Neumann *et al.*, 2010). Emotional dysregulation is also a well-recognised risk factor for many psychological problems and poor outcomes (Koenigsberg, 2010; Neumann *et al.*, 2010; Roll *et al.*, 2012). Taking account of these findings, dialectical behaviour therapy may be a useful intervention for young people leaving care. The primary goals of DBT focus on improving emotional regulation and reducing self-destructive behaviour (Linehan *et al.*, 1991). There is preliminary evidence from one study that an intervention package that interweaves dialectical behaviour therapy with dyadic developmental psychotherapy is helpful in improving emotional regulation and reducing self-harm behaviour in the care-leaver population (Andrew *et al.*, 2013).

Clinically, the finding of impaired social cognition among care-leavers is significant as deficits in interpreting the mental states of others have been shown to be an important transdiagnostic factor that increases risk to a broad range of mental health problems (Fonagy & Bateman, 2011; Liotti & Gilbert, 2011). As such, social cognition (and more broadly, mentalisation) provides an appropriate target for intervention in young people leaving care. A range of psychological approaches could be used to improve social cognitive ability. Indeed, it has been suggested that

mentalisation is a core mechanism of change by which all effective therapies work (Allen *et al.*, 2008; Fonagy & Bateman, 2011). One study has already demonstrated that inpatient treatment, founded upon principles of mentalisation-based therapy (Bateman & Fonagy, 1999), can bring about reductions in the tendency to over-interpret the mental states of others (Sharp *et al.*, 2013). Several other evidence-based interventions directly target social cognition; for example, metacognitive interpersonal therapy (Dimaggio *et al.*, 2007), transference focused psychotherapy (Clarkin *et al.*, 2007) and social cognition and interaction training (Combs *et al.*, 2007). Likewise, techniques included in other interventions provide a context that allows individuals to stand back from their immediate reactions and to think about the mental states of others. For example, interpersonal effectiveness skills training in dialectical behaviour therapy (Linehan, 1993b) and Socratic questioning in cognitive behavioural therapy (Padesky, 1993), as well as systems based approaches, such as family therapy (Carr, 2012). As well as providing an appropriate target for interventions, it is important to bear in mind the possible impact of social cognitive deficits when working with care-leavers (and, arguably, all individuals presenting for psychological therapy). Therapists should not assume that clients have accurately understood their thoughts, emotions and intentions. Instead, they should be explicitly expressed. Likewise, a mismatch between the therapist's own thoughts and emotions, and the inferences of their clients, might provide valuable therapeutic material within the context of a well-formed therapeutic relationship (see Andrew *et al.*, 2013 for a description of this in practice).

The findings from the current study also underscore the importance of thinking about attachment when providing services for young people leaving care. In recent years, there has been a trend toward developing interventions based directly on attachment principles (Davila, 2003; Johnson & Whiffen, 2003), with dyadic developmental therapy perhaps the most appropriate for use with looked after children and young people leaving care (Hughes, 2004). These approaches recognise the importance of past trauma, loss and rejection, as well as the self-fulfilling nature of internal working models, and seek to target attachment-related difficulties (Levy & Orlans, 2003). It is also important to recognise that patterns of attachment are likely to be played out in relation to services. For example, those with high levels of attachment avoidance might find it difficult to trust and engage with services, whereas those with more

anxious attachment styles might become dependent on professionals. A shared understanding of how service users relate to the service is essential in situations where transference and counter-transference issues are likely to be played out in relation to the whole team (British Psychological Society, 2007). Understanding these processes is important in reducing the risk that services respond to care-leavers in ways that replicate previous maladaptive relationship patterns (e.g. discharging individuals who find it hard to engage, or ‘rescuing’ those who become dependent on professionals). Likewise, those working with care-leavers should obtain reflective supervision to consider the impact of their own attachment style on their relationship with their clients (Smith *et al.*, 2010). This is especially important as there is evidence that therapists with secure attachment representations are better able to respond appropriately to the emotional needs of their clients (Bernier & Dozier, 2002). Finally, it should be noted that there were a broad range of scores across the two attachment dimensions amongst care-leavers in this study, which indicates that a proportion of care-leavers in this study were ‘well adjusted’. As such, services should not assume that all former care recipients face major attachment difficulties.

The finding of high levels of attachment insecurity amongst care-leavers, in the context of research demonstrating the link between attachment and a broad range of psychological and social difficulties, suggests that early preventative strategies aiming to foster secure attachments are likely to be beneficial for those who require local authority care. Meta-analyses have shown that interventions which aim to increase caregivers’ sensitivity to an infant’s needs and signals can be useful in reducing infant attachment disorganisation (Van Ijzendoorn & Bakermans-Kranenburg, 2008). Likewise, attachment based interventions (Lewis-Morrarty *et al.*, 2012) and placement with securely attached adoptive parents (Dozier *et al.*, 2001; Pace & Zavattini, 2011; Steele *et al.*, 2008) have been shown to be useful in promoting attachment security among fostered and adopted children. Unfortunately, preventative strategies are likely to be expensive in the short term and might not yield noticeable benefits for several years. In the context of the current economic climate and political pressures, reactive individualised interventions are likely to be the predominant model for working with young people in care for the foreseeable future (Scott, 2011).

Finally, this study might have clinical implications for young adults more generally. Whilst more pronounced difficulties with attachment, emotional regulation and social cognition were observed amongst care-leavers, interaction analyses indicated that strength of the *relationships* between attachment anxiety, social cognition and emotional regulation did not differ when comparing care-leavers and non care-leavers. As such, those providing services for adolescents and young adults in other settings might also pay attention to the social cognitive abilities of the individuals they are working with. This is especially important as poor social cognition skills in late adolescence or early adulthood can impede educational and vocational success and friendship formation, potentially leading to isolation, anxiety and depression (Ahmed & Miller, 2011).

4.6 Recommendations for future research

This research opens up several avenues for future research. First, the findings of this study need replication with a larger, more representative sample. Ideally such research should be carried out in the context of a comprehensive longitudinal assessment of social cognition. This study found evidence for deficits in social cognition and emotional regulation in individuals who had spent time in local authority care. However, further research is required to identify the specific risk factors that contribute to these deficits in this population. As discussed in Chapter One, compared to young people raised by their birth family, care-leavers are often disadvantaged educationally. They are also more likely to have witnessed or experienced physical, sexual and/or emotional abuse and have more commonly experienced neglect, as well as disruptions in attachment relationships. There is some evidence that early childhood trauma and attachment disruption leads to deficits in social cognition and social functioning (See Section 1.7.6.1). However, the existing studies often rely on retrospective accounts of childhood experiences and do not differentiate between forms of abuse (e.g. physical, sexual, emotional abuse or neglect). Longitudinal studies will be needed to elucidate the dynamic interplay between childhood adversity, attachment, social cognition and psychological difficulties among young people raised in local authority care.

The mentalisation model predicts that the capacity to mentalise mediates the relationship between early life experiences and emotional regulation. As described in Section 1.5.2, mentalisation is multi-faceted and overlaps with other concepts such as empathy, mindfulness, psychological mindedness, affect consciousness and social cognition. The latter was the main focus of this study and was found to *partially* mediate the relationship between early life experience and difficulties with emotional regulation. Previous research in this population has shown that young people leaving care have deficits in other areas of mentalisation. Specifically, Paull (2013) found that care-leavers reported higher levels of alexithymia than a matched comparison group of young people raised by their birth parents. Future research might seek to simultaneously assess social cognition, alexithymia and other measures of mentalisation to delineate their specific and combined relationship with psychological distress in this population.

The finding of relative poor social cognitive performance of the young people in this study compared with data from older cohorts in previous research warrants further attention. Adolescence and early adulthood appears to represent a critical period for the development of brain areas thought to influence social cognition (Blakemore, 2008a, 2008b; Blakemore *et al.*, 2007). However, few studies have sought to chart 'normal' social cognitive performance through this period, and what research does exist tends to utilise perspective-taking tasks that are commonly passed by five years of age (Dumontheil *et al.*, 2010). Further research, using more complex tasks, might seek to link social cognition to neural development. The MASC has recently been adapted for fMRI (Wolf *et al.*, 2010) and might be useful in this endeavour.

4.7 Conclusions

The ability to make accurate inferences about the mental states of other people is critically important for successful social interactions and facilitates the development of short and long-term relationships with significant others. Impairments in social cognition are increasingly being recognised as an important feature of many complex and serious mental health problems. This study provides important evidence that, compared with demographically matched young people raised by their birth parents,

young people who have spent time in care have greater impairments in social cognition and are more likely to over-interpret the mental states of others. Building on this, social cognition was found to be associated with attachment anxiety and emotional dysregulation. Importantly, impaired social cognition was shown to partially mediate the relationship between requiring local authority care (a marker of childhood adversity) and emotional dysregulation, suggesting that social cognitive style might be an appropriate target for therapeutic intervention. A further understanding of the interplay between early childhood adversity, attachment difficulties, social cognition and emotional regulation is likely to increase our understanding of the complex psychological and emotional difficulties experienced by some young people leaving local authority care, which ultimately may lead to the development of more effective therapeutic interventions for this population.

5. References

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Appendix A Search terms and databases used in the literature review

Care-leaver related search terms:

adoption, adopted (expanded), aging out of care, care leaver*, childhood in care, children leaving care, child welfare, experiences of leaving care, foster, looked after children, social care, social services, young people leaving care

Social Cognition

Social cognition, theory of mind, emotion* recognition, mentalis*, empathy

Databases

Web of Science,
Science Direct

OvidSP (Databases: Cardiff University Full Text Journals, Allied and Complementary Medicine, Embase (up to January Week 3 2014), Ovid Medline (up to January Week 3 2014), PsycArticles Full Text and Psychinfo (up to January Week 3 2014)).

Appendix B Participant information sheet (care-leaver group)



NHS
WALES
GIG
CYMRU

School of Psychology
Ysgol Seicoleg

South Wales Doctoral Programme in Clinical Psychology
De Cymru Rhaglen Doethuriaeth mewn Seicoleg Glinigol



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PARTICIPANT INFORMATION SHEET – CARE-LEAVER GROUP
Version 2 20/06/2013

Social cognition, attachment and psychological well-being in young adults leaving care

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You are being invited to take part in a research study. Before you decide whether to take part or not, it is important for you to understand why we are doing the research and what it will involve. Please take time to read the following information carefully and discuss it with friends and relatives if you wish. Those aged between 16 and 18 may like to discuss taking part in the study with their parents, carers or guardians. Please ask questions about anything that is unclear or if you would like to know more about the study.

What is the purpose of the study?

For professionals to provide useful services to young people leaving the care system, they need to know more about what these people want and need. Being in care can have positive and negative effects on a person's life and this study aims to investigate these. It will explore whether young people leaving care interpret social information differently to young people who have not spent time in care. We are also interested in how our ability to interpret social information is related to how we feel and how we see ourselves.

Why have I been invited?

You have been invited to take part in the study because you are aged between 16 and 22 and have spent time in care. We are hoping to invite about 45 young people who are leaving care, and 45 young people who have not spent time in care but are of a similar age, to take part in the study. Both groups will be asked to perform the same tasks and answer the same questionnaires.

Do I have to take part?

You do not have to take part in this research if you do not want to. If you would like to take part we will ask you to sign a consent form to say that you have read and understood this information sheet and that

you agree to take part. If you choose not to take part or want to stop at any time you will not need to give a reason – this will not affect any of the services that you receive.

What will I be asked to do?

If you decide you want to take part you will be invited to complete a task designed to measure how you interpret social information. The task involves watching a 15-minute film and answering questions about what the characters are thinking or feeling. You will also be asked to complete a number of short questionnaires. One questionnaire will ask some questions about yourself, like your age and gender. The other questionnaires will ask about your thoughts, feelings and behaviours, as well as about relationships and your life in general. You do not need to answer a question if you do not want to. Filling out these questionnaires should take less than one hour.

If you have spent time in care whilst growing up, we will also ask you to give us the name of your social worker or personal advisor so that we can ask them some questions about your care records. These questions will be about:

- Your age when you went into care.
- How long you have spent in care.
- The reason why you were taken into care.
- How many placements you have had in care.
- Whether you have returned to live with your family for any amount of time.

Will I get paid for taking part?

We will pay you any money that you spend on travelling to take part in the research. You will also be entered into a prize draw to win £20 worth of high-street vouchers. Four winners will be selected at random, two from each group.

What are the possible disadvantages and risks of taking part?

We do not expect people to become distressed as a result of taking part in this study. However, some people may find that they do become distressed. We will have some 'debrief' time in which you can talk to the researcher if you do feel worried or unhappy about anything. We will also give you some phone numbers that you can ring for support if you are concerned.

What are the possible benefits of taking part?

We do not think that taking part will provide you with any direct benefit. However, we hope that the research will give us more information about how to develop services that are useful for young people leaving care.

Will my taking part in the study be kept confidential?

Yes. We will follow ethical and legal guidelines to make sure that any information you give us is kept confidential and protected. Information that you give us will have your name and address removed so that you cannot be identified. This will happen as soon as you have completed all the questionnaires and your social worker/personal advisor has answered their questions. Information that is kept on paper will be kept in a locked cabinet in a secure place.

The only time that we may need to share personal information with other professionals is if you tell us anything that makes us very worried about you, or about somebody else's safety. For example, if you told us that you were planning on harming yourself or another person, or if your answers on any of the

questionnaires indicated you were suffering with significant distress, we would need to talk to other professionals.

Future research involving your anonymised information may involve other research groups. These could be researchers from Cardiff University, or independent research groups from other academic and/or private companies. Your anonymised data would only be made available to research groups with full ethical approval for the research undertaken.

What will happen to the results of the research study?

The results of the research will be written up and submitted as part of Paul Hollingworth's training to be a clinical psychologist. The findings may also be published in academic journals or presented at meetings or conferences. In all of these cases it will be impossible to identify you as all personal identifiers will be removed and individual results will not be shown.

If you would like to know more about the findings of the research you can request a summary of the outcomes from the researcher.

Who has reviewed the study?

The study has been reviewed and approved by the Cardiff School of Psychology Ethics committee.

What if there is a problem?

If you have a concern about any aspect of the research, you should ask to speak to the researchers who will do their best to answer your questions. If you remain unhappy and wish to complain formally, you can do this by contacting the Cardiff University School of Psychology Ethics committee:

Natalie Moran,
Secretary of the Ethics Committee,
School of Psychology, Cardiff University,
Tower Building, 70 Park Place,
Cardiff, CF10 3AT
Tel: 02920 20870360
Email: psychethics@cardiff.ac.uk
Web: <http://psych.cf.ac.uk/aboutus/ethics.html>

Further information and contact details

If you would like more information about the study please contact:

Researcher:

Paul Hollingworth,
Trainee Clinical Psychologist /
Postgraduate student
Doctoral Programme in Clinical Psychology
School of Psychology, Cardiff University,
11th Floor Tower Building, 70 Park Place,
Cardiff, CF10 3AT
Tel: 029 20870582
Email: hollingworthp@cardiff.ac.uk

Supervisor:

Professor Neil Frude
Research Director, South Wales Doctoral
Programme in Clinical Psychology &
Consultant Clinical Psychologist.
Doctoral Programme in Clinical Psychology,
School of Psychology, Cardiff University,
11th Floor Tower Building, 70 Park Place,
Cardiff, CF10 3AT
Tel: 029 20870582
Email: Neil.Frude@wales.nhs.uk

Appendix C Participant information sheet (non care-leaver group)



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School of Psychology
Ysgol Seicoleg

South Wales Doctoral Programme in Clinical Psychology
De Cymru Rhaglen Doethuriaeth mewn Seicoleg Glinigol



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PARTICIPANT INFORMATION SHEET – NON-CARE-LEAVER GROUP
Version 2 20/06/2013

Social cognition, attachment and psychological well-being in young adults leaving care

Researcher: Paul Hollingworth, Trainee Clinical Psychologist, Postgraduate Student.

Supervisors: Dr Liz Andrew, Consultant Clinical Psychologist.
Dr Cerith Waters, Clinical Psychologist
Professor Neil Frude, Research Director, South Wales Doctoral Programme in Clinical Psychology & Consultant Clinical Psychologist.

Contact: South Wales Doctoral Programme in Clinical Psychology
11th Floor, School of Psychology, Cardiff University, Tower Building,
70 Park Place, Cardiff, CF10 3AT
Tel: 02920 870582
Email: hollingworthp@cardiff.ac.uk

You are being invited to take part in a research study. Before you decide whether to take part or not, it is important for you to understand why we are doing the research and what it will involve. Please take time to read the following information carefully and discuss it with friends and relatives if you wish. Those aged between 16 and 18 may like to discuss taking part in the study with their parents, carers or guardians. Please ask questions about anything that is unclear or if you would like to know more about the study.

What is the purpose of the study?

For professionals to provide useful services to young people leaving the care system, they need to know more about what these people want and need. Being in care can have positive and negative effects on a person's life and this study aims to investigate these. It will explore whether young people leaving care interpret social information differently to young people who have not spent time in care. We are also interested in how our ability to interpret social information is related to how we feel and how we see ourselves.

Why have I been invited?

You have been invited to take part in the study because you are aged between 16 and 22 and have not spent time in care. We are asking you to participate as part of a comparison group. We are hoping to invite about 45 young people who are leaving care, and 45 young people who have not spent time in care but are of a similar age, to take part in the study. Both groups will be asked to perform the same tasks and answer the same questionnaires.

Do I have to take part?

You do not have to take part in this research if you do not want to. If you would like to take part we will ask you to sign a consent form to say that you have read and understood this information sheet and that you agree to take part. If you choose not to take part or want to stop at any time you will not need to give a reason – this will not affect any of the services that you receive.

What will I be asked to do?

If you decide you want to take part you will be invited to complete a task designed to measure how you interpret social information. The task involves watching a 15-minute film and answering questions about what the characters are thinking or feeling. You will also be asked to complete a number of short questionnaires. One questionnaire will ask some questions about yourself, like your age and gender. The other questionnaires will ask about your thoughts, feelings and behaviours, as well as about relationships and your life in general. You do not need to answer a question if you do not want to. Filling out these questionnaires should take around one hour.

Will I get paid for taking part?

We will pay you any money that you spend on travelling to take part in the research. You will also be entered into a prize draw to win £20 worth of high-street vouchers. Four winners will be selected at random, two from each group.

What are the possible disadvantages and risks of taking part?

We do not expect people to become distressed as a result of taking part in this study. However, some people may find that they do become distressed. We will have some 'debrief' time in which you can talk to the researcher if you do feel worried or unhappy about anything.

What are the possible benefits of taking part?

We do not think that taking part will provide you with any direct benefit. However, we hope that the research will give us more information about how to develop services that are useful for young people leaving care.

Will my taking part in the study be kept confidential?

Yes. We will follow ethical and legal guidelines to make sure that any information you give us is kept confidential and protected. Information that you give us will have your name and address removed so that you cannot be identified. This will happen as soon as you have completed all the questionnaires.

The only time that we may need to share personal information with other professionals is if you tell us anything that makes us very worried about you, or about somebody else's safety. For example, if you told us that you were planning on harming yourself or another person, or if your answers on any of the questionnaires indicated you were suffering with significant distress, we would need to talk to other professionals.

Future research involving your anonymised information may involve other research groups. These could be researchers from Cardiff University, or independent research groups from other academic

and/or private companies. Your anonymised data would only be made available to research groups with full ethical approval for the research undertaken.

What will happen to the results of the research study?

The results of the research will be written up and submitted as part of Paul Hollingworth's training to be a clinical psychologist. The findings may also be published in academic journals or presented at meetings or conferences. In all of these cases it will be impossible to identify you as all personal identifiers will be removed and individual results will not be shown.

If you would like to know more about the findings of the research you can request a summary of the outcomes from the researcher.

Who has reviewed the study?

The study has been reviewed and approved by the Cardiff School of Psychology Ethics committee.

What if there is a problem?

If you have a concern about any aspect of the research, you should ask to speak to the researchers who will do their best to answer your questions. If you remain unhappy and wish to complain formally, you can do this by contacting the Cardiff University School of Psychology Ethics committee:

Natalie Moran,
Secretary of the Ethics Committee,
School of Psychology, Cardiff University,
Tower Building, 70 Park Place,
Cardiff, CF10 3AT
Tel: 02920 20870360
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Further information and contact details

If you would like more information about the study please contact:

Researcher:

Paul Hollingworth,
Trainee Clinical Psychologist /
Postgraduate student
Doctoral Programme in Clinical Psychology
School of Psychology, Cardiff University,
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70 Park Place,
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Tel: 029 20870582
Email: hollingworthp@cardiff.ac.uk

Supervisor:

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Research Director, South Wales Doctoral
Programme in Clinical Psychology &
Consultant Clinical Psychologist.
Doctoral Programme in Clinical Psychology,
School of Psychology, Cardiff University,
11th Floor Tower Building,
70 Park Place,
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Tel: 029 20870582
Email: Neil.Frude@wales.nhs.uk

Appendix D Consent form (care-leaver group)



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CONSENT FORM - CARE-LEAVER GROUP

Version 2 20/06/2013

Social cognition, attachment and psychological well-being in young adults leaving care

Researcher: Paul Hollingworth, Trainee Clinical Psychologist, Postgraduate Student

Please initial boxes

I confirm that I have read and understood the information sheet, dated 20/06/2013, have been given a copy to keep and have had the chance to ask questions.

I understand that taking part in the study is voluntary and that I can withdraw at any time up until the data is anonymised, without needing to give a reason.

I understand that the information I provide will be anonymised immediately after the information has been collected; until then, it will remain confidential and secure. As set out in the Data Protection Act, the anonymised data may be held indefinitely.

I agree that the anonymised information I provide can be used in future projects, as described in the attached information sheet. I understand that some of these projects may be carried out by researchers other than those who ran the first project.

I give permission for the researcher to contact my personal advisor/social worker to ask them for information about my time in care.

I know how to contact the researcher if I need to.

I agree to take part in this research.

Participant's name

Signature

Date

Researchers name

Signature

Date

Name of personal advisor/social worker

Appendix E Consent form (non care-leaver group)



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CONSENT FORM – NON CARE-LEAVER GROUP
Version 2 20/06/2013

Social cognition, attachment and psychological well-being in young adults leaving care

Researcher: Paul Hollingworth, Trainee Clinical Psychologist, Postgraduate Student

Please initial boxes

I confirm that I have read and understood the information sheet, dated 20/06/2013, have been given a copy to keep and have had the opportunity to ask questions.

I understand that taking part in the study is voluntary and that I can withdraw at any time up until the data is anonymised, without needing to give a reason.

I understand that the information I provide will be anonymised immediately after the information has been collected; until then, it will remain confidential and secure. As set out in the Data Protection Act, the anonymised data may be held indefinitely.

I agree that the anonymised information I provide can be used in future projects, as described in the attached information sheet. I understand that some of these projects may be carried out by researchers other than those who ran the first project.

I know how to contact the researcher if I need to.

I agree to take part in this research.

Participant name

Signature

Date

Researcher name

Signature

Date

Appendix F Debrief form (care-leaver group)



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DEBRIEF FORM – CARE-LEAVER GROUP

Version 2 20/06/2013

Social cognition, attachment and psychological well-being in young adults leaving care

Thank you for taking part in this research. We hope that the information you have provided will help us to gain a better understanding of how young people think and feel about relationships and their life in general. In particular, we hope to better understand how early experiences and spending time in the care system can affect how people think, feel and behave, and how this affects their understanding of social situations. Hopefully this information will help us to provide services that are useful for young people who have spent time in care.

We would like to assure that the data you have provided will be anonymised once we have collected any necessary information from your keyworker/personal advisor. You are free to withdraw your information from this study without needing to give a reason. However, as your identity will not be retained, you can only withdraw up to the point that the data is anonymised. If you have a concern about any aspect of the research, you should ask to speak to the researchers who will do their best to answer your questions. If you remain unhappy and wish to complain formally, you can do this by contacting the Cardiff University School of Psychology Ethics committee in writing: Natalie Moran, Secretary of the Ethics Committee, School of Psychology, Cardiff University, Tower Building, 70 Park Place, Cardiff, CF10 3AT, by Telephone: 02920 20870360; or via Email psychethics@cardiff.ac.uk.

If you feel distressed by the things you have thought about today you may like to contact Dr Liz Andrew to discuss your concerns. She is a qualified clinical psychologist who works with young people leaving care and is supervising this research project. She can be contacted at the Skills for Living project (01495 767220) or by e-mailing lizandrew77@gmail.com. Alternatively, below are the contact details for organisations that may be able to offer some help. The researchers do not accept responsibility for the contents of advice obtained via the contacts below. Contacts sourced via CLIC online and www.dynwales.org.

Thank you again for taking part in this research. Please let the researcher know if you would like a summary of the findings of the study.

Researcher:

Paul Hollingworth, Trainee Clinical Psychologist /
Postgraduate student,
Doctoral Programme in Clinical Psychology
School of Psychology, Cardiff University,
11th Floor Tower Building,
70 Park Place,
Cardiff, CF10 3AT
Tel: 02920 20870582

Supervisor:

Professor Neil Frude
Research Director, South Wales Doctoral
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Consultant Clinical Psychologist.
Doctoral Programme in Clinical Psychology,
School of Psychology, Cardiff University,
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Tel: 029 20870582
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Appendix G Debrief form (non care-leaver group)



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DEBRIEF FORM – NON CARE-LEAVER GROUP

Version 2 20/06/2013

Social cognition, attachment and psychological well-being in young adults leaving care

Thank you for taking the time to take part in this research. We hope that the information you have provided will help us to gain a better understanding of how young people think and feel about relationships and their life in general. In particular, we hope to better understand how early experiences and spending time in the care system can affect how people think, feel and behave, and how this affects their understanding of social situations. Hopefully this information will help us to provide services that are useful for young people who have spent time in care.

We would like to assure that the data you have provided will be anonymised once you have completed all the questionnaires. You are free to withdraw your information from this study without needing to give a reason. However, as your identity will not be retained, you can only withdraw up to the point that the data is anonymised. If you have a concern about any aspect of the research, you should ask to speak to the researchers who will do their best to answer your questions. If you remain unhappy and wish to complain formally, you can do this by contacting the Cardiff University School of Psychology Ethics committee in writing: Natalie Moran, Secretary of the Ethics Committee, School of Psychology, Cardiff University, Tower Building, 70 Park Place, Cardiff, CF10 3AT, by Telephone: 02920 20870360; or via Email psychethics@cardiff.ac.uk.

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Thank you again for taking part in this research. Please let the researcher know if you would like a summary of the findings of the study.

Researcher:

Paul Hollingworth, Trainee Clinical Psychologist /
Postgraduate student,
Doctoral Programme in Clinical Psychology
School of Psychology, Cardiff University,
11th Floor Tower Building,
70 Park Place,
Cardiff, CF10 3AT
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Supervisor:

Professor Neil Frude
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School of Psychology, Cardiff University,
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70 Park Place,
Cardiff, CF10 3AT
Tel: 029 20870582
Email: Neil.Frude@wales.nhs.uk

Appendix H Copy of ethical approval from Cardiff University School of Psychology research ethics committee

From: psychethics@cardiff.ac.uk
Sent: 2 July 2013 11:31:27
To: hollingworthp@cardiff.ac.uk
Cc: Neil.Frude@wales.nhs.uk
Subject: Ethics Feedback - EC.13.06.04.3473R

Dear Paul,

The Chair of the Ethics Committee has considered your revised postgraduate project proposal: Social cognition, attachment and psychological well-being in young adults leaving care (EC.13.06.04.3473R).

The project has now been approved.

Please note that if any further changes are made to the above project then you must notify the Ethics Committee.

Best wishes,

Natalie

School of Psychology Research Ethics Committee
Tower Building
Park Place
CARDIFF
CF10 3AT

Ffôn /Telephone: +44 (0) 29 2087 0360
Ffacs/Fax: +44 (0) 29 2087 4858

Procedures and Instructions

Version 1 21/05/2013

- 1) **Initial statement to participants:** At the initial interview, and at each interview thereafter, the participant will be told that all information will be kept confidential, with one exception: if information is provided that poses a danger to the participant or another person. This includes information from the participant's reports, research measures or through direct observation. This protocol complies with Cardiff University's Safeguarding Children and Vulnerable Adults Policy (2010) and the All Wales Child Protection Procedures.

Disclosure or concern where there is an immediate risk to harm to the participant.

- 2) **Interviewer's response where there is an immediate risk of harm to the participant's life or safety:**

- a) **Participant is judged to be at risk of immediate harm to themselves.**

The interviewer's response must safeguard the immediate interests of the participant. If they are deemed to be at immediate risk (e.g. the participant discloses they are actively suicidal) the interviewer will suggest that they seek help from their GP or keyworker. The interviewer will offer to help make arrangements, by ringing the GP/keyworker or, in an acute situation, ringing a taxi or an ambulance to take the participant to casualty. If the latter is needed, the interviewer will accompany the participant, first ringing the GP's office/personal advisor/keyworker to explain the situation. The interviewer will not leave the participant until a health professional or the police have taken charge of the emergency situation. The interviewer will also inform the participant that they are obliged to report the disclosure to the Principal Investigator who in turn may be required to share this information with social services and the designated safeguarding officer of the host institution. The interviewer will contact the principal investigator immediately and not later than 24 hours following the disclosure.

- b) **Participant is judged to be at risk of immediate harm from another person(s) or situations**

If the participant is in *immediate* danger of harm from someone else (for example, if they are involved in an actively violent relationship at home, or if they have received threats of physical harm) the interviewers will say 'I find what you said about [repeats the informant's words] a bit worrying. I am worried about your safety in this situation and would like to contact the police to

ask if they might be able to help you'. The interviewer will ring the Police and explain the situation (using the participant's words) in the participant's presence. The interviewer will document and follow police advice. If necessary the interviewer will be expected to accompany the participant to the police station. The interviewer will not leave the participant until a health professional or the police have taken charge of the emergency situation. The interviewer will also inform the participant that they are obliged to report the disclosure to the Principal Investigator who in turn will be required to share this information with social services and the designated safeguarding officer of the host institution. The interviewer will contact the principal investigator immediately and not later than 24 hours following the disclosure.

3) Principal investigator responsibility where there is an immediate risk to a research participant

The principal investigator will discuss the disclosure with the Clinical Supervisor and where appropriate make a referral to social services as soon as the problem or concern becomes apparent (at the latest within 24 hours). During office hours referrals will be made by telephone to the local social services office. Outside of office hours a referral will be made to the Emergency Duty team. Social services should acknowledge the referral within one working day of receiving it. The Principal Investigator will be required to contact social services again if no response has been received within 3 working days. If the decision by social services is to take no action, this will be recorded, including the reasons for the decision.

The Principal Investigator will record in writing any discussion about a young person's or vulnerable adult's welfare, including a note of the date and time, and details of the individuals who participated in the discussion. At the end of each discussion there should be a clear agreement about what actions will be taken and by whom. This should be documented and disseminated to relevant parties. Records of all discussions will be stored in a confidential and secure manner together with the participant's consent form.

Disclosure or concern where there is NOT an immediate risk to harm to the participant.

- 4) Interviewer's response to a worrying disclosure where there is not an immediate risk:** If the participant reports abuse or neglect in the past, past thoughts about self-harm, or any other information that suggests the participant might be in danger at some future point or that they are suffering from clinically significant psychological distress, the interviewer should say, 'I find what you said about [repeats the informant's words] worrying. Do you think you need to get

some help to deal with this? It would be good if you talked to your GP about this. Would you like me to help you set up an appointment?' If the participant is willing, the interviewer will ring the GP's surgery and help the participant make the appointment at that point. If the participant is unwilling to ring the GP immediately, the interviewer should re-explain the limits of confidentiality and say: 'I will need to talk to my supervisor about the best way to get you some help. I'm a little bit worried, and I need to talk about this with the rest of the team. After I do that, I will come back and talk things through with you'. The interviewer must immediately inform the Principal Investigator and put down in writing the details of disclosure or concern and store this information securely with the participant's consent form.

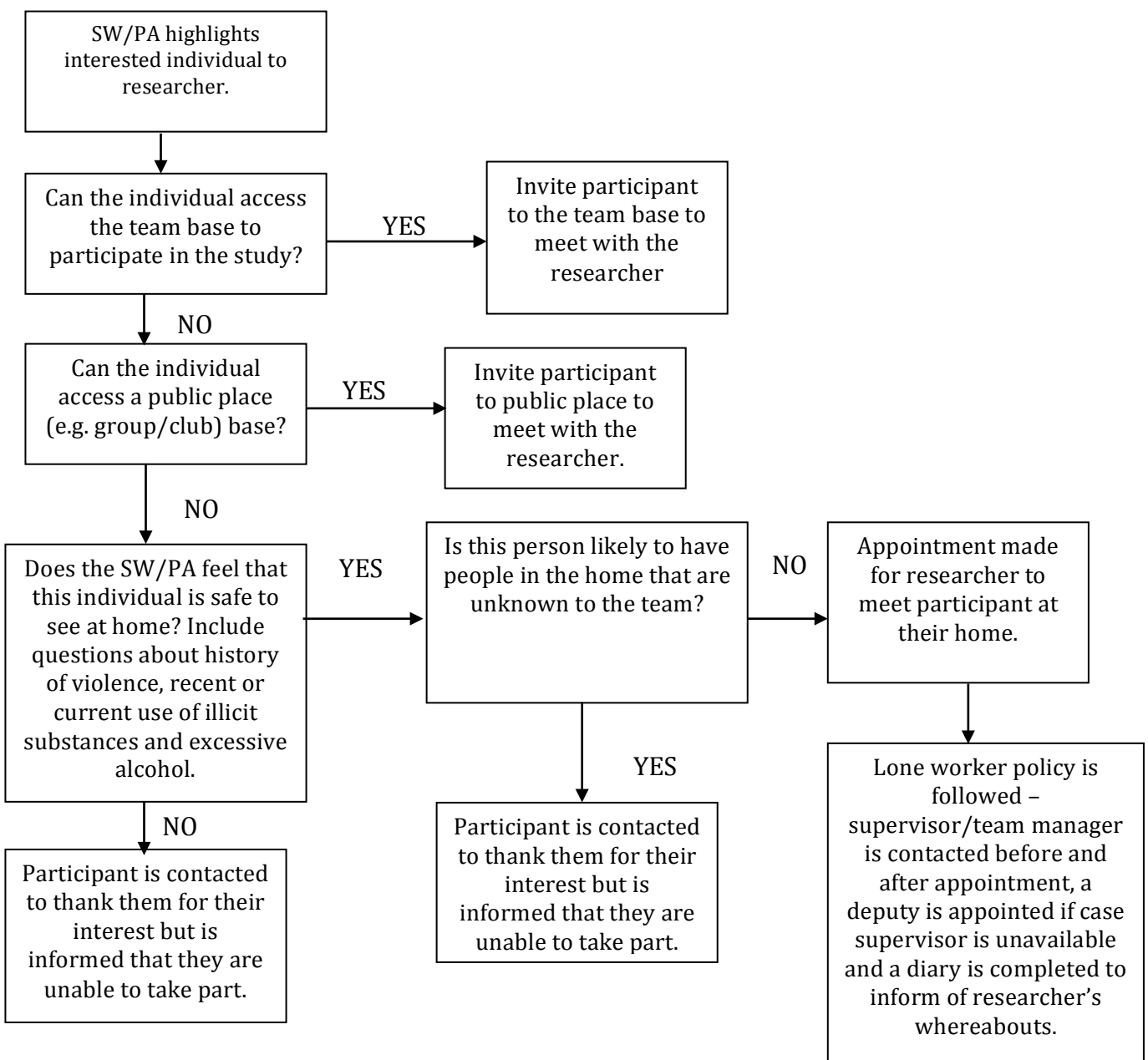
5) Principal investigator's responsibility where there is a disclosure or concern which does NOT pose an immediate risk to a research participant

The Principal Investigator will discuss the concerning information with the Clinical Supervisor and make the decision about whether or not to break confidentiality and inform the GP practice, social services or the police as appropriate. The Principal Investigator will record in writing any discussion about a young person's or vulnerable adult's welfare, including a note of the date and time, and details of the individuals who participated in the discussion. At the end of each discussion there should be a clear agreement about what actions will be taken and by whom. This should be documented and disseminated to relevant parties. Records of all discussions will be stored in a confidential and secure manner together with the participant's consent form.








All concerns regarding young people's safety or wellbeing will be reported by the Principal Investigator to the designated safeguarding officer for Coleg Gwent or Action for Children as appropriate. The Principal Investigator will also report all concerns regarding young people recruited through Action for Children to their personal advisor/keyworker within the service. The School of Psychology Disclosure Incident Report Form template will be completed by the Principal Investigator and submitted to the School of Psychology Ethics Committee as soon as possible after the incident.

Appendix J Lone worker policy

Non care-leavers will be assessed within educational settings where other members of staff will be available for contact. Members of the care-leaver group will be identified by their social worker (SW) or personal advisor (PA), who will have prior knowledge of the individual and associated risks. The figure below demonstrates the risk assessment process that the researcher will complete with the social worker/personal advisor before meeting with potential participants.



Appendix K Introduction and example scene from the Movie for the Assessment of Social Cognition

<p>You will be watching a 15 minute film. Please watch very carefully and try to understand what each character is feeling or thinking.</p>	<p>Now, you will meet each character.</p>	<p>This is Sandra</p> 
<p>This is Betty</p> 	<p>This is Cliff</p> 	<p>This is Michael</p> 
<p>The film shows these four people getting together for a Saturday evening.</p>	<p>The movie will be stopped at various points and some questions will be asked. All of the answers are multiple choice and require one option to be selected from a choice of four. If you are not exactly sure of the correct answer, please guess.</p>	<p>When you answer, try to imagine what the characters are feeling or thinking at the very moment the film is stopped.</p>
		
<p>Clip A from Scene 1:</p> <p>A young and attractive woman named Sandra opens the front door.</p>	<p>Clip B from Scene 1:</p> <p>Upon opening the door, a man, who looks to be around the same age as Sandra, enters the house.</p>	<p>Clip C from Scene 1:</p> <p>Before she can answer, he tells her that she looks terrific. He asks whether she did something with her hair.</p>



Clip D from Scene 1:

Sandra touches her hair and starts to say something but the young man compliments her by telling her that her hair looks very classy.

1. What is Sandra feeling?

- a. her hair does not look that nice
- b. she is pleased about his compliment
- c. she is exasperated about Michael coming on too strong
- d. she is flattered but somewhat taken by surprise

The movie then stops and subjects are asked to answer the following question

Scoring Key for scene 1:

Response	Error Category
a	'No Theory of Mind (TOM)'
b	'Reduced TOM'
c	'Excess TOM'
d	Correct

Appendix L Research questionnaire

DEMOGRAPHIC INFORMATION

Date: _____

Participant ID: _____

GENDER	Female <input type="checkbox"/> ₀ Male <input type="checkbox"/> ₁
DATE OF BIRTH:	
LOCATION OF INTERVIEW	<input type="checkbox"/> ₀ Private household <input type="checkbox"/> ₁ School / college / university <input type="checkbox"/> ₂ Hospital site <input type="checkbox"/> ₃ Library, café or other public place <input type="checkbox"/> ₄ Social services <input type="checkbox"/> ₅ Action for children site <input type="checkbox"/> ₆ Other; specify
TYPE OF ACCOMMODATION	<input type="checkbox"/> ₀ Living alone <input type="checkbox"/> ₁ Living with partner/spouse <input type="checkbox"/> ₂ Living with family <input type="checkbox"/> ₃ Living with friends <input type="checkbox"/> ₄ No fixed accommodation <input type="checkbox"/> ₅ Other; specify
RELATIONSHIP STATUS Have you ever been in a relationship that you considered close with a girlfriend, boyfriend or partner?	<input type="checkbox"/> ₀ Single <input type="checkbox"/> ₁ In a relationship (not living together) <input type="checkbox"/> ₂ Living with another <input type="checkbox"/> ₃ Married <input type="checkbox"/> ₄ Separated / Divorced <input type="checkbox"/> ₅ Widowed <input type="checkbox"/> ₆ Other; specify <input type="checkbox"/> ₇ Would rather not say <input type="checkbox"/> ₀ No <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₉ Would rather not say
PROFESSIONAL INPUT Have you ever spoken to anyone professionally or attended counselling/therapy to talk about your thoughts and feelings?	<input type="checkbox"/> ₀ No <input type="checkbox"/> ₁ Yes → Please specify: <input type="checkbox"/> ₉ Would rather not say

ETHNICITY

A) White

- English/Welsh/Scottish/Northern Irish/British ₁
Irish ₂
Traveller ₃
Any other white background ₄ → Please specify

B) Mixed/multiple ethnic groups

- White and Black Caribbean ₅
White and Black African ₆
White and Asian ₇
Any other mixed/multiple ethnic background ₈ → Please specify

C) Asian/Asian British

- Indian ₉
Pakistani ₁₀
Bangladeshi ₁₁
Chinese ₁₂
Any other Asian background ₁₃ → Please specify

D) Black/African/Caribbean/Black British

- African ₁₄
Caribbean ₁₅
Any other Black/African/Caribbean/Black British ₁₆ → Please specify

E) Other Ethnic Group

- Arab ₁₇
Any other ethnic group ₁₈ → Please specify

EDUCATION AND EMPLOYMENT

How many years have you spent in full-time education?	years		
WHICH QUALIFICATIONS DO YOU HAVE			
	No	Yes	Still studying
1-4 GCSEs (any grades), Entry Level, Foundation Diploma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NVQ level 1, Foundation GNVQ, Basic Skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5+ GCSEs (grades A*-C), School certificate, 1 A- level/2-3 AS levels/VCEs, Higher Diploma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NVQ level 2, Intermediate GNVQ, City and Guilds Craft, BTEC First/General Diploma, RSA Diploma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Apprenticeship	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2+ A levels, 4+ AS levels, Higher School Certificate, Progression/Advanced Diploma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NVQ Level 3, Advanced GNVQ, City and Guilds Advanced Craft, ONC, OND, BTEC National, RSA Advanced Diploma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Degree (for example BA, BSc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Higher degree (for example MA, PhD, PGCE)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NVQ Level 4 - 5, HNC, HND, RSA Higher Diploma, BTEC Higher Level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Professional qualifications (e.g. teaching, nursing, accountancy)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other vocational / work-related qualifications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
→ Please specify			
No qualifications		<input type="checkbox"/>	
Foreign qualifications	Yes	<input type="checkbox"/>	→ Please tick nearest UK equivalents (if known)
LAST WEEK WERE YOU:			
	Tick all that apply		
A student		<input type="checkbox"/>	
Working full time as an employee		<input type="checkbox"/>	
Working part time as an employee		<input type="checkbox"/>	
On a government sponsored training scheme		<input type="checkbox"/>	
Self-employed or freelance		<input type="checkbox"/>	
Working paid or unpaid for your own or your family' s business		<input type="checkbox"/>	
Away from work ill, on maternity leave, on holiday or temporarily laid off		<input type="checkbox"/>	
Doing any other kind of paid work		<input type="checkbox"/>	
Not in employment or education		<input type="checkbox"/>	
None of the above		<input type="checkbox"/>	
→ Please specify			

Your thoughts and feelings

Date: _____

Participant ID: _____

Please read each question carefully and select the answer that you think most accurately reflects your opinion. We are interested in your honest opinion.

	Almost Never (1)	Some- times (2)	About half the time (3)	Most of the time (4)	Almost always (5)
1. I am clear about my feelings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I pay attention to how I feel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I experience my emotions as overwhelming and out of control.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I have no idea how I am feeling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I have difficulty making sense out of my feelings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I am attentive to my feelings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I know exactly how I am feeling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I care about what I am feeling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I am confused about how I feel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. When I'm upset, I acknowledge my emotions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. When I'm upset, I become angry with myself for feeling that way.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. When I'm upset, I become embarrassed for feeling that way.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. When I'm upset, I have difficulty getting work done.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. When I'm upset, I become out of control.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. When I'm upset, I believe that I will remain that way for a long time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. When I'm upset, I believe that I'll end up feeling very depressed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. When I'm upset, I believe that my feelings are valid and important.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. When I'm upset, I have difficulty focusing on other things.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

... Your thoughts and feelings (2)

Almost Never (1) Some- times (2) About half the time (3) Most of the time (4) Almost always (5)

19. When I'm upset, I feel out of control..	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
20. When I'm upset, I can still get things done.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
21. When I'm upset, I feel ashamed with myself for feeling that way.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
22. When I'm upset, I know that I can find a way to eventually feel better.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
23. When I'm upset, I feel like I am weak.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
24. When I'm upset, I feel like I can remain in control of my behaviours.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
25. When I'm upset, I feel guilty for feeling that way.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
26. When I'm upset, I have difficulty concentrating.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
27. When I'm upset, I have difficulty controlling my behaviours.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
28. When I'm upset, I believe there is nothing I can do to make myself feel better.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
29. When I'm upset, I become irritated with myself for feeling that way.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
30. When I'm upset, I start to feel very bad about myself.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
31. When I'm upset, I believe that wallowing in it is all I can do.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
32. When I'm upset, I lose control over my behaviours.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
33. When I'm upset, I have difficulty thinking about anything else.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
34. When I'm upset, I take time to figure out what I'm really feeling.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
35. When I'm upset, it takes me a long time to feel better.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
36. When I'm upset, my emotions feel overwhelming.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

Your Relationships

Date: _____

Participant ID: _____

The statements below concern how you feel in emotionally intimate relationships. We are interested in how you *generally* experience relationships, not just in what is happening in a current relationship.

Please read each question carefully and select the answer that you think most accurately reflects your opinion. We are interested in your honest opinion.

1. I worry a lot about my relationships.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
2. I prefer not to be too close to romantic partners.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
3. I find it easy to depend on romantic partners.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
4. I often worry that my partner will not want to stay with me.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
5. I am very comfortable being close to romantic partners.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
6. I tell my partner just about everything.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
7. I'm afraid that I will lose my partner's love.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
8. I often worry that my partner doesn't really love me.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
9. I get uncomfortable when a romantic partner wants to be very close.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
10. I worry that romantic partners won't care about me as much as I care about them.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
11. I often wish that my partner's feelings for me were as strong as my feelings for him or her.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
12. When my partner is out of sight, I worry that he or she might become interested in someone else.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
13. It's not difficult for me to get close to my partner.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
14. I rarely worry about my partner leaving me.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
15. I prefer not to show a partner how I feel deep down.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
16. My romantic partner makes me doubt myself.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
17. It's easy for me to be affectionate with my partner.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
18. I do not often worry about being abandoned.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree

... Relationships (2)

19. I find that my partner(s) don't want to get as close as I would like.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
20. Sometimes romantic partners change their feelings about me for no apparent reason.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
21. I am nervous when partners get too close to me.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
22. My partner really understands me and my needs.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
23. My desire to be very close sometimes scares people away.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
24. I find it relatively easy to get close to my partner.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
25. I'm afraid that once a romantic partner gets to know me, he or she won't like who I really am.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
26. It makes me mad that I don't get the affection and support I need from my partner.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
27. I talk things over with my partner.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
28. I worry that I won't measure up to other people.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
29. My partner only seems to notice me when I'm angry.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
30. I feel comfortable sharing my private thoughts and feelings with my partner.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
31. I find it difficult to allow myself to depend on romantic partners.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
32. I don't feel comfortable opening up to romantic partners.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
33. I usually discuss my problems and concerns with my partner.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
34. It helps to turn to my romantic partner in times of need.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
35. When I show my feelings for romantic partners, I'm afraid they will not feel the same about me.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
36. I feel comfortable depending on romantic partners.	Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree

MASC: Multiple Choice Scoring Sheet

Date: _____

Participant ID: _____

1.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
2.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
3.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
4.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
5.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
6.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
7.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
8.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
9.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
10.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
11.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
12.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
13.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
13.c	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
14.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
15.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
16.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
17.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
18.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
19.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
20.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
21.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
22.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
23.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
24.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
25.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>

26.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
27.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
28.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
29.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
30.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
31.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
32.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
33.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
33c.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
34.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
35.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
36.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
37.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
38.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
38c.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
39.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
40.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
41.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
42.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
43.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
44.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
45.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
46c.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
47c.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>
48c.	a	<input type="checkbox"/>	b	<input type="checkbox"/>	c	<input type="checkbox"/>	d	<input type="checkbox"/>

Care History

Date: _____

(completed by social worker or personal advisor)

Reason(s) for being placed in Care

- Neglect
- Physical abuse
- Sexual abuse
- Emotional abuse
- Child's disability
- Parent's disability
- Family dysfunction
- Family in acute stress
- Low income
- Absent parenting
- Socially unacceptable behaviour
- Other Please Specify

Time spent in Care

Age when entering the care system years
Age when leaving the care system years
Total time spent in care years months

Care Placements

Total number of placements

Type of Care Placements

- Foster placement
- Adoption
- Looked after child placed with parents
- Residential care home
- Residential School
- NHS nursing / medical care
- Secure units, children's homes / hostels
- Living independently
- Absent
- Other Please Specify