THE ROLE OF THEORY OF MIND IN THE EMOTIONAL, BEHAVIOURAL AND COMMUNICATIVE FUNCTIONING OF ADOPTED ADOLESCENTS

By

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A THESIS SUBMITTED TO THE UNIVERSITY OF BIRMINGHAM FOR THE DEGREE OF DOCTOR OF CLINICAL PSYCHOLOGY

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March 2017

THESIS OVERVIEW

The thesis is comprised of three sections. The first is a Literature Review covering studies published in the English language that investigate mentalizing skills amongst adolescents either with diagnosis of Borderline Personality Disorder or with behavioural traits characteristic of this condition. There is increased acceptance the psychological difficulties and behaviours that comprise the diagnosis of BPD in adults begin in childhood & adolescence. The Review examines the studies to date investigating the role of mentalization in the onset and maintenance of these difficulties, with suggestions for further research in this area.

The second section describes a quantitative study exploring mentalization functioning of a group of adolescents who have been adopted, compared with a group of age and gender-matched non-adopted adolescents. Early adversity (e.g. child abuse and neglect, admission into foster care) has been associated with a range of later life negative outcomes, including mental health. For the adopted group, analyses were also undertaken to explore for relationships between current functioning (emotional, behavioural, mentalization, communication skills) and early experiences. Results of statistical analyses

are presented, followed by discussion. The study findings are considered with respect to areas for future research.

References for the first and second papers are included after each paper, respectively. The third section consists of Appendices, including a Public Domain briefing paper, quality estimations of the research studies reviewed, and a summary table of each study article. Information for participants, and consent and ethics documentation relating to the empirical paper, are also included.

ACKNOWLEDGEMENTS

With my gratitude firstly to the young people who agreed to take part in this research, who volunteered after being contacted via a number of Local Authority Adoption Teams around the West Midlands, and the adoption charity Adoption UK; thanks to the social workers and to Adoption UK for their assistance and co-operation. Thanks also to young people from local schools in Warwickshire and Wolverhampton who agreed to participate in the comparison group for the research project.

My thanks go to Dr Gary Urquhart-Law and Dr Helen Rostill at the University of Birmingham for supervision throughout the lengthy journey towards submission, Helen for supervision in the earlier years and Gary for fantastic support, oversight and editing subsequently and during the crucial last few years. I am deeply appreciative of their time, rigour and knowledge. My thanks also to Dr Chris Jones for his help and expertise with statistical analysis. I would also like to thank Mrs Jenni Stephens and Worcestershire Community and Mental Health NHS Trust for support, including financial assistance, during the first years of this qualification.

Heartfelt thanks are extended to my sons Dylan & Morgan for their patience and support over the years, particularly when Dad was unavailable to help out or play because he was "doing his Doctorate". Sian, my wife, has been a rock with her tolerance, acceptance and encouragement. My deepest appreciation for all the support she has provided to me throughout.

I would also like to thank my mum who has tactfully queried progress over the years and, although her awareness is now greatly reduced, I'm sure she will be bursting with pride to know that I’ve finally got across the finishing line!

CONTENTS

III Public Dissemination Document:

Appendices

List of Figures

List of Tables

CHAPTER ONE – LITERATURE REVIEW.

MENTALIZING DIFFICULTIES IN ADOLESCENTS WITH BORDERLINE PERSONALITY DISORDER PATHOLOGY: A SYSTEMATIC REVIEW.

Supervised by:

G. Urquhart Law

Mentalizing difficulties in adolescents with borderline personality disorder pathology: A systematic review.

Abstract

Background: Research indicates that mentalization dysfunctions (e.g., hypermentalization; negative social judgment bias) are linked to the core features of adults with Borderline Personality Disorder (BPD; severe disturbances of relationships, emotional dysregulation and impulsive instability characteristics). More recently, there is an emerging literature concerned with traits and formal diagnosis of BPD in adolescents, although this literature has not yet been reviewed with respect to the specific contribution of mentalizing to the diagnostic features of BPD. The present systematic review synthesises literature on this topic to help explore the relationships between mentalization and symptoms of BPD in adolescents.

Methodology: Systematic searches were conducted in three databases in December 2016 (PsycInfo, Medline, Web of Science), and the University of Birmingham Full Text Journals database was reviewed. 16 studies met the inclusion criteria for review (i.e. studies that focused on adolescents where there was either a clear diagnosis of BPD or where the authors provide evidence and an assertion that traits/behaviours being studies were consistent with BPD or emerging BPD). Methodological quality was rated using a published criteria (Kmet, 2004).

Results: Adolescents with high levels of BPD trait behaviours or who met diagnostic criteria for BPD were found to be more sensitive to facial emotion

processing at lower intensities of presentation, in particular for anger and disgust expressions; they were also more likely to process such stimuli in ways that triggered heightened affective empathy and excessive theory of mind (both being characteristics of BPD). Attachment insecurity was also a factor alongside mentalizing problems in clinical presentations of the disorder at both the trait and clinical diagnosis-level.

Discussion: Structured assessments to measure mentalizing functions in adolescent BPD remains in early stages, although the use of 'online' video-based vignettes that assess for excessive ToM/hypermentalization have produced encouraging results in terms of mapping mentalizing function to behavioural difficulties characteristic of BPD, and sensitivity to change. There are some suggestions for clinical practice such as milieu therapy and treatments that target hypermentalization. Treatments for BPD in adolescents that have been reported to date are based on two psychodynamic models targeted for adolescents. More research is needed in the area and also around early identification and interventions for children and young people with mentalizing dysfunctions, and options for outpatient/community treatments. Future research is needed to explore non-clinical adolescents' performance on assessment instruments.

1 Introduction

Borderline Personality Disorder

Borderline Personality Disorder (BPD) is a severe mental health condition that is characterised by pervasive impairments in four key domains: emotion (such as anger and emotional instability); interpersonal difficulties (e.g., unstable relationships and fears of abandonment); cognitive dysregulation (e.g., dissociation, de-personalisation); and behavioural dysregulation (e.g., impulsive behaviour and self-harm) (American Psychiatric Association, 2013). BPD is regarded as a significant public health problem, being associated with severe psychosocial impairments, as well as high mortality rates as a result of suicide and significant public health concerns (Skodol, et al., 2002; Tomko, Trull, Wood, and Sher, 2014). BPD is believed to usually have onset during the adolescent years (American Psychiatric Association, 2000).

The origins of BPD are believed to be related to the outcomes from an interaction of temperamental vulnerability (such as emotional reactivity or difficulties in accepting soothing) and environmental factors, such as insensitive parenting and attachment insecurity/disorganisation. Linehan (1993) described the "invalidating environment" (e.g., a tendency to disregard negative emotional experiences, especially negative ones, and to oversimplify the ease of solving difficult problems) that she felt interfered with the development of a secure child-parent attachment and the consequent learning of resilient emotion regulation strategies:

"Invalidating environments during childhood contribute to the development of emotional dysregulation; they also fail to teach the child how to label and regulate arousal, how to tolerate emotional distress, and when to trust her own emotional responses as reflections of valid interpretations of events." (Linehan, 1993, page 42).

Adolescent

Adolescence is the developmental stage that characterises the transition from childhood to adulthood. Theorists have identified adolescence as a period characterised by an ‘identity crisis’ with a struggle for the adolescent to identify "who he is" and "who he wants to be" (e.g., Erikson, 1963). Socially, the typical adolescent (in this phase of individuation) will distance themselves from parental figures, often forming intense relationships with peers (Wexler, 1991). It is the stage during the lifespan when sexual identity and interest emerges (Boyle & Senior, 2008; Sisk & Foster, 2000; Tolman & McClelland, 2011).

Adolescence is a phase of "…demonstrated specific changes in neural architecture…" with implications for "… brain development for executive functions and social cognition…" (Blakemore & Choudhury, 2006). Consequentially, the adolescent brain is felt to be more sensitive to experiential input particularly in relation to executive functions and social cognition (Blakemore & Choudhury, 2006).

BPD in Adolescence

Epidemiological data suggest a lifetime prevalence rate for BPD of between 1.4% and 5.9% for adults (Grant et al., 2008) with an estimated community prevalence for formal diagnosis amongst adolescents to be

between 0.9% and 3% (Bernstein, et al., 1993; Chanen, McCutcheon, Jovev, Jackson & McGorry, 2007). However, whilst there seems to be a legitimate subgroup of severely affected adolescents (for whom the symptoms remain stable and continuous) it appears that there may be a less-severe subgroup that can move in and out of the diagnostic threshold (Miller, Muehlenkamp, & Jacobson, 2008). This diagnostic controversy particularly applies to the categorical BPD diagnosis; however the stability of the primary impairments when measured dimensionally is somewhat higher (Chanen et al., 2004), with the estimated prevalence (of BPD trait psychopathology) as high as 22% in an treatment sample of outpatient youth (Chanen et al., 2008). The controversy as to the legitimacy or acceptability of the use of the term 'BPD in adolescence' has made formal diagnosis somewhat controversial, although there is an emerging body of evidence that valid and reliable diagnoses can be made prior to 18 years of age (Chanen, Jovev, & Djaja et al., 2008; Sharp & Fonagy, 2015).

Mentalization

Mentalization, as operationalized in this review, are those capacities identified by Fonagy (1991) serving 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" (Page 641). Mentalization has also been described as the capacity to *understand actions* in terms of thoughts and feelings, with enhanced mentalization beneficial to strengthen self-determination and self-control (Rossouw & Fonagy, 2012).

Mentalization is a concept within the polymorphous and heterogeneous construct of social cognition (Sharp, Fonagy & Goodyer, 2008), such that social cognition has been defined as "the processes by which children and adults understand themselves and others in terms of how they think, feel, perceive, imagine, reacts, attribute, in further, and so on." (Sharp, Fonagy & Goodyer, 2008). Figure 1 shows the relationship of mentalization to the broader construct of social cognition.

<table>
<tr><td></td><td></td><td></td><td></td><td>Auto bio memory</td></tr>
<tr><td></td><td></td><td></td><td>Trust, co-operation</td><td></td></tr>
<tr><td></td><td></td><td colspan="3">Attitudes, prejudice, intergroup relations, judgmental heuristics</td></tr>
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<tr><td>Intersubjectivity</td><td></td><td colspan="2">Trait understanding</td><td></td></tr>
<tr><td>Joint attention</td><td>False belief/desire</td><td colspan="3">Interpretive theory of mind, second-order theory of mind, mentalizing</td></tr>
<tr><td colspan="2">Attachment representation</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Face processing, perspective taking</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Moral development</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Empathy, emotional understanding</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Self-understanding, self-awareness, self-regulation</td><td></td><td></td><td></td></tr>
<tr><td>INFANCY</td><td>2-4 YEARS</td><td>4-8 YEARS</td><td>8-12 YEARS</td><td>12-18 YEARS</td></tr>
</table>

Figure 1: Social cognitive constructs most commonly cited in relation to normative development (taken from Sharp, Fonagy & Goodyer, 2008, page 4)

Dimensions to mentalization

Mentalization has been described as the process by which the actions of others (and of ourselves) are implicitly and explicitly interpreted in meaningful ways by imagining, predicting and ‘reading’ the mental states underpinning the behaviours of self and others (Bateman & Fonagy, 2008). There are many

facets to mentalization and the concept is used interchangeably with other social cognitive constructions such as mindfulness, emotional consciousness, meta-cognition, mind-reading, theory of mind, psychological mindedness, empathy, reflective functioning and emotional intelligence (Choi-Kain & Gunderson, 2008; Lysaker et al., 2011)

Mentalization as a conceptual field has been developed into a framework that comprises four key constructs: (1) implicit vs explicit functioning; (2) relating to the self or another; (3) referring to cognitive or affective aspects of the mentalizing; and (4) internally or externally focused (Choi-Kain & Gunderson, 2008; Fonagy & Bateman, 2011). These four constructs offer a useful framework to help comprehend how the different dimensions of mentalization relate to the multiple overlapping social-cognitive domains in the field such as empathy, mindfulness, emotional intelligence and social cognition generally.

Choi-Kain & Gunderson (2008) placed these four constructs from the mentalization framework into a model to show how mentalization might usefully be conceptualised alongside the related concepts of psychological mindedness, empathy, affect consciousness and mindfulness (Figure 2).

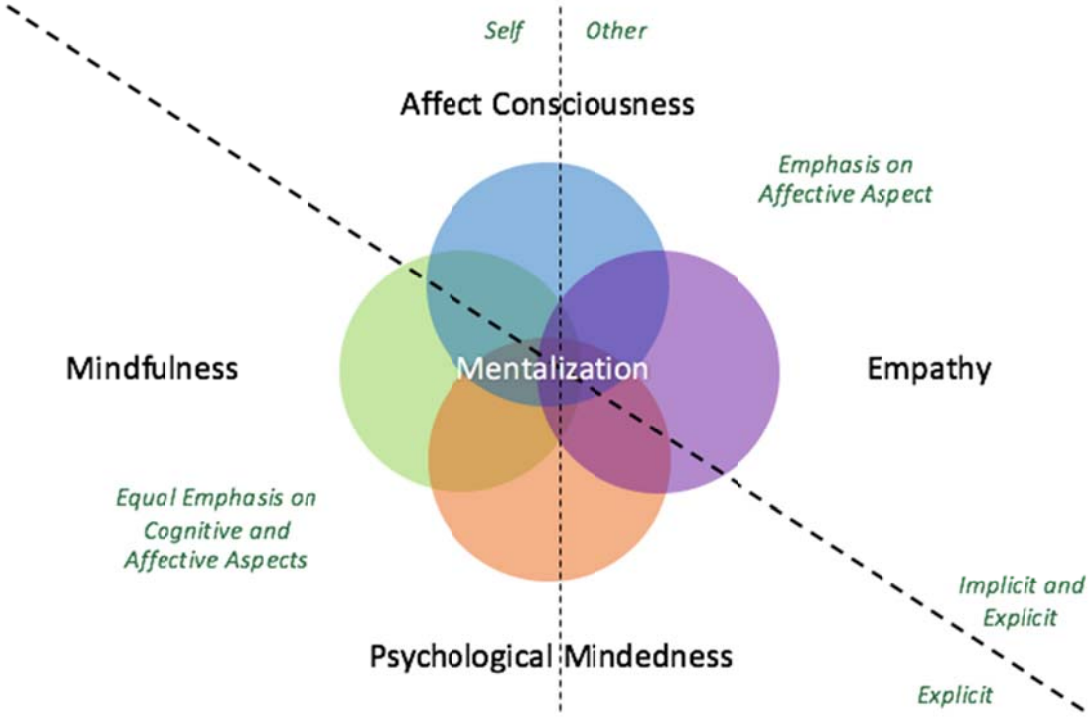

Figure 2: Venn diagram mapping the conceptual overlaps between mentalization and four related concepts including mindfulness, psychological mindfulness, empathy, and affect consciousness (all represented by the four circles). The lines divide the diagram according to the three-dimensions of mentalization (i.e., self-/other-oriented, implicit/explicit, and cognitive/affective). The lines are depicted with dashes to illustrate the non-absolute nature of these divisions.

Explicit (controlled) vs implicit (automatic) mentalizing

LeDoux (1989) suggested the bulk of cognitive and emotional processing occurs outside conscious awareness, and influences behaviour similarly. However, whilst social understanding does often occur 'in the blink of an eye' (Sharp, Fonagy & Goodyer, 2008) it can also occur in a more conscious way, such as asking a research participant to decipher the expression in the eyes of a photograph (Sharp, Fonagy & Goodyer, 2008).

This 'dual process' theory of cognition differentiates between automatic (implicit) processing and consciously-controlled (explicit) processing modes

(Chaiken & Trope, 1999). Explicitly-controlled processing is considered to be conscious, verbal, and interpreted. Implicit processing is considered to be an unconscious, somewhat automatic ability, to perceive our own and read others' mental states; this is thought to happen reflectively and largely outside of conscious control. An example of explicitly-controlled processing is one's evaluation of how another person's behaviour, for example their face expressions, suggest their mental state: "she looks pretty anxious"; an example of implicit processing is a growing belief, emotion or awareness that another person appears to experiencing an emotion or thoughts about a subject or person, including oneself: "I wonder if she loves me?"

Fonagy & Luyten (2009) have applied the 'dual process' theory of cognition to mentalization, as many psychological problems are believed to stem from a sensitivity/lower threshold for activation of the limbic system (the 'fight-flight' response) (Jogems-Kosterman et al., 2007). Further, initial explicit processing promotes limbic arousal which then shifts processing towards an implicit mode of mentalization (Lieberman, 2007). It has been observed that insecurely-attached adults find it more difficult to inhibit, when under stress, implicit mentalization (e.g. Edelstein & Gillath, 2008). The mentalization model (Fonagy & Luyten, 2009), in accounting for psychopathology and especially BPD diagnosis and trait-behaviours, offers the proposal that such heightened responses, particularly in the context of emotionally-significant interpersonal relationships, leads to a loss of (explicit) mentalization capacity and an excessive dependence on implicit processing, particularly in situations of peak arousal (Fonagy & Luyten, 2009).

Mentalization of self or another

Mentalization in relation to the self requires self-reflection, recognition and knowledge (Lieberman, 2007). The interpersonal aspects of social cognition involve recognition of others having thoughts and feelings that differ from our own. The ability draws on knowledge about the social world and how minds operate in order to inference as to the mental states of other people. However, these thoughts, feelings and perceived intentions are inevitably subjective and, as such, are not likely to be precise or accurate (Gilbert & Malone, 1995). In terms of mentalization, these processes of inference in relation to self and other are not independent; they are linked dynamically, such that the ability to identify and reflect on one's own thoughts and feelings allows predictions to be generated as to what another might be thinking and/or feeling; this is a recursive process (Choi-Kain & Gunderson, 2008). Mentalization of the self in these terms might be illustrated via a thought such as, "I feel sad; you must have hurt me", and mentalization of the other, "you're covering your eyes – you can't bear to look at me".

Affective vs Cognitive Mentalization

Cognitive mentalization relates to perspective-taking and mental state inference. Alternatively, affective mentalization describes the imagining of another's emotional experience, overlapping with emotional empathy (Baron-Cohen et al., 2008). The effective integration of cognitive and emotional mental state understanding is central to maximizing the likelihood of reaching the most accurate information available to the individual (Allen et al., 2008). Cognitive mentalization uses logic: "I think he thought Luke ate the chocolate"

whereas affective mentalization is concerned with emotion: “I feel upset about that.”

Internal vs external mentalization

A clear division has been identified in research studies between processes that are concerned with the internal experiences of ourselves and others (e.g. thoughts, feelings, desires) and those based on the ‘external’ social world and its physical characteristics, such as facial expressions (Fonagy & Luyten, 2009). This division is additional to self- and other- mental state processing and thus provides two further dimensions. An internal mentalization example is “I wonder if he felt his father hated him?” and of external mentalization, “he looks tired, perhaps he didn’t sleep very well?”

As such, mentalization can be considered in terms of both the internal and external experiences of the self, and of others. Links between mentalization deficits and BPD have been proposed (e.g. Fonagy and Luyten, 2009) in proposing that vulnerabilities to misinterpreting actions in mental-state terms may underlie core features of BPD. Empirical research has identified mentalizing problems associated with BPD in adults in respect of facial emotion recognition (Daros, Zakzanis and Ruocco, 2013) and complex social-cognitive processing (Priessler, Dzobiek, Ritter, Heekeren and Roepke, 2012).

2. Rationale

The identification and diagnosis of Borderline Personality Disorder in adolescence is a rapidly developing clinical and research field, and disordered mentalization is increasingly considered a key clinical component contributing

to the mental health difficulties component to the borderline description (Fonagy & Bateman, 2006; Sharp, Fonagy & Goodyer, 2008). A recent article has reviewed the literature in relation to clinical implications of BPD in adolescence (Sharp & Fonagy, 2015), but, to date, there has not been a systematic review of the empirical literature exploring the contribution of mentalization specifically to our understanding of BPD traits in adolescents.

3. Aims

This literature review aims to:

1. explore the evidence for specific deficits or failures in mentalization capabilities in adolescents presenting with either a diagnosis of BPD or presenting with significant BPD symptomology/trait behaviour;

And, as complimentary aims:

2. consider the range of potential options to assess mentalizing capabilities in adolescents with suspected BPD;

3. consider treatments for adolescents with BPD using mentalization-based intervention approaches.

4. Method

Inclusion Criteria

Studies were included for review if they met the following criteria:

1. Peer-reviewed studies reporting on original empirical research with adolescents where there was either a clear diagnosis of BPD or where the authors provided evidence and an assertion that traits/behaviours were consistent with BPD or emerging BPD, or the research was to investigate BPD traits and their association with mentalization.
2. Studies reporting on at least one feature of mentalization.

3. Studies included adolescent participants (12-18 years of age) in the clinical and, when involved, comparison groups.
4. The study was written in English.

Exclusion Criteria

Studies were excluded if:

1. Not published in the English language
2. Were primarily concerned with adolescent development in general, or focused on social cognition features of neurodevelopmental, or reported on other psychiatric or genetic conditions
3. Were reviews of previous research or theoretical positions
4. Study groups comprised mean age of 19+ years
5. Research abstracts and dissertation theses

Search Process.

Electronic database searches were conducted in October 2016 using four databases: OVID PsycInfo, and Medline, Web of Science, and University of Birmingham Full Text Journals) which identified 52, 33, 63 and 75 articles, respectively. The search included articles published between 1996- October 2016, and included all published journal articles referring to theory of mind or mentalizing and borderline personality disorder in adolescence (12-18 years inclusive). The search was completed using the terms: ('borderline personality disorder') AND (mentaliz$ OR theory of mind OR social cognition) AND (adolescen$). After duplicates were removed, the remaining titles and abstracts (n=123) were screened for eligibility. Backward searching was used,

such that the reference lists of included papers were examined to identify further possible studies. A total of 16 studies met criteria for inclusion.

The search strategy is shown in Figure 3.

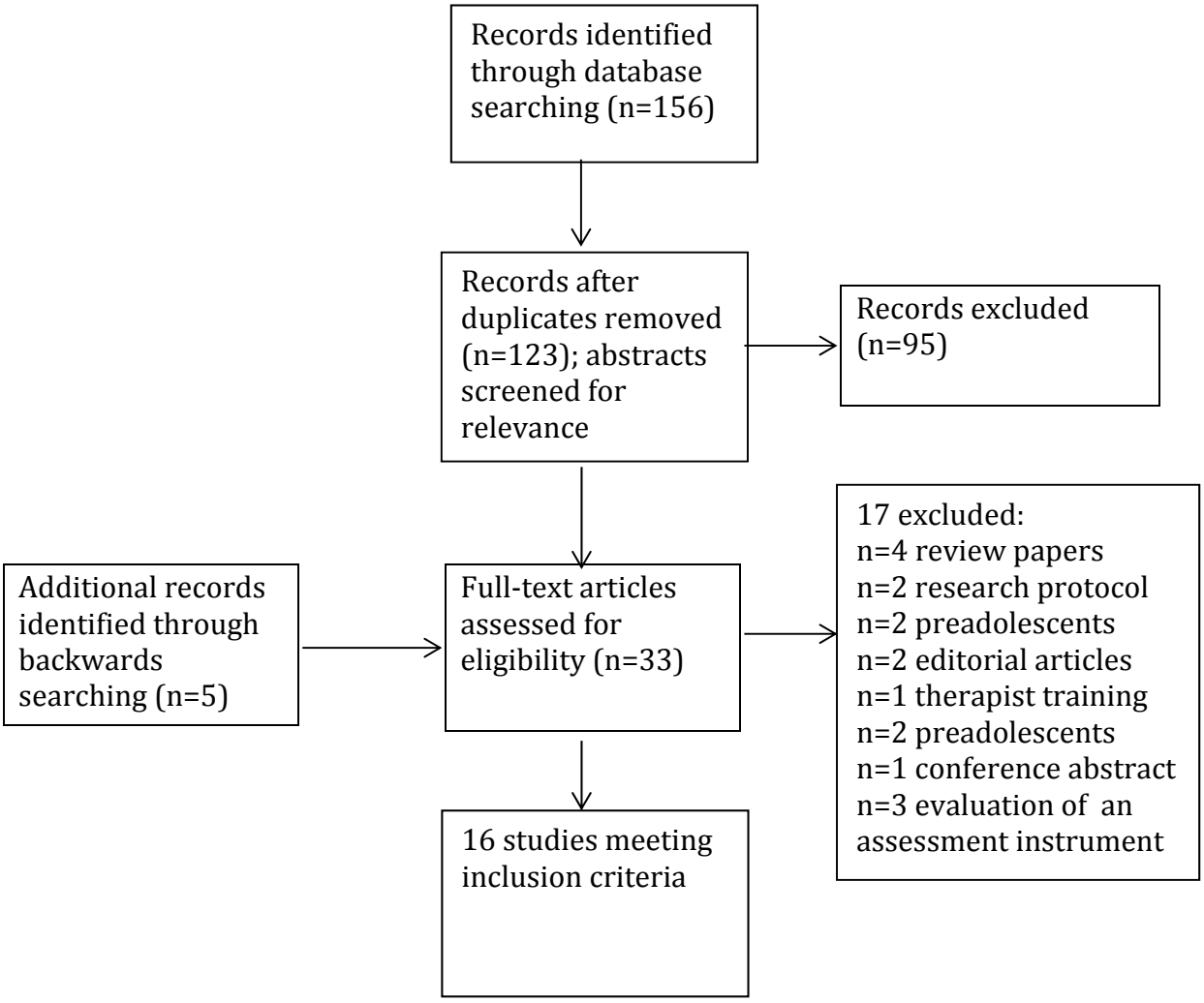

Figure 3: Systematic review process for selection of papers

Quality Assessment.

The included studies featured diverse research designs, so a suitable and appropriate quality assessment tool was used to review each of the papers for quality. The quality framework by Kmet et al. (2004) was used. The Kmet framework comprises 14 items that are scored dependent on the extent

that each criterion has been met (“yes”=2, “Partial”=1, “No”=0). Items that were not applicable to a study design were excluded and marked “n/a”; this item was then excluded from the calculation of the overall summary score. The summary score is given for each paper (Table 2) by totalling scores obtained across included items and then dividing by the total achievable score (i.e. 28 – (number of “n/a”’s x2) as recommended by the authors (Kmet et al., 2004). Total scores were then converted to a percentage score of the total achievable score for each paper. A score over 80% is considered strong quality; 60-79% is considered good quality; 50-69% of satisfactory quality; and below 50% is considered of poor methodological quality (Ghannouchi, Speyer, Doma, Cordier & Verin, 2016). Each of the 16 articles that met the inclusion criteria for the review was assessed using the Kmet framework, with a second rater rating a sample of three of the papers, with any discrepancies discussed. The Kmet quality framework Tables are reproduced in Appendix 1, and a summary table of the Quality Appraisals is given in Table 1.

Table 1: Summary of Kmet Quality Appraisal

	Kmet Criterion / Study (year of publication)	Ha, Sharp et al (2013)	Sharp, Ha et al. (2013)	Sharp, Pane et al. (2011)	Laurenssen et al. (2013)	Robin et al. (2012)	Roussouw & Fonagy (2012)	Fossati, Feeney, et al. (2011)	Jovev, Chanen, et al. (2011)	Scott, et al. (2011)	von Ceumern-Lindenstjerna, et al. (2010)	Fossati, Feeney, et al. (2014)	Berenschot, et al. (2014)	Kalpakci, et al. (2015)	Sharp, Venta, et al. (2016)	Bo, et al. (2015)	Roussouw (2015)
Quantitative Studies																	
1	Question / objective sufficiently described?	2	2	2	2	2	2	2	1	2	2	1	2	2	2		
2	Study design evident and appropriate?	2	2	2	2	2	2	2	1	2	2	2	2	2	2		
3	Method of subject/comparison group selection or source of information/input variables described and appropriate?	2	2	2	1	2	2	1	1	2	1	2	2	2	2		
4	Subject (and comparison group, if applicable) characteristics sufficiently described?	2	1	2	1	2	2	1	1	2	1	1	1	1	1		
5	If interventional and random allocation was possible, was it described?	n/a	n/a	n/a	n/a	n/a	2	n/a	n/a	n/a	n/a	1	n/a	n/a	n/a		
6	If interventional and blinding of investigators was possible, was it reported?	n/a	n/a	n/a	n/a	n/a	2	n/a	n/a	n/a	n/a	2	n/a	n/a	n/a		
7	If interventional and blinding of subjects was possible, was it reported?	n/a	n/a	n/a	n/a	n/a	2	n/a	n/a	n/a	n/a	0	n/a	n/a	n/a		
8	Outcome and (if applicable) exposure measure(s) well defined and robust to measurement / misclassification bias? means of assessment reported?	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
9	Sample size appropriate?	1	2	2	1	1	2	2	1	2	1	1	1	1	2		
10	Analytic methods described/justified and appropriate?	2	2	2	1	2	2	2	1	1	2	2	2	2	2		
11	Some estimate of variance is reported for the main results?	1	1	1	0	0	2	1	0	0	1	0	2	1	2		
12	Controlled for confounding?	n/a	n/a	n/a	n/a	n/a	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		
13	Results reported in sufficient detail?	2	2	2	1	2	2	1	1	1	1	2	2	2	2		
14	Conclusions supported by the results?	2	2	2	2	2	2	2	2	1	2	2	2	2	2		

Qualitative Studies																	
1	Question / objective sufficiently described?															2	2
2	Study design evident and appropriate?															1	1
3	Context for the study clear?															2	2
4	Connection to a theoretical framework / wider body of knowledge?															2	2
5	Sampling strategy described, relevant and justified?															1	1
6	Data collection methods clearly described and systematic?															0	0
7	Data analysis clearly described and systematic?															0	0
8	Use of verification procedure(s) to establish credibility?															0	0
9	Conclusions supported by the results?															2	2
10	Reflexivity of the account?															2	2
	Maximum Score possible	20	20	20	20	20	28	20	20	20	20	28	28	20	20	20	20
	Percent	90	90	95	65	85	93	80	55	75	75	64	64	85	95	55	55

Investigations into the role of mentalization in adolescents presenting with BPD trait behaviours and diagnoses are an emerging field of study and this is reflected in the number of included studies. The strongest evidence presented is for the influence of hypermentalization (i.e., excessive ToM) although these studies (1,2,4,5,7, above), whilst well designed and reported, are cross sectional and lacked comparison groups with non-clinical populations, thus the direction of relationship between mentalization abilities and BPD traits/symptoms cannot be determined, nor could the overall levels of mentalization between clinical and non-clinical samples be compared. There is only one double-blind, randomized trail included in this review (Roussouw & Fonagy, 2012) and this study did not feature adolescents with diagnosed BPD but had a primary research focus on the use of MBT-A with adolescents who self-harm. However, 75% of participants met the diagnostic threshold for BPD, hence its suitability for inclusion in this review. Studies 15 and 16 were scored as of satisfactory quality, 16 through being essentially a descriptive paper (it is acknowledged that this paper was illustrative of clinical problems and mentalizing practice/method with adolescents, rather than empirical research), and paper 15 did not state clearly the objectives of the project and the paper lacked clarity.

Descriptive Statistics

The review comprises 16 studies, published between 2010 and 2016, and consisted of 13 cross-sectional studies, 2 case studies, and one randomized control trial (RCT). It was not possible to calculate the total number of participants and gender ratio through the possible overlap of

samples used in a number of the included studies although this overlap was not made explicit (Ha, Sharp et al., 2013 and Sharp, Ha et al., 2013).

Six papers were from centres in the USA, two each from UK, Italy and the Netherlands, and one study from Australia, Denmark and Germany. One study was international and involved patients from six European countries. Twelve studies were based on clinical samples: seven studies were based on inpatient populations; three outpatient; and two studies included both in- and outpatients. Four studies were drawn from community samples investigating associations between an aspect of mentalizing and BPD traits. Five studies included female adolescents exclusively; the remainder were mixed with the exception of one study that did not specify gender (Sharp, Ha et al., 2013). Excluding the case study designs, study populations ranged from 11-259 for inpatient-based studies and 84-501 for community studies. Eleven studies used diagnostic interviews (10 clinical population studies, 1 community population study), the three other community studies used self-report questionnaires that assessed for BPD trait-behaviours and attitudes. The case studies did not describe clinical assessment instruments.

An overview of the 16 included studies, with relevant methodological characteristics and study conclusions, is shown in Table 2.

Table 2: Summary of included studies

Author year country[1]	Type of study	Participants and sample size if specified	Design of intervention studied	Measures	Outcome	Mentalization Construct Examined
Sharp et al 2013 USA	Cross Sectional	n= 164*; 62 girls, 49 boys (mean 15.5 years; SD 1.44) *(*) numbers in participants section stated 164; gender figure sum to 111*	pre-post study design	*Movie for the Assessment of Social Cognition (MASC, Dziobek, et al 2006);* Mentalizing Stories for Adolescents (Vrouva & Fonagy, 2009); Child Eyes Test (Baron-Cohen et al, 2001); Basic Empathy Scale (Joliffe & Farrington, 2006); The Childhood Interview for DSM-IV Borderline Personality Disorder (CI-BPD, Zanarini, 2003); The Borderline Personality Features Scale for Children (BPFSC, Crick, Murray-Close & Woods, 2005); Youth Self Report (YSR, Achenbach & Rescorla, 2001); Diagnostic Interview Schedule for Children (DISC; Shaffer, Fisher, Lucas, Duncan & Schwab Stone, 2000)	Demonstrated a significant positive relationship between hypermentalizing and borderline traits. Hypermentalizing reduced through milieu-based inpatient treatment	Explicit and implicit; Self and other; affective and cognitive; internal and external
Sharp et al 2011	Cross Sectional	N=111; age range 12-17 years; 62 girls, 49 boys (mean 15.5 years; SD 1.44)	pre-post study design	*MASC (Dziobek, et al 2006)*; BPFSC (Crick, Murray-Close & Woods, 2005); CI-BPD (Zanarini, 2003); YSR (Achenbach & Rescorla, 2001); Antisocial Process Screening Device (APSD, Frick and Hare, 2001); Difficulties in Emotion Regulation Strategies Scale (DERS, Gratz and Roemer, 2004); DISC (Shaffer, Fisher, Lucas, Duncan & Schwab Stone, 2000)	Significant positive relationship between hypermentalizing and borderline traits, a relationship mediated by difficulties with emotion regulation	Explicit and implicit; Other; Affective; Internal and external

[1] Author/year/country data were colour-coded according to the respective quality ratings stemming from the Kmet appraisal.

Author year country[1]	Type of study	Participants and sample size if specified	Design of intervention studied	Measures	Outcome	Mentalization Construct Examined
Laurenssen, Hutsebaut, Luyten and Verheul, 2013	Cross sectional	11 females with borderline trait behaviour. Age range 14-18 years	Interview and self-report	The Anxiety Disorders Interview Schedule for DSM-IV Child Version-Child Interview (ADIS-C, Silverman & Albano, 1996) Structured Clinical Interview for DSM-IV Axis I disorders (SCID-I, First, Spitzer, GiHa, Sharp et al (2013)on & Williams, 1997) The Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II, First et al, 1996) of *Outcome Measures: Brief Symptom Inventory (BSI, Derogatis, 1975) The Severity Indices of Personality Problems (SIPP-118, Verheul et al, 2008) Quality of Life EuroQol EQ-5D (EQ-5D, Brooks, Rabin & De Charro, 2003*)	Preliminary support for the effectiveness of an inpatient mentalization-based treatment for adolescents with borderline symptoms. Participants showed marked improvements in personality functioning and a higher level of quality-of-life at 12 months after start of treatment	Explicit and implicit; Self; Affective and cognitive; Internal
Robin, Pham-Scottez, Curt, Dugre-Le Bigre, Speranza, Sapinho, Corcos, Berthoz and Kedia, 2012	Cross-sectional: Comparison with matched controls	22 in-and out-patient female adolescents. Age Range 15 to 19 years. 22 control group adolescence matched for gender, age and socio-economic status	Experimental 2x 6 factorial design	Structured Interview for DSM-IV that personality (SIDP-IV, Pfohl et al, 1995) Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS, Kaufman et al, 1997) *Pictures of facial affect series (Ekman and Friesen, 1976)*	Results showed that the adolescents in the borderline group showed no impairment in identifying fully expressed emotions. Suggestion that borderline impairment is supple and occurs at low level of intensity only	Explicit; Self and other; Cognitive; Internal and external

Author year country[1]	Type of study	Participants and sample size if specified	Design of intervention studied	Measures	Outcome	Mentalization Construct Examined
Rossouw and Fonagy, 2012	Experimental: Compared clinical group with Treatment As Usual (TAU)	80 adolescents, randomly allocated to treatment group (MBT-A or TAU) Age range 12-17 years (mean age = 14.7 years). 85% of sample = female	Randomised Control Trial	*Risk-Taking and Self-Harm Inventory (RTSHI, Vrouva, Fonagy, Fearon & Roussow, 2010)* Childhood Interview for DSM-IV Borderline Personality Disorder (CI-BPD, Zanarini, 2007) Mood and Feelings Questionnaire (MFQ, Angold, Costello, Messer, Pickles, Winder and Silver, 1995) Borderline Personality Features Scale for Children (BPFS-C, Crick, Murray-Close and Woods, 2005. How I Feel Questionnaire (HIF, unpublished, 2008) Experience of Close Relationships Inventory (ECR, Brennan, Clark and Shaver, 1998)	Treatment shown to be significantly more effective than TAU in terms of reducing self-harm as well as depression (two common behavioural features of BPD)	Explicit and implicit; Self and other; Affective and cognitive; Internal and external
Fossati, Feeney, Maffei and Borroni, 2011	Cross-sectional	501 hjgh-school students (255 female; 246 male). Mean age 17.22 years (SB = 0.88)	Self-report inventory	Personality Diagnostic Questionnaire-4+ (PDQ-4+, Hyler, 1994) Attachment Style Questionnaire (ASQ, Feeney et al, 1994) *Mindful Attention Awareness Scale (MAAS, Brown & Ryan, 2003.*	Support for hypothesis that an emphasis on mindfulness/mentalizing may be a vital component in effective BPD treatment Suggestion that preoccupied/fearful insecure attachment may be linked to the development of a specific mentalization deficit.	Explicit; Self and other; Cognitive; Internal and external

Author year country[1]	Type of study	Participants and sample size if specified	Design of intervention studied	Measures	Outcome	Mentalization Construct Examined
Jovev, Chanen, Green, Cotton, Proffitt, Coltheart and Jackson, 2011	Cross-sectional Compared clinical group with community controls	20 outpatients (3 male, 18 female, mean age 18.9, SD=3.1 years); 20 controls (7 male, 13 female; mean age 20.40, SD=2.72 years)	Experimental task	Structured Clinical Interview for DSM-IV Axis I disorders (SCID-I/P: (First et al., 1997b) Diagnostic Interview for DSM-IV Personality Disorders (DIPD) (Zanarini et al., 1996). Structured Clinical Interview for DSM-IV Axis I Disorders Non-patient Edition (SCID-I/NP (First et al., 1996); McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD: (Zanarini et al., 2003) ;Structural Clinical Interview for DSM-IV Axis II Disorders Personality Questionnaire (SCID-II PQ: (First et al., 1997a).; *Face Morph Task. (Blair et al. (2001) utilising Ekman images (Ekman and Friesen, 1976)).*	The BPD group showed no evidence of heightened sensitivity to emotional facial expressions compared to community controls. Conclusion emotional sensitivity might not be apparent early in the course of BPD.	Explicit; Other; Cognitive; External
Von Ceumern-Lindenstjerna, Brunner, Parzer, Mundt, Fiedler and Resch, 2010	Cross sectional Clinical group compared with clinical comparison group and 'healthy comparison' group	30 female adolescents (13-19 years) with BPD diagnosis; 29 female adolescents with mixed psychiatric diagnoses; 30 female controls	Experimental task	Symptom checklist 90 Revised (Franke, 1995); *Visual Dot-probe task (MacLeod, Mathews & Tata, 1986)*	Data regarding positive stimuli showed that BPD is not associated with a specific orienting to positive faces. Both BPD and adolescent psychiatric group showed a strong orienting to negative emotional stimuli	Explicit; Other; Cognitive; External

Author year country[1]	Type of study	Participants and sample size if specified	Design of intervention studied	Measures	Outcome	Mentalization Construct Examined
Fossati, Feeney, Maffei and Borrina, 2014	Cross-sectional	89 non--clinical adolescents, drawn from 1157 adolescents (mean age of 16.7 years, SB = 1.71 years)	Self-report inventory	*RET (Baron-Cohen et al., 2001), Attachment Style Questionnaire (ASQ; Feeney et al., 1994), DERS (Gratz & Roemer, 2004)*	High-BPD trait adolescents scored significantly lower than low-trait BPD adolescents on the RET, and significantly higher than average and low BPD groups on the DERS LEC. High-BPD showed no significant difference from other groups on mentalization measures	Explicit; Self and other; Affective and cognitive; External
Fossati, Feeney, Maffei and Borrina, 2014	Cross-sectional	89 non--clinical adolescents, drawn from 1157 adolescents (mean age of 16.7 years, SB = 1.71 years)	Self-report inventory	*RET (Baron-Cohen et al., 2001), Attachment Style Questionnaire (ASQ; Feeney et al., 1994), DERS (Gratz & Roemer, 2004)*	High-BPD trait adolescents scored significantly lower than low-trait BPD adolescents on the RET, and significantly higher than average and low BPD groups on the DERS LEC. High-BPD showed no significant difference from other groups on mentalization measures	Explicit; Self and other; Affective and cognitive; External
Scott, Levy, Adams, and Stevenson, 2011	Cross-sectional	84 undergraduate psychology students. High-BPD group, type N = 38. Mean age 19.63 years, SD = 2.82 years Low-BPD group, at N = 46 Mean age 18.85 years, SD 1.26 years.	Experimental test	21-item modified version of MSI-BPD (Zanarini et al., 2003); PANAS (Watson, Clark, & Tellegen, 1988); State–Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983); *Reading the Mind in the Eyes (RME) task (Baron-Cohen et al., 2001)*	High-BPD group performed better for negative stimuli, also a response by us for attribute in negative mental states to facial stimuli. Suggestion that BPD traits may be associated with enhanced ability to detect negative emotions.	Explicit; Other; Cognitive; External

Author year country[1]	Type of study	Participants and sample size if specified	Design of intervention studied	Measures	Outcome	Mentalization Construct Examined
Ha, Sharp, Ensink, Fonagy and Cirino, 2013	Cross-sectional	146 adolescents, mean age 15.57 years (SD = 1.39 years)	Self-report inventory	*Reflective Function Questionnaire for Youths (RFQY; Sharp et al., 2009);* Child Reflective Function Scale (CRFS; Target et al., 2001); Movie for Assessment of Social Cognition (MASC; Dziobek et al., 2006); Child's Eyes Test (CET) Baron-Cohen et al., 2001; Basic Empathy Scale (BES, Jolliffe & Farrington, 2006); Borderline Personality Features Scale for Children (BPFSC; Crick, Murray-Close, &Woods, 2005); Diagnostic Interview Schedule for Children – Computerized version (NIMH DISC-IV; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000)	Significant positive associations between interview-based measure reflective function and experimental-based assessment of mentalization; adolescents with BPD demonstrated significantly poor reflective function compared to clinical comparisons without BPD.	Explicit and implicit; Self and other; affective and cognitive; internal and external
Berenschot,. van Aken, Hessels, Orobio de Castro, Pijl, Montagne,and van Voorst 2014	Cross sectional Clinical group compared with clinical comparison group and 'healthy comparison' group	42 adolescents with BPD (34 female, 8 male, age 12-18 years) 111 healthy adolescents (54 male, 57 female, age range 12-18 years) and 28 non-PD clinical group (13 female, 15 male; age range 12-18 years)	Experimental task	*Emotion recognition task (ERT) (Montagne B, Kessels RPC, De Haan EHF, Perrett D, 2007)*	Adolescents with "personality pathology" showed an enhanced recognition accuracy (p=0.02) of facial emotional expressions compared to healthy adolescents and psychiatric controls without personality pathology	Explicit; Other; Cognitive; External

Author year country[1]	Type of study	Participants and sample size if specified	Design of intervention studied	Measures	Outcome	Mentalization Construct Examined
Kalpakci et al (2015)	Cross-sectional	252 female adolescent inpatients with (n=107) and without BPD (n=145) aged 12-17 years	Cross sectional	*Childhood Interview for Borderline Personality Disorder (CI-BPD; Zanarini, 2003)*; Computerised Diagnostic Interview Schedule for Children (C-DISC; Shaffer et al, 2000); Basic Empathy Scale (BES, Jolliffe & Farrington, 2006); Movie for Assessment of Social Cognition (MASC; Dziobek et al., 2006); Difficulties in Emotion Regulation Strategies Scale (DERS, Gratz and Roemer, 2004); Child Behavior Checklist (CBCL; Achenbach, 1991)	In both study groups, emotion dysregulation significantly related to increased cognitive empathy; hypermentalizing related to decreased cognitive empathy in patients with BPD (p=0.01) but not to either type of empathy in non-BPD patients.	Explicit and implicit; Self and other; affective and cognitive; internal and external
Sharp, Venta et al (2016)	Cross-sectional	259 adolescent inpatients, mean age 15.42 (SD 1.43 years)	Interview, experimental task and self-report	*Movie for Assessment of Social Cognition (MASC; Dziobek et al., 2006);* Borderline Personality Features Scale for Children (BPFSC; Crick, Murray-Close, &Woods, 2005); Difficulties in Emotion Regulation Strategies Scale (DERS, Gratz and Roemer, 2004); Youth Self Report (YSR, Achenbach & Rescorla, 2001); The Child Attachment Interview (Target, Fonagy, Shmueli-Goetz, Data, & Schneider, 2007)	Hypermentalizing and emotional dysregulation mediated relationship between attachment and borderline features, although this effect was driven by hypermentalizing.	Explicit and implicit; Self and other; affective and cognitive; internal and external

Author year country[1]	Type of study	Participants and sample size if specified	Design of intervention studied	Measures	Outcome	Mentalization Construct Examined
Bo, Sharp, Fonagy & Kongerslev (2015)	Descriptive Study	2 individual case study examples from individual MBT-A (female and male both aged 17 years); 3rd case study of MBT-A group (7 females aged 16-18 years)	Cohort study	*Not given*	Case vignettes illustrate the rationale for addressing hypermentalizing and epistemic mistrust as treatment targets within MBT-A	Explicit and implicit; Self and other; affective and cognitive; internal and external
Roussouw, 2015	Descriptive Study	Case study of 16 year old female inpatient	Cohort study	*Not given*	Gradual progress against MBT-A therapy goals; patient remained perfectionist although was able to reframe; patient re-engaged in education	Explicit and implicit; Self and other; affective and cognitive; internal and external

5. **Results**

The papers reviewed explored mentalization deficits along a number of themes, with some overlap in their discussion and conclusions. Accordingly, the results will be reviewed according to the aims of the review as highlighted earlier.

What is the evidence for specific deficits or failures in mentalization amongst adolescents presenting with BPD diagnoses and significant BPD symptomology/trait behaviour?

Face Emotion Processing

Five papers were primarily concerned with experiments that tested an explicit/other form of mentalizing, via recognition and registration of facial emotions (Berenschot et al., 2014; Fossati, Feeney et al., 2014; Robin et al., 2012; Scott et al., 2011; von Ceumern-Lindenstjerna et al., 2010) all via computer-administered experimental tasks. Computer-administered tasks included the face morph task (Berenschot et al., 2014; Robin et al., 2012*)* and the Reading the Mind in the Eyes Test (RET; Baron-Cohen, 1985). Three out of the five studies found that adolescents with a diagnosis of BPD or who exhibited BPD traits (behaviourally and/or cognitively) were significantly more likely to be sensitive to facial emotion registration at lower levels of sensitivity than typical peers (Berenschot et al., 2014; Robin et al., 2012; von Ceumern-Lindenstjerna et al., 2010). These studies suggest that adolescents with BPD may show an increased sensitivity to recognizing and processing facial emotions. In addition, Von Ceumern-Lindenstjerna et al. (2010) found, in their study sample of females with a diagnosis of BPD, a specific sensitivity to negative emotions (i.e., anger and disgust) on initial registration or

presentation of the face stimuli, although the study group was relatively small. Fossati, Feeney et al. (2014) in examining for accurate reading of emotions in the eye region of the face found that their “high-BPD” trait group scored significantly lower on the RET than their “average” and “low-trait BPD” groups, suggesting that high BPD trait behaviour is associated with poor facial emotion recognition, which is considered an explicit/other form of mentalizing.

Further, Scott et al. (2011) in reporting sensitivities to negative facial emotion stimuli (e.g. anger, disgust) in a large (non-clinical) sample of college students hypothesized that this sensitivity to emotions in faces in the “high-BPD traits” group may represent “an overlearned response set resulting from an accumulation of negative interpersonal experiences such as through child abuse and neglect”, drawing on the evidence for the external/other mentalizing function of maltreated children (e.g. Pollack & Sinha, 2002; Zanarini, 2000).

Across the five studies that explored explicit/other forms of mentalising (Berenschot et al., 2014; Fossati, Feeney et al., 2014; Robin et al., 2012; Scott et al., 2011; von Ceumern-Lindenstjerna et al., 2010) the authors commented on the likelihood of a developmental influence generally on the obtained results, for example Fossati et al. (2014) found that their non-clinical adolescent comparison group scored significantly lower on the RET test than all adult non-clinical groups that have been reported in the literature (Baron-Cohen et al., 2011; Domes et al., 2007). These results infer comparison group adolescents show poorer ToM abilities than typical adult populations, perhaps supporting the suggestions that adolescents in general are “a bit borderline” especially given the developmentally-associated lability in mood characteristic

of the adolescent phase (Paris, 2014). There was a consensus across the five studies that looked at emotion processing in faces that the findings could link to the typical problem behaviours that characterise BPD, with Scott et al. (2011) concluding that “it seems important for researchers to investigate domains of social cognition other than emotion recognition in order to better understand these processes as putative mechanisms underlying BPD.” In summary, the findings from studies investigating facial emotion processing consistently showed significant differences between adolescents with a diagnosis or high BPD-trait behaviours and typical peers, whether in terms of recognition accuracy or sensitivity to the emotions being communicated in the experimental stimuli. These papers were of a satisfactory - good quality and so there can be confidence in the strength of these findings.

Integration between higher- and lower-order social cognitive systems

Two papers investigated the disconnect or dissociation of the ‘dual process’ model (Chaiken & Trope, 1999) between external, other-person forms of social cognition (e.g., face emotion processing) and the automatic, implicit levels of processing (Fossati, et al., 2014; Kalpakci et al., 2015). Kalpacki et al. (2015) investigated if emotional dysregulation and hypermentalization (Sharp, 2014) accounted for the ‘double dissociation’ (Harari et al., 2010) between cognitive and affective empathy in female adolescents with BPD. The double dissociation refers to the finding by Harari et al. that adult patients with BPD showed higher affective than cognitive empathy in contrast to community controls. While the Kalpacki study only partially replicated the earlier study findings from Harari et al. (2010), such that female adolescents with BPD showed significantly higher affective

empathy than female inpatients without BPD, there were no differences between the groups in respect of findings related to cognitive empathy. Therefore the study contributes to a suggestion from other studies with adolescents presenting with other psychiatric disorders (Dziobek et al., 2011; Maurage et al., 2011) that affective empathy is higher than cognitive empathy across psychiatric conditions in adolescence generally.

Fossati and colleagues' (2014) study identified an association between BPD features (i.e. as measured through the Difficulties in Emotion Regulation Scale (DERS, Gratz & Roemer, 2004) and difficulties in the mental representation of affective states, mediated also by attachment style. This study, conducted with a normative sample of Italian non-clinical adolescents, found significant deficits in the Theory of Mind of other people's affect states (i.e. external/other conscious cognition) amongst their "high-BPD" group although primarily for 'negative' emotion states (p.58). Sharp, Venta et al. (2016) observed also that attachment insecurity may also play a role in derailing the process of optimal mentalizing. Sharp and van Woerden (2015) suggest such studies specify an inability of the conscious, controlled mentalizing system to modulate information perceived via the automatic, implicit system and that this disconnect impairs performance on complex social-cognitive tasks that may evoke high emotional arousal. In summary, the Kalpacki et al. (2015) study offers the most rigorous support to the dual process model amongst adolescents with BPD as the study group comprised patients with clinical diagnoses and the assessments used sampled participants' 'online' processing of social situations, in comparison with the Fossati et al. (2014) study that was based on a non-clinical population and

was examining for BPD trait but through self-report measures. Both papers were of acceptable quality according to Kmet criteria.

Excessive Theory of Mind (ToM) or Hypermentalizing

Seven papers focused on Sharp & Vanwoerden's (2015) hypermentalizing model of impairment as a critical impairment of adolescents with BPD diagnoses or traits (Bo et al., 2015; Ha, Sharp et al., 2013; Roussouw & Fonagy, 2012; Sharp, Pane et al., 2011; Sharp, Ha et al.,2013; Kalpakci et al.,2015; Sharp, Venta et al., 2016). Hypermentalizing has been defined by Sharp et al. (2011) as social-cognitive processing when an individual attributes intentions, ideas, wishes and beliefs to other people in the absence of objective evidence to support such beliefs and attributions. Studies included in this review generally explored the mechanisms and interactions/intermediary variables that underlie the social cognitive processes that lead to hypermentalization and how, in turn, it should be regarded as a core impairment within BPD. All six studies that explored hypermentalizing were cross sectional, so cause-effect relationships between hypermentalizing and BPD behaviours/symptoms cannot be inferred. Ha et al. (2013) reported a significant negative relationship between high hypermentalization and low reflective function, the latter being also a construct within attachment research, indicating that those adolescents who achieved a high hypermentalizing score tended to show low reflective functioning capacity. The Sharp et al. (2011) study was the first to use an 'online' (Sharp & van Woerden, 2015) ToM task, the Movie for the Assessment of Social Cognition (MASC, Dzobiek et al., 2006), observing that in their sample of inpatient adolescents with a diagnosis of BPD that participants utilized 'unusual

alternative strategies' (i.e. hypermentalization) above a loss of ToM per se. These alternative strategies included making overly complex inferences of social situations via the MASC video assessment task. Further, Sharp and colleagues (2011) concluded that adolescents with BPD tended to show (via their MASC scores) a vicious cycle whereby emotional dyregulation was seen to promote hypermentalization, which in turn fuelled yet further heightened emotional dysregulation. Thus, interesting findings have been reported from those studies using assessment tools that sample the 'real-life' demands of the 'online', in-the-moment social-cognitive processing that underpins mentalizing.

Hypermentalizing deficits are identified as a potential treatment target amongst adolescents with BPD pathology (Sharp, Ha et al, 2013; Sharp, Venta et al, 2016) and self-harm (Roussouw & Fonagy, 2012). Bo et al. (2015) elaborated on Sharp's (2014) model in highlighting that hypermentalizing is a useful concept in understanding mentalizing problems when an individual is (1) in a high state of emotional arousal, (2) unable to differentiate between self and other as regards mental states, (3) unable to integrate cognitive and emotional mentalizing, and finally experience the 'dissociation'/disconnect between the automatic and explicit mentalizing functions (Bo et al., 2015). While the Bo et al. (2015) paper is of poor quality according to the Kmet criteria, the remainder were appraised as being of good quality and so there can be confidence in the robustness of these findings.

Role of attachment

Research has supported a link between attachment insecurity (AI) and BPD pathology both in cross-sectional studies (Levy et al., 2005) and

longitudinally (Carlson, Egeland and Sroufe, 2009). Linehan (1993) asserted that BPD is primarily a disorder of emotional regulation arising from an interaction of biological and environmental vulnerabilities (e.g., an invalidating environment). Such assertions are harmonious with developmental research into attachment (e.g. Cassidy, 1994).

Three papers considered the role of AI in the ontogenesis of BPD features (Fossati et al., 2011; Fossati et al., 2014; Sharp et al., 2016) and all identified an influence of AI in BPD phenomenology. Fossati et al. (2011) highlighted a correlation between attachment disturbance and BPD features and, within their data, identified that fearful/ambivalent insecure attachment style may be linked to the development of mentalizing deficits, that they termed low dispositional mindfulness and which they defined as ‘a poor capacity for keeping one’s consciousness alive to represent reality’ (Wupperman, Neumann & Axelrod, 2008). Fossati and colleagues expanded on this theorem in 2014 in the light of their study of high-school students that demonstrated adolescent participants (who exhibited poor mentalization when stressed) also tended to display insecurity about relationships. However, this study was based on self-report questionnaire measures of mindfulness, that the authors consider an aspect of mentalizing function. Bo et al. (2015) tested the developmental model of BPD proposed by Fonagy & Luyten (2009) that attachment insecurity ‘derails’ the optimal developmental of mentalizing capabilities and found that the link was significantly driven, as previously, by hypermentalizing.

In summary, papers in this review confirm previous research and theoretical positions that attachment insecurity is linked to BPD trait

behaviour. Further, deficits across a range of aspects of mentalizing skills and abilities are active influences in the intense difficulties with emotional regulation, interpersonal perception and feelings of insecurity in relationships that are component to BPD. All three papers were evauated as being of good quality according to the Kmet quality appraisal.

What instruments have been used to assess the mentalizing functioning of adolescents with suspected or diagnosed BPD?

Hypotheses concerned with mentalization dysfunction as central to the understanding of the social-cognitive impairments of BPD are fairly recent in being posited (e.g., Fonagy & Bateman, 2008). In investigating this theoretical approach, a further challenge has been with regard to appropriate and valid measurement (Sharp et al.,2011). There are inherent problems in using many of mentalizing tasks developed over the last three decades as they have been developed to assess the ToM development of younger children, or specific clinical groups (e.g., autism spectrum disorder), which can result in ceiling effects either on account of age or clinical diagnosis (Sharp et al., 2011). Although more advanced tests have been developed and some have been employed in the studies included in this review, they measure singular constructs of the mentalizing domain and cannot address the impact of everyday social cognition on the individual (Sharp et al., 2011).

Assessments measuring external/other, conscious mentalizing.

Six studies used an experimental task as the primary tool to assess mentalizing function in their respective study groups; all studies focused on emotion recognition and sensitivity in facial expressions. Two studies (Scott et al., 2011; Fossati et al., 2014) used the Reading the Mind in the Eyes Test

(Baron-Cohen et al., 2001), two studies (Robin et al., 2012; Jovev et al., 2011) used the Face Morph Task (Ekman & Friesen, 1976); one study (von Ceumern-Lindenstjerna et al., 2010) utilized the visual dot probe classification task (Bradley, Mogg, Falla & Hamilton, 1998) and one study (Berenschot et al., 2014) the Emotion Recognition Task (Montagne, Kessels, De Haan & Perrett, 2007). All studies were of an acceptable quality based on the Kmet appraisal.

Five of the above studies require the 'reading' of facial emotion as the experimental variable in determining mentalizing ability and this is not surprising as the development of objective scoring systems in relation to facial affect has influenced research in this area (Ekman, Friesen, & Tomkins, 1972). There are mixed results among the reported studies; Robin and colleagues (2012) reported a decreased sensitivity to facial emotions of anger and happiness (sensitivity being defined as detection of these emotions prior to being visually "fully expressed") in their study of female adolescents with a diagnosis of BPD. Results of the Jovev et al. (2011) study concurred. In contrast, von Ceumern-Lindenstjerna et al. (2010), Berenschot et al. (2014) and Scott et al. (2011) found heightened sensitivity amongst adolescents with BPD, notably for negative emotions. Further, von Ceumern-Lindenstjerna et al. (2010), studying female inpatients with BPD, found that initial orientation to negative faces to be significantly more sensitive than comparison adolescents with psychiatric diagnoses and a community sample. Overall, there were mixed results in respect of sensitivity to facial expressions of emotion, with most studies reporting heightened sensitivity to 'negative' emotions (such as anger and disgust) at earlier stages of expression.

Self-Report Questionnaires

Three studies used a self-report instrument to assess mentalization (Fossati et al., 2011; Ha et al., 2013; Roussouw & Fonagy, 2012;) with the measures correlating significantly positively with BPD pathology/behaviours or diagnosis as measured through diagnostic schedules (e.g., Difficulties in Emotion Regulation Scale (DERS, Gratz & Roemer, 2004). Roussouw & Fonagy (2012) used the How I Feel Questionnaire (HIF) to assess mentalization. The HIF is based on unpublished data although the authors do not describe this measure in any detail. Fossati et al. (2011) used the Mindful Attention Awareness Scale (MAAS, Brown & Ryan, 2003) acknowledging that this questionnaire focused on explicit (i.e. conscious) mindfulness and, hence, a form of mentalization. These authors found a significant association between attachment disturbances and BPD features in a sample of non-clinical adolescents. Ha et al. (2013) evaluated the Reflective Functioning Questionnaire for Youth (RFQY) reporting that the RFQY might be a valid and reliable (and time-efficient) measure of reflective function/mentalization in adolescents. There is agreement across the studies, in support of Sharp and colleagues (2011) view, that measures of social cognition can struggle to measure 'online' social cognitive (e.g. real-life) demands and hence risk failing to tap into the mentalizing impairments experienced by individuals with BPD, although the Ha et al. (2013) study correlated significantly with the MASC (Dzobiek, 2006) suggesting better sensitivity. Thus self-report questionnaires to assess for BPD should be used with caution especially as standalone

assessments and ideally should be combined in clinical assessment with interview and ‘online’ measures of social cognition. However, the studies reporting the use of self-report questionnaires were of an acceptable quality.

Movie for the Assessment of Social Cognition (MASC, Dziobek et al, 2006)

Four studies used the MASC (Sharp et al., 2013; Sharp et al., 2011; Kalpakci et al., 2015; Sharp et al., 2016) to examine participants’ reactions to demands of everyday cognition via a number of video vignettes. All studies were of an acceptable quality according to Kmet criteria. Currently the MASC appears to be the only realtime/online assessment of mentalizing (i.e., one that samples the automatic/implicit social cognition impairments that characterises BPD pathology). Examples of the video vignette scripts used in the MASC are given as a supplement to Sharp et al. (2011), which is the first study to employ this assessment instrument with an adolescent population.

Further, Ha et al. (2013) used the MASC primarily as a hypermentalizing measure in evaluating the RFQY above and reported high hypermentalizing scores on the MASC was related to a low reflective function questionnaire on the RFQY. Sharp et al. (2013) reported a clear relation between BPD traits and MASC hypermentalizing, although not with the other measures of (explicit/external) social cognitive reasoning they used, e.g. the RET and the Mentalizing Stories Test for Adolescents (Vrouva & Fonagy, 2009). Kalpakci et al. (2015) found that MASC hypermentalizing related to lower cognitive empathy in BPD adolescent patients, but was not related to cognitive or affective empathy in the non-BPD group, and suggest this may indicate an increased relevance of hypermentalizing as it relates to empathy in BPD. Bo

et al. (2015) hypothesised a meditational effect between attachment coherence (i.e., a coherent account of attachment relationships) and BPD features, as measured via the MASC.

The MASC investigates real-time/online mentalizing and has helped place the 'offline' mentalization impairments demonstrated by the studies of facial emotion processing problems into context in terms of day-to-day interpersonal functioning. However, the MASC is yet to be used with non-clinical populations and this is clearly desirable especially given the developmental propensity for adolescents generally towards labile and intermittently emotionally volatile functioning and cognition.

What treatments are available for adolescents with BPD using mentalization-based intervention approaches?

In-patient milieu treatment

Two studies (both of satisfactory-good quality, according to Kmet criteria) found evidence of tentative support for an in-patient milieu environment for treating adolescents with BPD using a focus on hypermentalizing and social cognitive difficulties (Sharp et al., 2013; Laurenssen et al., 2013) with Laurenssen and colleagues demonstrating lasting positive effects to 12 months follow-up of an outpatient adaptation of MBT-A. Sharp et al. (2013) detail the components of milieu-based treatment to include a focus on relationships with patients, with staff providing structure and discipline, help with daily living tasks and extensive involvement in the negotiation of emotional and behavioural challenges as they occur. Specialised groupwork is also component to the milieu model, focusing on key domains such as

sexuality, gender, emotion regulation, in addition to a specific focus on developing and enhancing mentalizing skills via groupwork.

Mentalization Based Treatment for Adolescents (MBT-A).

Four studies feature MBT-A (Laurenssen et al., 2013; Roussouw & Fonagy, 2012; Bo et al., 2015; Roussouw, 2015). Roussouw & Fonagy (2012) describe MBT-A as "..a year long manualized psychodynamic psychotherapy program with its roots in attachment theory…". It involves a combination of individual sessions and a monthly mentalization-based family therapy session, the frequencies of each depending on the programme and whether conducted on an inpatient or outpatient basis. MBT-A programs have a general aim to develop the adolescent's capacity to represent the feelings of themselves and others especially in emotionally challenging contexts. Bo et al. (2015) used case examples to illustrate the impact on interpersonal cognition when an individual fails to differentiate (or integrate) explicit (conscious) and implicit (automatic) mentalizing, resulting in hypermentalizing. In turn, this drives acute feelings of suspicion as to the intentions, wishes and desires of others, which the authors term epistemic mistrust (p.10) that Sperber et al. (2010) describe as "trust in the authenticity of interpersonal transmitted knowledge".

Roussouw & Fonagy's (2012) randomized controlled trial of MBT-A demonstrated significantly increased effectiveness over Treatment As Usual (TAU) in decreasing depression and self-harm over a 12-month period; the effects were attributed to improved mentalization (through the MBT-A treatment protocol, which was not offered to the TAU group) and reduced attachment avoidance. Although titled as a study for adolescent self-harm, three-quarters of the study group met the diagnostic criteria for BPD. The

authors also reported a reduction in risk-taking behavior (e.g. alcohol and substance use), with no other study to that point having demonstrated a positive effect on such behaviours. Roussouw (2015) described a single case study of a young woman (aged 16 years) to illustrate how increasing an individual's ability to mentalize (via the MBT-A treatment that comprises a combination of individual and family-centred MBT-informed therapy) promoted curiosity about her own mind as well as about the minds of others. Developing a mindful approach (described as pausing to "…mentalize the moment.." was found to promote impulse control and affect regulation, two central BPD symptom-behaviours. The paper aimed to describe the profile and treatment of young people with BPD and avoidant personality disorder and used a case study to illustrate mentalization-based treatment for these clinical problems. In this respect the paper contributes detailed examples of the clinical issues and treatment barriers presented in this area.

Laurenssen et al.'s (2013) study of inpatient female adolescents (N=11) was framed as a feasibility study and reported medium to large effect sizes with significant decreases in BPD symptoms and improvements in personality functioning and quality of life at 12-month follow-up. Laurenssen et al. (2013) advocated MBT-A on an outpatient basis when possible to reduce possible iatrogenic effects of inpatient treatment. The results are promising in terms of large effect sizes although the authors acknowledge that the small sample size meant it was not possible to control for potential moderators of treatment (e.g. pretreatment variables such as initial severity of presentation, socio-economic status, abuse status, etc). Quality of the studies was mixed from poor – good according to Kmet criteria.

Mentalizing of Explicit (conscious) Stimuli

Two studies (both of satisfactory quality) observed that treatment for the misidentification of emotional stimuli (Berenschot et al., 2014; Robin et al., 2012;) may be a relevant treatment component, and the MBT-A treatment model supports these comments. In also advocating for early identification of such problems, Robin et al. (2012) suggested that such therapeutic training could help to delay or reduce clinical morbidity. Berenschot et al. (2014) suggested that therapists should be vigilant to the increased sensitivity of adolescents with BPD pathology to recognizing facial emotions and to direct therapeutic interventions towards helping patients correctly interpret others' emotions and then to regulate both their own arousal and interpretations of others' mental states in response, although they do not offer a therapeutic mechanism or modality to support this suggestion.

In summary, the review papers that have reported on treatments have wholly been those focusing on reducing hypermentalizing or using MBT-A to promote greater emotional-regulation, improved interpersonal skills and reducing self-harm. Studies report mixed outcomes although improved over TAU; results testify to the promise shown through using mentalizing treatments yet also that the BPD comprises a complex and often entrenched set of behavioural, emotional and social problems that are resistant to therapeutic inputs. Face emotion studies offer some tentative commentaries to possible treatment targets, and only Kalpacki et al. (2015) to date have considered the interplay between explicit/external assessment tasks and those that measure automatic, unconscious aspects of mentalizing function.

6. Discussion

This review identifies that impaired mentalizing, especially in the form of hypermentalizing, often exerts an influence upon the core problems and behaviours found in adolescent BPD. Studies confirm that both external/conscious and internal/automatic mentalizing process contribute to the mentalizing distortions found in diagnosed and 'high-risk' individuals with a propensity for individuals with BPD to show accelerated processing from external to internal social cognitive stimuli (the 'dual process' model).

The studies that evaluated mentalization-based treatments for adolescents with BPD were predominantly conducted with inpatient populations. This is not surprising given the complex and intractable nature of the condition. However, there is preliminary evidence of efficacy via an outpatient model (Laurenssen et al., 2013) with an acknowledged pilot study of MBT-A adapted for an outpatient population. It is not known how this model might be developed so as to intervene earlier in the development of suspected BPD clinical presentations.

Although this review includes studies of non-clinical adolescent populations (i.e. Fossati et al., 2011, 2013) to investigate BPD-trait cognitive and emotional patterns, to date there have not been studies conducted to investigate typical adolescent responses to 'online' assessments of mentalization, e.g. MASC (Dzobiek et al., 2006). This is an important area for future research especially given the tendency in the age-group to labile emotional experiences and a suspected developmental-stage effect (Paris, 2014).

Methodological Considerations

The present literature review examined the role of mentalizing in understanding Borderline Personality Disorder in adolescence, in terms of what metalizing abilities have been found to be associated with BPD, how mentalization can and has been assessed, and whether treatments purporting to intervene on mentalization abilities lead to good or other outcomes. The 16 papers reviewed identified mentalization deficits in the domains of social-cognition, specifically: facial emotion processing; excessive theory of mind ('hypermentalizing'); attachment status; and a poor integration between conscious and automatic systems of social cognition processing. These deficits were evidenced through assessments attempting to sample conscious/controlled mentalizing using a variety of different means: self-report questionnaires and video vignettes. Studies have evaluated or recommended interventions on both in- and out-patient basis, using psychodynamic models that derive from attachment theory and that aim to target specific mentalization deficits including conscious external/other processing (e.g. face emotions). However, a number of methodological limitations were identified as shown in Table 1, which should be considered when extrapolating treatment and clinical practice guidance from results and study conclusions.

6.1.1 *Sampling*

Six studies were uncontrolled in having no appropriate comparison study groups (Sharp, Ha et al, 2013; Laurenssen, Feenstra et al, 2013; Sharp, Venta et al, 2016; Fossati, Feeney et al, 2014;; Robin et al, 2012; Jovev Chanen et al, 2011). Sample size was acknowledged to be too small in three

studies (Laurenssen, Feenstra et al, 2013; Roussouw & Fonagy, 2012; Scott et al, 2011) and in terms of group composition, three studies comprised female gender only (Laurenssen, Feenstra et al, 2013; von Ceumern-Lindenstjerna et al, 2010; Kalpakci et al, 2015). A further study (Jovev Chanen et al, 2011) highlighted a gender imbalance in their clinical group, and acknowledged their sample had an above-average level of educational attainment/ qualifications. Such individuals have been found to score more highly on assessments that require good language and academic skills (Levrez, Bourdin, Le Driant, d'Arc & Vandromme, 2012; Ronald, Viding, Happe, & Plomin, 2006). Many studies did not describe the participants in terms of ethnicity or socio-economic background (e.g. Bo et al, 2015; Roussouw, 2015) and Ha, Sharp et al (2013) comprised mainly Caucasian adolescents. One study was based on an inpatient population (Ha, Sharp et al., 2013) whereas others were not clinical samples but drawn from non-clinical populations (Fossati Feeney et al, 2011; Scott et al, 2011; Fossati, Feeney et al, 2014). Whilst these studies may be helpful in identifying BPD behaviours at the trait level, in addition to characteristics that may be helpful to target in early intervention programmes (Fossati, Feeney et al, 2011; Fossati, Feeney et al, 2014), they may lack generalizability to studies of adolescents with developed clinical syndromes.

While many studies lacked comparison groups, they have effectively demonstrated early evidence (through pre-post study designs) for the efficacy of treatment regimes that are focusing on the problematic social cognitive functioning that is central to BPD.

Study Group and Measurement Effects

Three studies used self-report only to identify participants for the clinical (BPD) group (Sharp, Pane et al, 2011; Fossati, Feeney et al, 2011; Fossati, Feeney et al, 2014) and a further study (Berenschot et al, 2014) did not use standardized diagnostic instruments. Roussouw & Fonagy (2012) used an unpublished measure of mentalizing, and whilst comparing MBT-A with TAU the alternative (ie TAU) intervention was not manualised. One study (Jovev, Chanen et al, 2011) failed to screen participants for a history of child abuse and neglect (CAN) and a number of other studies (Ha, Sharp et al, 2013; Sharp, Ha et al, 2013; Sharp, Pane et al, 2011) did not report data on prior experiences of CAN; these omissions are important as CAN is viewed as a significant potential precipitating factor in BPD (Fossati, Madeddu, and Maffei, 1999). A number of studies are based on experimental tasks that may not resemble the processing and social-cognitive demands of real life/day-to-day experiences (Berenschot et al., 2014; Jovev et al., 2011;) and, in considering the test performance of all adolescents (both with and without diagnoses of clinical syndromes) Fossati et al. (2014) identified high variability of the CET performance in their “high BPD” group. There were a number of studies that were of good quality given the constraints of working and researching a known complex and hard-to-treat clinical group and that reported on treatments and assessment methods that are novel and show promise in assisting clinicians in early identification and in ongoing review of clinical episodes.

Statistical Properties

The internal consistency of questionnaires was low in the study by Fossati, Feeney et al, 2011 and Ha, Sharp et al, 2013 reported that the RFQY internal factor structure had not been examined. Inter-rater reliability data is missing in two studies(Jennings, Hulbert & Jackson, 2012; Laurenssen, Feenstra et al, 2013). Two studies were underpowered (Sharp, Ha et al, 2013; Scott et al, 2011) and Bo et al (2015) was a discursive document that presented no study design.

7. Conclusions

The present literature review found that mentalizing difficulties contribute to the behaviours characteristic of BPD in both external/other (conscious) mentalizing function as well as automatic (subconscious) mentalizing. Adolescents with BPD are more sensitive to facial emotions of others and at lower levels of sensitivity and initial orientation, notably for negative emotions. This sensitivity is potentially associated with prior experiences of child maltreatment and a there is a consensus between studies that this sensitivity (to prior maltreatment) is associated with behavioural markers of the borderline personality disorder.

On the basis of the papers reviewed, that are predominantly of a good quality according to Kmet criteria, the four-construct model of mentalization outlined earlier in this paper (Choi-Kain & Gunderson, 2008) is a useful and inclusive framework to view mentalizing problems in adolescent BPD, and is enhanced further by including the interpretation of the 'dual process' model of social cognition (Chaiken & Trope, 1999) by Fonagy & Luyten (2009) that accounts for the rapid processing of external mentalizing stimuli that leads to dysregulated internal emotional states.

Mentalizing is also involved in an accelerated disconnect between individuals' processing of the external/other conscious processing (e.g. emotions in the face) and implicit/automatic mentalizing, in terms of promoting increased emotional arousal. Attachment security appears to be a mediating factor. The review found a consensus that excessive theory of mind or hypermentalizing is a social cognitive marker for adolescents with BPD, and a

relationship between hypermentalizing and low reflective functioning and emotion dysregulation. Mentalization function has thus far in the literature been assessed via experimental tasks and self-report questionnaires.

Treatments that target mentalization dysfunction have been studied on both inpatients and outpatients, predominantly via psychodynamically-oriented models, and promising, yet limited, positive changes have been reported. There are also recommendations for specific skills-training components to target explicit/other conscious aspects of impaired mentalization functioning.

Implications for Clinical Practice

This review has highlighted a number of caveats and potential benefits for clinical practice, both for clinicians and for service users. Given that the acceptance of BPD psychopathology in adolescents still holds some controversy amongst clinicians (Griffiths, 2011) a consensus has emerged for BPD to be a reliable and valid diagnosis in adolescence (Chanen & McCutcheon, 2008; Sharp and Romero, 2007). With this context in mind, clinicians must aim for contextually-valid and wide-ranging assessments that sample fundamental traits of the disorder. Time and financial constraints can often limit the use of multiple assessment measures in clinical settings (Ha et al., 2013) and so instruments such as the Reflective Functioning Questionnaire for Adolescents (RFQY; Ha et al., 2013) shows promise as a highly relevant assessment tool although presently only tested with an inpatient population.

In terms of breadth of assessment, this review recommends there are implications for clinicians to assess different dimensions of mentalization,

including conscious, external mentalizing (e.g. Scott et al., 2011, von Ceumern-Lindenstjerna et al., 2010), attachment (Fossati et al., 2014), and excessive theory of mind or hypermentalizing (Sharp et al., 2011). Scott et al. (2011) advocated that the demands of real-life, everyday social cognition is important and in this respect the MASC (Dziobek, 2006) seems an instrument showing promise.

For clinical interventions, hypermentalizing has been identified as a valid treatment target for BPD populations (Sharp et al., 2016) with a key goal for clinicians to be averting the total disintegration of the young person's social cognitive system (Bo et al., 2015). Bo et al. (2015) also emphasise the central role of the therapist-client relationship as a collaborative enterprise in forging epistemic trust with a young person; a critical implication here is in accepting the likely longer-term nature of MBT-A and similar interventions such as Dialectical Behaviour Therapy (Linehan, 1993), with 12-months duration of an intensive programme of group and individual therapy components being quoted in the Roussouw & Fonagy (2012) study. There is no literature at this point to have reported on intensive interventions with adolescents in the community perhaps leaving vulnerable adolescents with access to short-term models of input that are unlikely to address the core deficits and impairments of the disorder, often showing little or no improvement with multiple standard community treatments (James, Taylor, Winmill and Alfoadari, 2008).

For service users, a number of studies in this review imply the benefits of early interventions for this population (Fossati et al., 2014; Fossati et al., 2011; Scott et al., 2011;) although there are a number of problems in this area

in terms of identifying potential candidates for inclusion into early-intervention programmes, in particular identifying specific risk factors that are specific to BPD, as opposed to psychopathology in general (Sharp & Fonagy, 2015).

Further, strengthening the adolescent's capacities to mentalize, especially under conditions of stress, promotes an improved sense of interpersonal agency and sense of self, promoting in turn improved emotional and behavioural regulation and improved impulse control (Fonagy, 1998; Roussouw, 2015). Interventions that aim to improve mentalizing skills seems likely to help the individual to form a clearer understanding of interpersonal contributions to relationships including the behaviour of others, that promotes self-compassion and empathy (Bleiberg et al., 2012; Roussouw, 2015;). Essentially, when the individual increases their mentalizing capacity, they improve in their ability to be curious about their own minds as well as about the minds of others (Roussouw, 2015).

Recommendations for Further Research

Despite recent interest in the role of mentalizing to BPD in adolescents, this field is at an early stage of development. While studies included in this review report the relevance of an individual's background and in particular early close relationships with caregivers, the role of trauma has not been investigated. Given the propensity for early experiential trauma (i.e., developmental trauma; Van der Kolk, 2005) to alter neurology (Glaser, 2000) future research should explore the neural correlates of mentalizing dysfunction. Developmental neuropsychology has investigated the specific changes in brain structure and function during adolescence (Blakemore & Choudhury, 2006) and to extend this work into clinical domains such as the

onset of BPD and other personality problems should help in determining specific vulnerabilities.

The majority of included studies were cross-sectional in design, therefore a prospective longitudinal study design would be useful to investigate the progression of the behaviours and social cognitive impairments characteristic of the disorder across adolescence and beyond. Studies advocated the desirability of early interventions, yet there is no research to date into this area. This may be as a consequence of the problems in identifying vulnerable populations in this age group as previously highlighted, along with continuing controversy and reluctance to diagnose BPD in minors (Sharp & Bleiberg, 2007).

The hypermentalizing model of BPD (Sharp, 2014) is a promising paradigm for conceptualizing the mentalizing problems inherent to the disorder and the MASC (Dziobek, 2006) appears a valid instrument for examining mentalizing. There are no studies examining adolescents' performance on the MASC in non-clinical populations and this is a clear need especially as social cognitive functioning in adolescence is marked by significant change and often turbulence (Blakemore, 2008; Choudhury & Blakemore, 2006). The studies that offered the richest clinical accounts of BPD in adolescence (Bo et al., 2015; Roussouw, 2015) while reporting on an established clinical intervention (MBT-A) did not report measures of mentalizing function and this would be useful in future clinical reports published in the literature, to examine in a structured way for sensitivity to change across time-points in this therapy. While there is one published randomized controlled trial included in this review (Roussouw & Fonagy,

2012) this was directed towards MBT-A with adolescents who self-harmed and compared with TAU. Future RCT's would therefore be useful to compare a broader range of treatment approaches, and that include pharmacology, social skills programs, milieu-focused therapy, the hypermentalization model as well as treatment as usual.

Glossary of Terms

Affective empathy	the subjective state resulting from emotional contagion. automatic drive to respond appropriately to another's emotions.borderline personality disorder
Cognitive empathy	the largely conscious drive to recognize accurately a understand another's emotional state. Used intercha "perspective-taking".
Emotional dysregulation	an emotional response that is poorly modulated, an within the conventionally accepted range of emotive
Hypermentalization	social-cognitive processing when an individual attrib intentions, ideas, wishes and beliefs to other people absence of objective evidence to support such belie attributions.
Impulsive instability	a tendency to act on a whim, displaying behavior ch by little or no forethought, reflection, or consideratio consequences.
Mentalization	the capacity to understand actions in terms of thoug feelings
Milieu therapy	a form of psychotherapy that involves the use of the communities
Theory of mind	the ability to attribute mental states—beliefs, intents pretending, knowledge, etc.—to oneself and others understand that others have beliefs, desires, intenti perspectives that are different from one's own.

Affect consciousness	an individual's ability to consciously perceive, tolerate, reflect upon, and express affects
Mindfulness	the psychological process of bringing one's attention to the internal and external experiences occurring in the present moment
Negative social judgment bias	the notion that, even when of equal intensity, things of a more negative nature (e.g. unpleasant thoughts, emotions, or social interactions; harmful/traumatic events) have a greater effect on one's psychological state and processes than do neutral or positive things.
Psychological mindedness	a person's capacity for self-examination, self-reflection, introspection and personal insight.

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CHAPTER TWO – EMPIRICAL PAPER.

THE ROLE OF THEORY OF MIND IN THE EMOTIONAL, BEHAVIOURAL AND COMMUNICATIVE FUNCTIONING OF ADOPTED ADOLESCENTS

BY:

ALASTAIR BARNETT

The Role of Theory of Mind in the Emotional, Behavioural and Communicative Functioning of Adopted Adolescents

Abstract

Studies investigating the development of Theory of Mind (ToM), mentalizing and the development of social cognitive abilities report that the pre-school years are critical for the development of a functioning ToM, adaptive behaviour and a number of social and developmental skills that promote healthy psychological and social functioning. Impairment and inaccuracies or distortions of these skills are risk factors for individuals with developmental problems, and those who have experienced childhood adversity such as child abuse and neglect. Further, early adversity is associated with later social, emotional and behavioural consequences.

This study investigates for differences between the ToM functioning of a group of adolescent adoptees and an age and gender-matched comparison group of non-adopted adolescents, using an established battery of social cognition & ToM assessments, the Skuse Assessments of Social Intelligence (SASI). Analyses were undertaken to investigate for relationships between ToM functioning and emotional & behavioural functioning using the Strengths & Difficulties Questionnaire battery (SDQ) and social and communication skills using the Children's Communication Checklist, 2nd edition (CCC2). With the adoption group, subsequent analyses were undertaken to explore for relationships between ToM and two established risk factors arising from early child maltreatment, age of removal from the birth family and the number of foster placements prior to permanent placement.

Significant results are reported between the groups for SDQ parent-ratings of emotion and behaviour functioning and prosocial behaviour, with adoptees being scored as showing more concerns than the comparison group. One significant ToM functioning difference was found using the SASI, suggesting adoptees used less mental-state language to communicate social intent. A significant difference between the groups was found on the Social Relationships sub scale of the CCC2, supporting a hypothesis that social functioning may be influenced to a minor extent by adoption status.

There were no significant effects found from the number of prior foster placements or the time of removal from birth family. This may be because of a sampling issue in the adoption group. Overall, results confirm previous research and meta-analysis suggesting that adoption per se enhances life chances for children who are born into extremely adverse circumstances.

1. Introduction

Theory of Mind (ToM), the ability to reflect upon and infer the entire range of one's own and others' mental states which motivate action and intent, has been the topic of much research examination over recent years (Baron-Cohen, 1995; Cicchetti, Rogosch, Maughan, Toth, & Bruce, 2003; Longobardi, Spataro, Rossi-Arnaud, 2016; Perner, 1991). Because ToM skills relate to mature social skills and a range of cognitive processes and abilities (Montgomery, Stoesz & McCrimmon, 2013; Perner, 1991), including social cognition and competence (Carpendale & Lewis, 2006; Cutting & Dunn,

1999), they may have important implications for a range of psychosocial outcomes (Pears & Fisher, 2005).

The foundations of ToM functioning extend from infancy, beginning with shared reference and joint attention (Bretherton, McNew & Beeghly-Smith, 1981; Tomasello, 1995) and are achieved by most typically developing children by approximately 4 years of age (Wellman, Cross & Watson, 2001). The development of language ability is regarded to be fundamental to the development of a ToM (Astington & Jenkins, 1999; de Villiers & de Villiers, 2014; Olson, 1988), as is the ability to talk about internal states of self and others, which emerges in the second year and increases during the third year and beyond (Bretherton et al., 1981). However, the toddler's development of this internal state language is closely related to the amount of parental and family discussions about feeling and emotion states (Dunn, Brown, Slomkowski, Tesla & Youngblade, 1991; Ensor, Devine, Marks & Hughes, 2014). For example, Ruffman, Slade and Crowe (2002) found that maternal use of mental state language between their child's 3rd and 4th birthday correlated with the subsequent development of a well-functioning theory of mind at 12-month follow-up, a finding similar to that of Meins, Fernyhough, Russell and Clark-Carter (1998).

A significant amount of research into ToM functioning has been undertaken with so-called atypical populations, notably children with autism spectrum disorder (ASD). Theoretical viewpoints have been postulated to support an argument that neurobiological factors both facilitate the emergence of theory of mind abilities and also precipitate a deficit in the ToM of children with ASD (e.g. Abu-Akel, 2003; Baron-Cohen, 1995, 2005; Hopcroft, 2013;

Schroeder, Desrocher, Bebko & Cappadocia, 2010). However, ToM has also been studied in other atypical groups, such as children with profound hearing impairment and those who have been maltreated (investigations amongst the latter in respect of ToM have primarily focused on preschool and infant/preschool-aged populations). Peterson and Siegel (2000), for example, found that profoundly deaf children who have access to other (signing) family members perform much better on ToM tasks than deaf children from hearing families who do not use sign language. These researchers concluded that deficits in ToM understanding may be due to a number of possible factors, certainly more than the well-established neurobiological model of innate neural damage (Siegal and Varley, 2002) that has been employed to explain the severe problems that children and adults with ASD can demonstrate on ToM tasks (Baron Cohen, Wheelwright, Hill, Raste and Plumb, 2001; Peterson & Siegel, 1999).

ToM and Maltreatment.

Pears and Fisher (2005) reported that, in a sample of 3 to 5-year-old maltreated foster children compared to a group of same-aged, low-income, non-maltreated children living with their biological families (n = 31), children placed in foster care showed significantly poorer emotion understanding and ToM capabilities. Further, Cicchetti et al. (2003) reported that, amongst children with a verbal mental age of 49 months or greater, maltreatment (i.e., sexual abuse, physical abuse, emotional abuse or neglect) was significantly related to delays in the development of ToM. In family contexts characterised by chaos, chronic stress and disorganisation (Cicchetti & Lynch, 1995, Cicchetti & Toth, 2005), there are likely to be acute difficulties for the

developing child in understanding parental states of mind, and few opportunities for joint and shared attention (Cicchetti & Toth, 2005; Rogosch, Cicchetti & Aber, 1995). Given that maltreatment promotes insecure or disorganised attachment relationships between children and their caregivers (Barnett, Ganiban & Cicchetti, 1999; Minnis, et al, 2013), and may lead to either the diminished use or absence of internal feeling state language (Beeghly & Cicchetti, 1994; Merritt & Klein, 2015), there is an increased risk for parental, contextual and individual developmental factors to promote deficits in ToM understanding in children.

There is consistent evidence that children removed from maltreating circumstances and subsequently adopted are likely to make a remarkable recovery from often extremely adverse pre-adoption circumstances. A meta-analytic study of the cognitive and academic progress of adoptees (van Ijzendoorn & Juffer, 2005) illustrated that children can benefit enormously from being adopted, especially during infancy, displaying a significant trajectory of development toward typical developmental milestones along a number of critical developmental, cognitive and psychological measures in comparison to siblings who remained “left behind” in their birth families. This account is in stark contrast to previous research suggesting adopted children inevitably show problems in relation to attachment, self-esteem and challenging behaviour – the so-called “adopted child syndrome” (Kirschner, 1992). The accounts that concluded a necessarily pessimistic outcome for children maltreated and subsequently adopted were found to be based on autobiographical and anecdotal accounts and, as such, were prone to significant bias (van den Dries, Juffer, van IJzendoorn, & Bakermans-

Kranenburg, 2009).

Meta-analysis has revealed only small differences between adoptees and non-adopted (non-maltreated) comparisons groups regarding total behaviour problems with effect sizes for internalizing and externalizing behaviour difficulties from -.16 to -.24 (Van IJzendoorn & Juffer, 2006). Of the small subgroup of children who do present with significant problems, Van Ijzendoorn and Juffer (2005) indicated that they tended to have been severely abused and neglected during infancy and early childhood, and were likely to have been adopted relatively later (12 months of age or older). In effect, a previous focus on this small group of adoptees had given a somewhat skewed impression as to the mental health and wellbeing of adopted children. Interestingly, whilst the evidence is mixed as regards the influence of age at adoption upon adopted children's cognitive abilities (O'Connor, Rutter, Beckett, Keaveney, Kreppner and the English and Romanian Adoptees Study Team, 2006; van Ijzendoorn & Juffer, 2005) it does seem to be associated with later school performance and behavioural functioning (van Ijzendoorn & Juffer, 2005). Social-cognitive functioning, including ToM, may play a part in explaining these difficulties.

For those maltreated children who continue to experience challenges following adoption, there has been speculation that these more challenging problems (relative to the majority of adoptees) could be the result of a variety of factors, including prenatal drug and alcohol abuse, child abuse and neglect, and system-related factors, such as multiple foster placements (Aarons, James, Monn, Raghavan, Wells, and Leslie, 2010; Leathers, 2006). Others have speculated that some of these children may begin to struggle with the

loss of their birth parents and that this burden of grief hampers development in a number of domains, including ToM (Brodzinsky, Schechter & Henig, 1992). Such losses (e.g. of birth parents) are hypothesised to lead to intrusive thoughts and rumination, which may limit the ability to focus on tasks at hand (Main, 1999).

A third theory attempting to account for behavioural and neurocognitive differences in adoptees is that genetically determined problems and the enduring effects of deprivation combine to influence the infant/young child's brain to such an extent that the development of crucial psychological and self-regulatory capabilities become impaired. Such impairments are thought to interfere with the normative attainment of ToM understanding, amongst other neurobiological and psychological structures (Goodman, Quas & Ogle, 2010; Pears & Fisher, 2005).

In summary, child abuse and neglect has been shown to be a significant risk factor for future challenges in childhood, adolescence and adulthood, including: disorganised attachment (Carlson, Cicchetti, Barnett & Braunwald, 1989; Kay & Green, 2013; Main & Solomon, 1990; Minnis et al., 2013); adult psychopathology (Huh,Kim, Yu and Chae, 2014; Mullen, Martin, Anderson, Romans & Herbison, 1996; Wota et al, 2014;); hyper-reactivity to stress (Doom, Cicchetti, & Rogosch, 2014; McLaughlin, Sheridan, Alves & Mendes, 2014); and adverse parenting skills as adults (Ehrensaft, Knous-Westfall, Cohen & Chen, 2015).

Recent studies, facilitated by advances in neuro-imaging technology, have been concerned with the effects of various physical and environmental influences, including maltreatment on the developing infant brain, which

increases in volume more during the first year of life than at any other time throughout the lifespan (Harper, Feldman, Sugar, Anderst, Lindberg, & Examining Siblings To Recognize Abuse Investigators, 2014; Mueller et al., 2010). During the early development of the brain there are thought to be sensitive periods when particular environmental experiences significantly affect brain maturation (Andersenet al., 2008; Glaser, 2000; Teicher et al., 2003).

Greenough and Black (1992) describe two sensitivity periods: experience-expectant and experience-dependent maturation. Experience-expectant sensitivity is described as development that does not occur unless a particular experience occurs during the critical period; such development is thought to be genetically determined (e.g., development of visual acuity; Taylor & Taylor, cited in Glaser, 2000). Experience-dependent sensitivity is a term for environmental experiences that contribute actively to the development of the brain but, unlike experience-expectant maturation, the experiences are not predetermined. Experience-dependent development helps to generate new neural connections in response to environmentally determined experiences. This development is in tandem with the overproduction of synapses throughout the brain during the first two years of life, another genetically determined process. Subsequently many synaptic connections are "pruned" if unused (Singer, 1995). Thus, neural pathways are retained and developed when environmental influences promote the use of such pathways.

In considering brain development and child maltreatment, neglect and failure of environmental stimulation during critical periods of brain growth may

lead to permanent deficits in cognitive abilities (Glaser, 2000). From a developmental-organisational perspective, socio-emotional and cognitive skills influence communicative competence and, by turns, language development influences subsequent cognitive and social emotional development (Schoon, Parsons, Rush & Law, 2010). For the maltreated child, it is possible that repeated separation from caregivers or prolonged experience to dysfunctional communicative interactions, may result in the child failing to develop adequate resources for the development of flexible social and communication skills. Coster and Cicchetti (1993) suggest that, even if subsequent environments improve, ongoing communication problems may persist without therapeutic intervention to ameliorate the effects of the early abusive experiences.

Most research in relation to the ToM functioning of maltreated children has concentrated on younger children, due in part to the existing empirical evidence that most four-year-olds can demonstrate false belief understanding (Bauminger-Zviely, 2013; Wellman, Cross & Watson, 2001). Studies have inferred that poorly functioning ToM abilities in early childhood could lead to continued social and emotional malfunctioning during middle childhood and adolescence (e.g. Cicchetti et al., 2003, Wellman, 2002). However, the relationship between early abusive experiences and aspects of communicative competence later on, particularly social perspective taking such as ToM, requires further study. Although there are negligible differences between children placed for adoption in early infancy and non-adopted children on measures of academic achievement, cognitive functioning & physical growth (van IJzendoorn & Juffer, 2005), evidence suggests that

adoption in later childhood is a significant risk factor for social, emotional and behavioural problems (Brand & Brinich, 1999; Escobar, Pereira & Santelices, 2014; Howe, 1997; GagnonOosterwaal et al., 2012).

Therefore, given the proposed links between social cognitive abilities and adoptive status (and age of removal and eventual adoptive placement), there is a need to study the ToM functioning in older children who have been adopted, particularly examining for differences in this aspect of social cognitive functioning and also exploring relationships between ToM abilities and early experience and placement variables. As the preschool years appear to be critical in the development of ToM functioning (Cicchetti et al., 2003) age at removal from the maltreating environment may prove a significant factor in understanding the potential subsequent effects on social cognitive functioning, such as theory of mind. If differences are found in ToM functioning between children removed from an abusive environment early on in infancy compared with those removed later in the preschool period, the effects of such differences on real-world functioning (e.g., emotional, behavioural and communicative functioning) should be explored.

2. Research Aims & Hypotheses

Research Aim A: To explore relationships between adoption status (adoption versus non-adoption), emotional and behavioural functioning, and Theory of Mind test performance.

Hypothesis 1: There will be a significant difference in emotional and behavioural functioning (SDQ) between adoption and non-adoption groups.

Hypothesis 2: There will be a significant difference in ToM (SASI) functioning between adoption and non-adoption groups.

Hypothesis 3: There will be significant differences in communication skills between adoption and non-adoption groups.

Research Aim B: For adopted adolescents, to explore relationships between pre-adoptive history, age of removal from birth family, and number of foster placements, with ToM test performance and emotional and behavioural (SDQ) functioning.

Hypothesis 4: There will be a significant relationship between ToM test performance and emotional and behavioural functioning with age that the child was removed from the birth family environment.

Hypothesis 5: There will be a significant relationship between the number of foster placements prior to adoption and ToM test performance and emotional and behavioural functioning.

Hypothesis 6: There will be significant relationships between pre-placement experiences of abuse and neglect and current behaviour as scored via the SDQ.

Research Aim C: For adopted adolescents, to explore the relationship between age of removal from birth family and parent-rated communication skills.

Hypothesis 7: There will be a significant relationship between age of removal from birth family and parent-ratings of communication skills.

3. Method

Participants & Recruitment

Thirty-two adolescent participants (16 boys, 16 girls) ranging in age from 11 to 16 years (mean = 13 years 7 months; SD = 2 years 3 months) comprised the adoption group for this study. 20 children in the adoption group had been removed from their birth families before 24 months of age (mean age at removal = 21 months, SD=25.41 months, range=0-99 months). The average number of foster placements prior to adoptive placements was 2, SD=1.016, range=1-5.

For the comparison group, twenty-one non-adopted adolescents, matched for age and gender (mean = 13 years 5 months; SD = 1 year 6 months), served as controls. Candidates for inclusion in the adoption group were selected on the basis of information from the corresponding adoption team to state the child had been removed from the care of his/her family during the first 48 months of life, and subsequently adopted. Age at removal from birth family was calculated using the child's age in months at the time of removal. Exclusion criteria for both adoption and control groups included a participant being placed in special education for children with moderate to severe learning disabilities, or if school records indicated that the child experiences profound hearing loss, or uses English as a second language.

Participants were recruited using a number of methods: (a) a leaflet was distributed through three local authority post-adoption support teams based in the Midlands, United Kingdom (UK) (Appendix A); (b) information was posted on the website of a prominent UK adoption charity (Appendix B); and (c) word-of-mouth from families who had already volunteered to take part

in the study. Control group participants were recruited from 2 secondary schools in Warwickshire (9 participants) and an independent school based in the West Midlands (12 participants) using an information leaflet (Appendix C). Schools were chosen on the basis of non-random, convenience sampling. Data regarding response rate was not collected as all adoptees who showed a willingness to participate and met inclusion criteria were invited into the study and participated. All adopted group participants who indicated their willingness to take part were willing and able to do so. Comparison group numbers were limited to 21 due to time constraints.

Measures

Four measures were used, including: (a) The Schedules for the Assessment of Social Intelligence (Skuse, Lawrence and Tang, 2005); (b) Animated Abstract Cartoons (Abell et al., 2000); (c) Strengths and Difficulties Questionnaire (Goodman, 2001); and (d) The Children's Communication Checklist – version 2 (Bishop, 2003). As improved theory of mind functioning has been shown to be related to verbal intelligence (Levrez, Bourdin, Le Driant, d'Arc & Vandromme, 2012; Ronald, Viding, Happe, & Plomin, 2006) a fifth measure, The Wechsler Abbreviated Scale of Intelligence (WASI), was also administered to examine, and where necessary to control for, significant differences between adoption and control groups in respect of cognitive abilities.

Demographic and Background Information Forms

Adoptive parents were invited to complete questionnaires concerning aspects of their present family composition and the adoptee child's placement

history and early experiences using a Family Information Form and a Pre-Placement History Form developed for this study (Appendix D).

Schedules for the Assessment of Social Intelligence. (SASI: Skuse at al., 2005).

The SASI is a standardized set of measures of social-cognitive competence, developed with the intention of measuring objectively the functional integrity of the 'social brain' (Skuse et al., 2005). It was chosen for this study for utility and speed of administration whilst sampling a number of domains of social cognitive ability. The assessment battery is comprised of a set of tasks administered via computerized presentation. The SASI comprises the following components, presented in the following order:

– facial expression recognition task

– gaze-monitoring task

– face recognition memory task

– Theory of Mind animation task.

The SASI is designed to be administered to children and adults, aged between 6 and 65 years. Centile scores or z scores can be generated from the standardized scores for performance, according to an individual's age and sex. The full battery of SASI tasks was used in this study. The test materials were presented to the participants using a Hewlett-Packard laptop computer (G62 model, 15.6" screen) placed before each participant at a suitable and comfortable distance and height. The researcher used written instructions to explain the test material to ensure a standard administration (Appendix E):

i. Facial Expression Recognition Task. Individuals are presented with images of different facial emotions and are required to select the

correct written word expression from a list of possible answers. A total of 60 faces are presented. There are 10 examples (male and female, balanced) for each of the following emotions: fear, anger, disgust, sadness, happiness and surprise (Skuse et al., 2005). Published test-retest data over a mean of 20 months (range 3-28 months) are acceptable (Skuse et al., 2005) for the facial recognition task. Scores range from 0-60; higher scores are indicative of greater accuracy in naming the pictured facial emotion. The SASI has been shown to possess excellent psychometric properties in terms of reliability and validity (Skuse etc al, 2005)

ii. Gaze-Monitoring Task. This task measures accuracy in the detection of gaze direction in static photographs. Thirty photographs of adult models are displayed with the eyes looking out and with eye gaze deviated between 5 and 20°. For each trial, participants were required to indicate whether the person in the photograph was looking directly into his/her eyes or looking to their left or right. Higher scores are indicative of accurate eye gaze perception.

iii. Face Recognition Memory Task. This is a computerised version of the Warrington Face Recognition Memory Test (Warrington, 1984). Two phases are included: learning and testing. In the learning phase, individuals are presented with 50 male adult faces one at a time and asked to identify whether they are ‘nice’ or ‘not nice.’ Participants are told that their judgment is not scored and that their response was to assist them in remembering the face for the second part of the test. In the testing phase, respondents were presented with faces two at a

time, side-by-side, and asked to indicate which face they had seen in the first phase of the test. This task requires encoding, face memory storage and recall over time and has been widely used in cognitive research (Skuse, Lawrence & Tang, 2005). Scores can range from 0-50; higher scores indicative of superior face recognition memory skills.

iv. Theory of Mind Animations Test (Abell et al., 2000; Castelli. Frith, Happe, & Frith, 2002). This test was used to examine theory of mind functioning. Neural networks activated in typical Theory of Mind (ToM) tasks have been shown to respond to simple animated cartoons that contain abstract symbols, such as triangles, when their movements imply (a) that they are living, and (b) that they have specific intentions towards other, such as seduction or surprise (Abell et al., 2000). This test comprises a series of computer-presented animations. Four 30 to 40-second Quicktime animated files with one practice file were shown to each participant. Each file contained one large red and one small blue triangle moving around the screen. On three of the four trials presented, an enclosure was also depicted (see Figure 1). The first animation presented was a Practice task, followed by the four ToM animations. The ToM animations showed one triangle reacting to the other triangle's mental state. In the first animation (entitled “coaxing”) one triangle attempted to persuade another triangle to leave the enclosure (illustrated in Figure 1); the second animation sequence (entitled “mocking”) showed the small triangle copying the movements of the bigger triangle in a mocking fashion; the third animation (“seduction”) depicted the big triangle coaxing the little one out of an

enclosure; and the fourth animation (“surprising”), involved the little triangle hiding behind a door and surprising the big triangle. This task has shown differences in Theory of Mind abilities between child samples with and without ASD (Campbell et al., 2006); traumatic brain injury (Levin et al., 2011); and boys with psychopathic tendencies (Jones, Happe, Gilbert, Burnett & Viding, 2010).

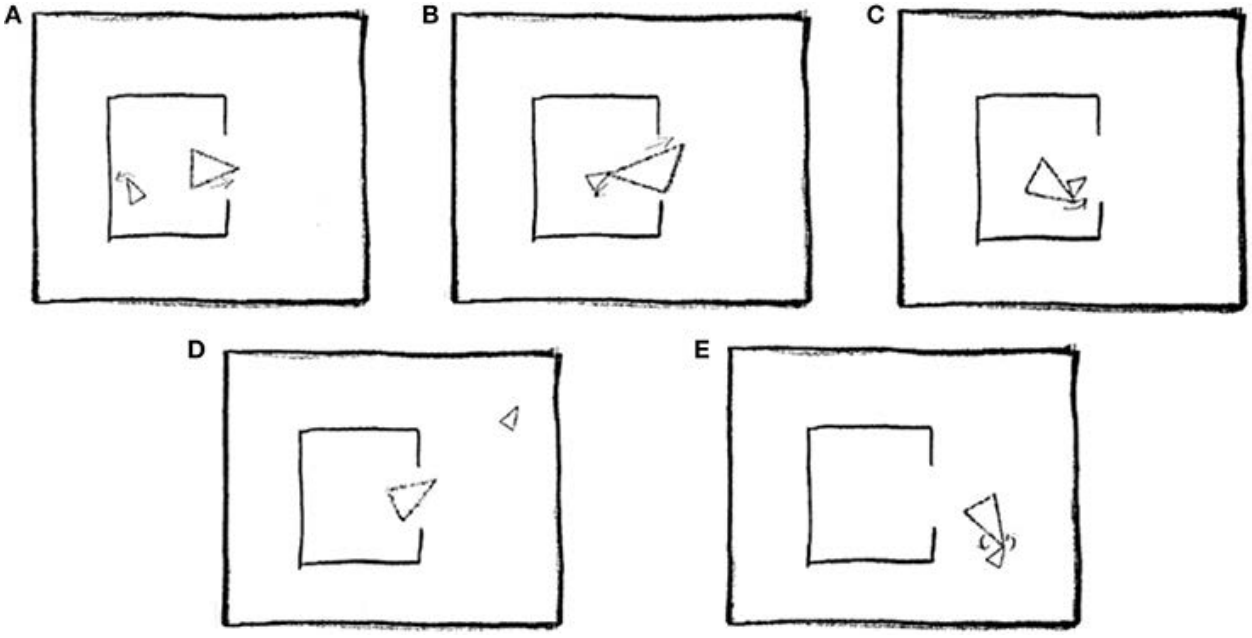

Figure 1: Scenes from Coaxing animation (from Abell, Happe & Frith, 2000)

All scoring of the SASI is automatic and datasets were uploaded to a website at the Institute for Child Health in London, UK. Results were then downloaded for subsequent data analysis. In accordance with the developers of the SASI (Skuse et al., 2005) the sequence of task administration was not fixed.

Theory of Mind Animation Materials scoring follows Castelli, Happe, Frith & Frith (2000) and their scoring guidance (p.323) is reproduced below.

The profile comprised three scores derived from the Castelli et al. (2000) paper. The first score is given to describe the *length* of the description given by the participant (0=no response; 1= 1clause; 2=2clauses; 3=3 clauses; 4= > 3 clauses). The second score defines the *appropriateness* of the description (0 = no answer, “I don’t know”; 1 = inappropriate answer: reference to the wrong type of interaction between triangles; 2 = partially correct answer: reference to correct type of interaction but confused overall description; 3 = appropriate, clear answer). The third score was in respect of *Intentionality* (0 =action, non-deliberate (e.g., “Bouncing,” “Moving around,” “Rotating”); 1 = deliberate action with no other (e.g., “Ice-skating”); 2= deliberate action with another (e.g., “Blue and red are fighting,” “Parent is followed by child”); 3= deliberate action in response to other’s action (e.g., “Big is chasing little,” “Red is allowing the Blue to get close to him,” “Big is guarding little who was trying to escape”); 4 = deliberate action in response to other’s mental state (e.g., “The little one is mocking the big one,” “Two people are arguing,” “A parent is encouraging a child to go outside”); and 5 = deliberate action with goal of affecting other’s mental state (e.g., “The blue triangle wanted to surprise the red one,” “Child pretending not to be doing anything”).

The Abstract Animations requires recording of respondents’ spontaneous comments following each presentation of an animated cartoon; recordings were made via a digital recording device. These comments were subsequently transcribed and rated by the researcher and a graduate psychology assistant who was given training for the task. Evaluations were examined for concordance across a randomly-selected sample of 10 participants from each of the adoptee and control groups (a total of 120

observations) and the number of concordant observations fell at 70% agreement (84 observations). This level of concordance is similar to the inter-rater concordance and discrepancy scores obtained in the original study by Castelli et al. (2000). Table 3 shows the average inter-rater discrepancy for the remaining 30% of observations that were not concordant.

Table 3: Average inter-rater discrepancy across the sample

Magnitude of discrepancy	Frequency	% of discrepancies
1	29	80.56%
2	6	16.60%
3	1	2.70%
Average discrepancy		1.22

Strengths & Difficulties Questionnaire (SDQ; Goodman, 2001)

This is an internationally validated 25-item checklist screening for a wide range of behavioural and emotional problems, as well as strengths and competencies, in children 2 to 17-years of age. The SDQ is available in three forms and the impact supplement version was used: teacher-, self- and parent-completed versions. A designated individual at each participant's school was invited to complete the Teacher's version; participants completed the Self-Report version (suitable for children 11 years and older), and the adoptive parent(s) completed the Parent's version.

The questionnaire items are divided equally across five subscales: emotional difficulties, conduct difficulties, hyperactivity-inattention, peer problems, and prosocial behaviour. A total difficulties score is computed, and similar to the four problem subscales (excluding prosocial), higher scores are indicative of potential emotional and/or behavioural difficulties. The prosocial scale (strengths) indicates prosocial characteristics, with low scores indicative of problematic functioning in this domain. Published reliability is reported as

satisfactory whether judged by internal consistency (mean Cronbach's alpha 0.73), cross-informant comparison (mean: 0.34), and retest stability after 4-6 months (mean 0.62).

Children's Communication Checklist version 2 (CCC; Bishop, 2003).

The CCC is a 70-item parent- (or teacher-) completed checklist, grouped into 10 sub-scales and is designed to assess structural language (e.g., syntax, speech) as well as pragmatic language abilities (e.g., use of context, stereotyped conversation) in children with possible communication impairments. Items 1-50 ask respondents to consider statements that describe behaviours concerning a child's ability to communicate, by giving a numerical answer that corresponds to the frequency of the described behaviour (range from 0-3, where 0 = less than once per week and 3= several times a day or always). Items 1-50 are concerned with communication difficulties and items 51-70 are concerned with communication strengths. Scores from the CCC generate a communications profile, and the profile produces two summary scores: (a) General Communication Composite that compares the child's scores with age-peers in terms of communication skills; and (b) Social Interaction Deviance Index, that highlights profiles indicative of Autism Spectrum Disorder or Specific Language Impairment.

Wechsler Abbreviated Scale of Intelligence (WASI; Psychological Corporation, 1999).

The WASI is a short assessment of verbal ability, non-verbal abilities and offers a general estimate of overall cognitive functioning and is suitable for use with individuals 6-90 years of age. WASI scores for general intellectual functioning were used to control for any significant differences in intellectual

functioning between the adoption and non-adoption control groups. WASI has been shown to have good psychometric properties (e.g., average internal reliability coefficient on the 4-test full-scale IQ = 0.98; test-retest reliability r=0.92).

4. Procedure

Ethical approval was obtained from the University of Birmingham Human Research Ethics Committee (Appendix F). Prospective participants in both adopted and non-adopted groups were given written information about the aims of the research and the involvement asked of participants (Appendix A). All caregivers gave informed consent and young people gave assent for their participation.

Participants were assessed by the researcher at their home. The test battery was administered by a qualified and experienced clinical psychologist; the assessment sessions lasted approximately 75 minutes each. The test battery comprised the SASI followed by the Animated Abstract cartoons, and the WASI. Administration was counterbalanced at random, whereby half of the participants were initially administered the WASI followed by the remainder of the test materials, and the other half followed the opposite protocol. This randomisation was to control for any administration order effects.

Data Analysis

Prior to data analysis, inference assumptions were checked and data were deemed suitable for parametric analysis (see Appendix G). For the majority of analysis, the conservative significance level of $p<0.01$ was used in order to control for Type 1 error due to multiple comparisons.

5. Results

Intellectual Functioning between Adoption and Non-Adoption Groups.

Given the published findings that social cognitive performance is positively linked to verbal intelligence (Levrez, Bourdin, Le Driant, d'Arc & Vandromme, 2012; Ronald, Viding, Happe, & Plomin, 2006) the adoption and non-adoption control groups were compared in respect of performance on their WASI scores (Table 4).

Table 4. Comparison of adopted and non-adopted groups in respect of WASI scores.

Group		WASI Vocabulary	WASI Block Design	WASI Similarities	WASI Matrix Reasoning	Verbal IQ	Performance IQ	Full-Scale IQ
Non-Adopted (n=21)	Mean	61.14	57.48	59.48	54.57	117.29	109.52	115.19
	Std. Deviation	7.220	7.620	7.527	4.479	12.662	8.524	10.127
Adopted (n=32)	Mean	52.59	50.88	52.06	47.88	104.13	99.13	101.94
	Std. Deviation	10.137	9.401	9.942	11.259	14.981	13.840	13.779
	F	11.177	7.224	8.468	6.696	11.020	9.461	14.310
	Sig.	.002	.010	.005	.013	.002	.003	.000

Note: WASI Verbal, Performance and Full-Scale IQ index scores have a mean of 100 with a Standard Deviation of 15.

Significant differences across all indices of intellectual performance assessed by the WASI were found between the adoption and control groups. However, the non-adopted group showed elevated IQs in comparison to what would be expected in a randomly selected sample. In contrast, the adoption group scored in the ranges consistent with normative expectations. Higher WASI scores for the control group might be a result of non-random recruitment from an independent school and two mainstream state schools in a geographic location with a predominantly higher socio-economic population. Given the significant differences between the groups, the relationships

between verbal and performance indices of intellectual functioning and participant performance on the automated subtests of the SASI were examined (Table 5).

Table 5: Correlations between Verbal IQ, Performance IQ and SASI scores.

	Verbal IQ		Performance IQ	
	Pearson Correlation	Sig. (2-tailed)	Pearson Correlation	Sig. (2-tailed)
Warrington Recognition Memory Of Faces (score)	.28	.12	.16	.27
Eye gaze test (score)	.07	.64	.24	.08

No significant correlations between the two automated SASI performance tests used for comparison and either verbal or performance IQs were found; the absence of an association between IQ and SASI performance is in contrast to previous research (Tang et al., 2005). The absence of any significant relationship between SASI performance and IQ meant that neither verbal nor performance IQs needed to be included as covariates in subsequent analyses.

Whilst there was no demonstrated relationship in this study between overall cognitive assessment performance (WASI) and social cognitive abilities (SASI), significant differences between the groups were found in respect of verbal ability, which has been shown to be related to ToM development. Given this specific finding, analysis was undertaken to sample for associations between cognitive abilities (for completeness, both performance and verbal abilities were examined) and a component of ToM, facial expression, using the facial expression recognition task amongst the adopted group only (Table 6). Given the exploratory nature of this analysis,

together with the small sample size being considered, it was decided that a $p<0.05$ be utilised for consideration of significance so as not to be too conservative with the associated risk of rejecting potentially interesting and important findings.

Table 6: Correlation between Facial Expression Recognition Task & WASI Verbal & Performance IQs for Adopted Group

		VerbIQ	PERFIQ
Happy	Pearson Correlation	0.156	0.048
	Sig. (2-tailed)	0.264	0.733
Surprise	Pearson Correlation	0.106	0.459
	Sig. (2-tailed)	0.45	0.001
Fear	Pearson Correlation	0.313	0.165
	Sig. (2-tailed)	0.023	0.238
Sadness	Pearson Correlation	0.144	0.074
	Sig. (2-tailed)	0.303	0.598
Disgust	Pearson Correlation	0.264	0.322
	Sig. (2-tailed)	0.056	0.019
Anger	Pearson Correlation	0.303	0.33
	Sig. (2-tailed)	0.028	0.016

Given the statistically significant correlations between Verbal and Performance IQs and the scores on some emotion recognition subscales (i.e., fear, surprise, disgust and anger), an Analysis of Covariance was applied to the data to control for the significant difference between the groups in terms of cognitive assessment performance. Given the correlations shown above, Verbal IQ and Performance IQ were used as covariates in the analysis of these data.

A mixed between and within subject ANCOVA was applied to the scores for the six facial emotions used in the Facial Expression Recognition Task (Table 7). The between subjects factor was Adoption status, the within subjects factor was Emotion Type (Happy Vs Surprise vs Fear vs Sadness vs Disgust vs Anger), and the covariates were Verbal IQ and Performance IQ. As

Mauchly's Test of Sphericity was not significant (W=0.756; X^2=13.16; df=14; p= 0.51) no correction for the correlation of the levels of the within subject factor (i.e., Emotion type) was applied to the observed significance values (Table 5).

Table 7: Between & Within Subjects ANCOVA

	Pillai's Trace	Wilks' Lambda	F	Sig.
Multivariate Effects				
Emotion	0.071	0.929	0.687	0.636
Emotion * Group	0.028	0.972	0.264	0.931
Univariate Effects				
Happy			0.030	0.864
Surprise			0.008	0.931
Fear			0.099	0.755
Sadness			0.030	0.864
Disgust			0.097	0.756
Anger			0.983	0.326
Covariates				
Emotion x Verbal IQ	0.105	0.895	1.059	0.395
Emotion x Performance IQ	0.231	0.769	2.699	0.032

The results from Table 5 show that there was no significant interaction effect for emotion x group. Accordingly, adopted and non-adopted adolescents did not show differing patterns of recognition of the six emotion types presented in the Warrington Face Emotion Recognition Task.

Research Aim A.

Behavioural / emotional functioning (SDQ) and social-cognitive functioning (SASI and Animated Triangles Tasks) between adoption and non-adoption groups (hypotheses 1 and 2).

To examine hypothesis 1, that there will be a significant difference in emotional and behavioural functioning between adoption and non-adoption

groups, Table 8 shows the results of SDQ comparisons between groups. In this analysis, all subscales showed significant differences between the scores given by adopted parents and the parents of non-adopted controls. The significant differences were unidirectional, in that parents of adoptees rated the behaviour of their children as being more problematic across the areas of: conduct, inattention/hyperactivity, emotional functioning, pro-social behaviour and peer relationships. In the adopted group, the average parent rating for two of the clinical problem sub-scales (conduct problems & peer problems), and the score for 'total difficulties', fell into the "borderline" range for clinical symptoms, indicative of potentially problematic levels of functioning across these domains. In terms of self-report SDQ scores, only one scale, the inattention/hyperactivity scale, showed a trend towards significance (p=0.02; adoption>control). However, the adopted group's self-report mean score for inattention/hyperactivity did not fall within the clinical range, so whilst elevated relative to their peer control group the overall level of functioning in terms of inattention and hyperactivity was not of clinical significance.

Table 8: SDQ Comparisons between Adopted and Non-Adopted Groups: Parent and Self-Report

	Adopted Adolescents (n=32)		Non-adopted Adolescents (n=21)			
	Mean	**SD**	**Mean**	**SD**	**F**	**p**
Emotion	**3.063**	**2.675**	**1.000**	**1.414**	**10.504**	**0.002**
Conduct	**3.281**	**3.353**	**0.619**	**0.669**	**12.822**	**0.001**
Attention/activity	**5.125**	**3.139**	**1.667**	**1.461**	**22.213**	**<0.000**
Peer Problems	**3.125**	**2.311**	**0.905**	**0.995**	**17.201**	**<0.000**
Pro-social	**3.1250**	**2.310**	**0.9048**	**0.99523**	**17.201**	**<0.000**
Total stress index	**14.594**	**8.882**	**4.191**	**2.522**	**27.200**	**<0.000**
Self-Rated SDQ						
Emotion	**3.031**	**2.633**	**2.667**	**2.266**	**0.271**	**0.605**
Conduct	**2.688**	**2.070**	**1.667**	**1.826**	**3.377**	**0.072**
Attention/activity	**4.844**	**2.477**	**3.286**	**2.283**	**5.330**	**0.025**

Adopted Adolescents (n=32)			Non-adopted Adolescents (n=21)			
Peer problems	**1.7500**	**1.545**	**1.5238**	**1.36452**	**0.297**	**0.588**
Pro-social	**1.750**	**1.545**	**1.524**	**1.365**	**0.297**	**0.588**
Total stress index	**12.313**	**6.940**	**9.143**	**5.507**	**3.094**	**0.085**

Each subscale of the SDQ comprises five items with each item scored by participants as 0 ("Not true"), 1 ("Somewhat true") and 2 ("Certainly true") in respect to functioning over the last 6 months. The mean score is given as the average of the five responses on the subscale concerned. The Total Stress Score mean is given as an average of all items that comprise the SDQ.

To examine hypothesis 2, that there will be a significant difference in ToM test performance between adoption and non-adoption groups, Table 9 shows the results of SASI comparisons between groups. The results show no significant differences on any of the computerised indices of social cognition. There was however a trend towards significance for recognition of facial expressions between the groups that depicted anger (p=0.03; adoption>control), which would support suggestions elsewhere that infants and children exposed to anger and negative emotions develop a heightened sensitivity to these emotions (Camras et al., 1988; Cicchetti & Curtis, 2005). There was one significant difference between the study groups in respect of the ascribed intent of the seduction item in the Theory of Mind animations task. This 'seduction: intent' finding lends tentative support to previous research that suggests children who have experienced early removal from birth families present with impaired detection of subtle emotion states and intentionality (e.g. Barahal, Waterman and Martin, 1981, Ribordy, 2014).

Table 9: SASI comparisons between Adopted and Non-Adopted Adolescents

	Adopted participants n=32		Non-adopted participants n=21			
	Mean	SD	Mean	SD	F	p
Gaze monitoring task	3437.056	1055.650	3316.129	807.735	0.199	0.658
Happy	-0.308	0.896	-0.244	0.838	0.069	0.793
Surprise	-0.168	1.098	0.098	0.752	0.939	0.337
Fear	-0.429	1.202	-0.228	0.714	0.474	0.494

	Adopted participants n=32			Non-adopted participants n=21		
Sad	-0.397	0.886	-0.325	0.943	0.080	0.778
Disgust	-0.431	1.030	-0.023	1.024	2.002	0.163
Anger	-0.656	0.977	-0.112	0.790	4.543	0.038
Face recognition memory task	3262.609	840.367	3406.702	782.461	0.393	0.533
Coaxing: Length	**2.750**	**1.295**	**3.095**	**1.261**	**0.920**	**0.342**
Coaxing: Appropriateness	2.000	0.984	1.952	1.024	0.029	0.866
Coaxing: Intent	3.250	1.295	3.238	1.513	0.001	0.976
Mocking: Length	3.000	1.218	2.905	1.136	0.082	0.776
Mocking: Appropriateness	2.469	0.761	2.714	0.644	1.485	0.229
Mocking: Intent	3.906	1.088	4.286	1.007	1.633	0.207
Seduction: Length	3.219	1.211	3.238	0.889	0.004	0.950
Seduction: Appropriateness	2.406	0.837	2.286	0.784	0.276	0.601
Seduction: Intent	3.594	1.292	4.476	1.030	6.902	0.011
Surprise: Length	3.594	0.875	3.524	0.873	0.081	0.777
Surprise: Appropriateness	2.219	0.906	2.381	0.921	0.401	0.529
Surprise: Intent	3.875	1.408	4.286	1.007	1.334	0.254

Gaze Monitoring mean score is an average of the response times for an answer to be given; Emotion Recognition mean score are an average response time for each emotion category; Face Recognition Memory Task mean score represents the average response time (in milliseconds) across the set.

Theory of Mind mean scores represent the average score given by two raters according to the scoring criteria described in Castelli et al. (2000) described earlier in this paper.

A final analysis between the adoption and non-adoption groups was to explore differences in overall communication skills (hypothesis 3), using the Children's Communication Checklist (Table 10).

Table 10: Children's Communication Checklist: Differences between adopted and non-adopted adolescents.

		N	Mean	Std. Deviation	Std. Error Mean	t-test for Equality of Means		
						t	df	Sig. (2-tailed)
Speech	Non-adopted	21	5.8095	.51177	.11168	.409	36.783	.685
	Adopted	32	5.6563	2.02579	.35811			
Syntax	Non-adopted	21	5.7619	.53896	.11761	2.189	40.826	.034
	Adopted	32	5.0938	1.59352	.28170			
Semantics	Non-adopted	21	5.5238	1.03049	.22487	.607	51	.547

		N	Mean	Std. Deviation	Std. Error Mean	t-test for Equality of Means		
						t	df	Sig. (2-tailed)
	Adopted	32	5.1563	2.64098	.46686			
	Non-adopted	21	5.4762	1.28915	.28132	-1.158	51	.252
Coherence	Adopted	32	6.1875	2.60814	.46106			
Inappropriate Initiation	Non-adopted	21	6.0476	1.16087	.25332	-.309	44.686	.759
	Adopted	32	6.2188	2.79093	.49337			
Stereotyped Language	Non-adopted	21	6.2857	.64365	.14046	1.016	44.326	.315
	Adopted	32	5.9688	1.57571	.27855			
Use of Context	Non-adopted	21	6.1905	.40237	.08781	-.556	35.535	.581
	Adopted	32	6.3750	1.80947	.31987			
Non-Verbal Communication	Non-adopted	21	6.2857	.64365	.14046	-1.675	36.990	.102
	Adopted	32	7.0625	2.50081	.44208			
Social Relationships	Non-adopted	21	5.8095	1.03049	.22487	-2.746	45.380	.009
	Adopted	32	7.1250	2.39287	.42300			
Special Interests	Non-adopted	21	6.4762	1.16701	.25466	2.162	49.849	.035
	Adopted	32	5.5000	2.10988	.37298			

A significant difference was found between the group means in respect of Social Relationships (p=0.009). The statistically significant difference concerns Social Relationships where the parents of children in the non-adopted group rated their children as more skilled in social interaction than did the parents of adolescents in the adoption group.

Research Aim B**.**

Age at Removal and Current Functioning

To explore hypothesis 4 that there will be a significant relationship between ToM test performance and emotional and behavioural functioning with age that the child was removed from the birth family environment, the relationships between age at removal from birth family and presenting emotional/ behavioural difficulties and social cognitive abilities were examined using Pearson's product moment correlation coefficients. Although the results were non-significant, the profile of negative correlations between age at

removal from birth family and SDQ scores is of potential interest (Table 11). The pattern of results consistently showed a trend for later-placed children being rated (by both parents and adolescents themselves) as displaying reduced levels of emotional and behavioural difficulties. This finding is in contrast to research that has identified a positive relationship between older age at placement and subsequent emotional and behavioural problems (e.g. Joseph, O'Connor, Briskman, Maughan, 2014; Rushton, Mayes, Dance and Quinton, 2003; Verhulst, Althaus, and Versluis-Den Bieman, 1992).

Table 11: Age at removal and presenting behavioural difficulties

	r	p
Parent-rated SDQ		
Emotion	-0.38	0.03
Conduct	-0.14	0.45
Attention/hyperactivity	-0.13	0.48
Peer Problems	-0.15	0.46
Prosocial behaviour	-0.02	0.92
Total stress index	-0.22	0.23
Self-rated SDQ		
Emotion	-0.04	0.82
Conduct	-0.29	0.11
Attention/hyperactivity	-0.31	0.08
Peer Problems	-0.30	0.09
Prosocial behaviour	0.11	0.55
Total stress index	-0.19	0.30

No significant correlations were found between the age at time of removal from birth family and social-cognitive abilities (Table 12):

Table 12: Age at removal and social-cognitive abilities

	r	p
Eye Gaze	0.0409	0.824
Emotion Recognition Test (ER) Happy	0.0998	0.587
ER Surprise	0.0725	0.693
ER Fear	0.2583	0.153
ER Sad	0.0238	0.897
ER Disgust	0.1102	0.548
ER Anger	0.0116	0.950
Warrington Face Memory	0.2113	0.246
Coaxing: Length	0.1403	0.444
Coaxing: Appropriateness	-0.3297	0.065
Coaxing: Intent	-0.2530	0.162
Mocking: Length	0.0453	0.805

	r	p
Mocking: Appropriateness	-0.2195	0.227
Mocking: Intent	0.0673	0.714
Seduction: Length	-0.0504	0.784
Seduction: Appropriateness	0.1888	0.301
Seduction: Intent	0.2511	0.166
Surprise: Length	-0.1277	0.486
Surprise: Appropriateness	-0.2241	0.217
Surprise: Intent	-0.4039	0.022

Number of Prior Foster Placements and Current Functioning.

Given previous research has shown a relationship between the number of foster placements experienced prior to adoption and subsequent emotional and behavioural problems, these aspects were examined. However, no significant correlations were found between the number of prior foster placements and emotional/behavioural difficulties (Table 13) or social-cognitive problems (Table 14). It is interesting to note that a number of results within the SASI showed a trend to significance (ER Happy and Surprise; Face Memory accuracy), which offers tentative support to previous research in respect of multiply-placed children showing deficits in facial emotion processing (Goodman, Quas & Ogle, 2010):

Table 13: Number of prior foster placements and presenting behavioural difficulties

	r	**p**
Parent-rated SDQ		
Emotion	-0.05934	0.747
Conduct	0.16099	0.379
Attention/hyperactivity	0.02023	0.912
Peer Problems	-0.08245	0.654
Prosocial behaviour	-0.1471	0.422
Total score	-0.01666	0.929
Self-rated SDQ		
Emotion	-0.03617	0.844
Conduct	0.04601	0.803
Attention/hyperactivity	0.01282	0.944
Peer Problems	0.22605	0.213
Prosocial behaviour	-0.19792	0.278
Total score	0.1757	0.336

Table 14: Number of prior foster placements and social-cognitive abilities

	r	p
Eye Gaze	-0.227	0.197
ER Happy	-0.363	0.035
ER Surprise	-0.369	0.029
ER Fear	-0.122	0.488
ER Sad	-0.131	0.457
ER Disgust	-0.192	0.274
ER Anger	-0.238	0.171
Warrington Face Memory	-0.346	0.042
Coaxing: Length	-0.051	0.775
Coaxing: Appropriateness	0.028	0.872
Coaxing: Intent	-0.067	0.706
Mocking: Length	-0.124	0.483
Mocking: Appropriateness	0.345	0.043
Mocking: Intent	0.167	0.342
Seduction: Length	0.007	0.968
Seduction: Appropriateness	0.237	0.174
Seduction: Intent	0.157	0.374
Surprise: Length	-0.013	0.939
Surprise: Appropriateness	0.178	0.310
Surprise: Intent	0.152	0.389

Characteristics of Adoptees' Early Histories

Adoptive parents were asked to complete two questionnaires concerning aspects of their present family composition and the adoptee child's placement history and early experiences using a Family Information Form and a Pre-Placement History Form developed for this study (Table 15).

Table 15: Pre-placement experiences of adoptees

Average age of removal from birth family		**21 months (SD=25.411, r= 0-99 months)**
Age of removal from birth family		< 24 months at removal n = 20; > 24 months at removal n = 12
Average number of previous foster placements		2 (SD=1.016, r=1-5)
Average length of current (adoptive) placement		122.8 months (SD=35.81, r= 18-190 months)
Experience of Abuse/Neglect (see footnote)		
Abuse type	Mean for group (n=32)	SD
Physical Abuse	0.6	0.675
Neglect	1.733	1.015
Emotional Abuse	0.933	0.868
Sexual Abuse	0.1	0.305
Poor parental care	1.733	1.048
Malnourishment	1.067	1.014
Multiple Caregivers	0.633	0.889
Exposure to Violence	1.176	1.131
Exposure to Alcohol	1.2	0.925
Exposure to Tobacco	1.275	0.922
Exposure to Narcotics	1	1.035

Whole numbers were allocated to descriptions of severity for abuse/neglect type, where 0 = No abuse occurred; 1 = Possible; 2 = Confirmed; 4 = Extreme.

It was envisaged that an analysis would be made to investigate relationships between various pre-adoptive placement adverse experiences as reported by adoptive parents (e.g., physical abuse, sexual abuse, exposure to alcohol) and current behaviour as rated on the SDQ, however examination of the available data indicated that the number of adopted adolescents who had experienced a specified adversity were very few in number. As repeated analyses would be required, this increases the likelihood of a false positive results being reported. In consequence, it has been assumed that significant differences would be likely due to artefacts. These analyses are provided as an appendix to this study (Appendix H).

Age at Removal and Communication Skills.

To explore hypothesis 7, that for the adopted group there would be a significant relationship between age at removal from birth family and parent-

rated aspects of communications skills, Pearson's correlations were conducted (Table 16).

Table 16: Correlations between Age at Removal and Children's Communication Checklist subtest scores.

CCC Subscales		Age at Removal (months)
Speech	Pearson Correlation	.292
	Sig. (2-tailed)	.105
Syntax	Pearson Correlation	.260
	Sig. (2-tailed)	.151
Semantics	Pearson Correlation	-.088
	Sig. (2-tailed)	.633
Coherence	Pearson Correlation	.067
	Sig. (2-tailed)	.715
Inappropriate Initiation	Pearson Correlation	.023
	Sig. (2-tailed)	.901
Stereotyped Language	Pearson Correlation	.041
	Sig. (2-tailed)	.825
Use of Context	Pearson Correlation	-.139
	Sig. (2-tailed)	.447
Non--Verbal Communication	Pearson Correlation	-.072
	Sig. (2-tailed)	.697
Social Relations	Pearson Correlation	-.195
	Sig. (2-tailed)	.286

No significant correlations were found between the age at time of removal from birth family and subscales of the Children's Communication Checklist. Further, scores obtained with the CCC across both of the groups did not fall into the borderline clinical or clinical ranges as described by the developers of the checklist.

Discussion

This was the first study to explore social-cognitive abilities, including theory of mind functioning, in a group of adopted children (and matched controls) to explore relationships between social-cognitive variable, emotional / behavioural functioning, social-communication, and factors relevant to care history. This study aimed to explore (1) differences in performance on tests of social cognitive ability and Theory of Mind (ToM) between adopted and non-adopted adolescents, and further to enquire if (2) any such differences were related to current emotional and behavioural difficulties, and (3) if there were compounding effects on socio-cognitive abilities from early environmental adversity.

Adoption Status and ToM.

Social cognitive abilities, including ToM, were sampled using the Skuse Assessments of Social Intelligence (SASI) and the Abstract Animations. Overall, no significant differences were found between the study groups in respect of eye gaze accuracy, emotion recognition and face memory, except for one difference that showed a trend to significance for recognition of the emotion anger in facial stimuli - adopted participants took significantly longer to respond to a face depicting anger. Whilst there was no significant difference across the other five categories of emotions measured on this task, the suggestion in respect of adoptees processing of angry face expressions may indicate a residual sensitivity to this emotion arising from their first experiences of being parented. There is a suggestion in the literature that

children who have been maltreated present with delayed recognition skills (e.g. Camras et al., 1988; Repetti, Robles, & Reynolds, 2011) rather than being specifically deviant or deficient in their recognition of emotional facial expressions (de Rosnay, Harris & Pons, 2008). Therefore, the suggestion in this study lends tentative support to a hypothesis that early maltreatment or instability (relative to children who remain in their birth family) may exert a small influence over development in respect of facial emotional processing which, whilst not resulting in marked deviant behavioural responses, could be observed in terms of processing time of angry faces.

There was a significant difference between the groups in respect of the ToM animations seduction: intent item. This finding infers potentially a level of inappropriate mentalizing skills amongst the adoptees, similar to studies involving disruptive primary school children (Donno et al, 2010), and young offenders (Skuse,Lawrence & Tang, 2005), although should be interpreted with caution given the significant finding being a relatively isolated occurrence in the set of results using the animations.

Given that there were a number of significant differences between the adopted and non-adopted groups on measures of behaviour (parent-rated SDQ indices of conduct, inattention/hyperactivity, emotional functioning and peer relationships) and Theory of Mind test performance (attributed intent in the seduction animation) a further goal of this study was to explore if these difficulties were related to 'real-world' observations of communicative and social communicative behaviour. The results showed one significant difference between the reports given by parents of the children in the adopted and non-adoption groups on the Children's Communication Checklist (CCC2,

Social Relationships subscale). Given there was a trend toward significance (p=0.03) with the second of the Children's Communication Checklist (CCC2) subscales (special interests), further comment is warranted. These abilities are the two subscales within the CCC2 used to screen for social and communication impairment (including autism spectrum disorder) in the questionnaire's scoring profile (Bishop, 2003). Given that associations have been found amongst adopted children between early neglect and subsequent social functioning in the adoptive placement (Tan, 2006) these results are in accord with this previous research. Taken in tandem with the significant ToM functioning difference found using the SASI (Seduction: Intent item from the computerized animations subtest) the data suggests the adoptees group may be using less mental-state language to communicate social intentions, supporting a hypothesis that social functioning may be influenced to a minor extent by adoption status. These data should be interpreted with caution though, given the findings are isolated in terms of statistical significance among the data analyses between the groups.

In terms of self-ratings of behaviour (self-report SDQ), an interesting result, whilst not statistically significant using the conservative level of significance used in this study, is the higher score for attention-hyperactivity difficulties amongst the adopted group compared with their non-adopted peers (p=0.02). This may support, to an extent, other literature that has detailed the vulnerability of adopted children and adolescents to emotional and behavioural difficulties as a result of genetic risk (Beaver et al., 2012). However, the overall level of difficulty reported by the adopted group in terms

of attention and hyperactivity difficulties was ‘borderline’, i.e. not at a level of clinical significance.

Age at Removal

There was a trend to a (negative) correlation between age at removal from birth family and parent-rated SDQ scores in respect of adolescents’ ‘emotional’ functioning. However, although the overall level of emotional difficulty reported by parents was not sufficient enough for clinical significance or concern. Further, this finding is a tentative counterpoint to a range of research studies that have found late removal from adverse environments seems to exert a significantly detrimental influence on subsequent behavioural and emotional adjustment (e.g. Brand & Brinich, 1999; Howe, 1997) which may be through a tendency of adoptive parents potentially to focus more closely and with greater concern as to the behaviour of their child (Miller et al., 2000) in addition to the potential for incremental effects acting in combination. This comment must remain tentative though as the adoption group included many more young people who were placed early (mean = 21 months) potentially pointing to a bias in the group, having been self-selecting in volunteering for the study. The finding might also perhaps suggest that parents of children who are known to have been adopted later are offered greater educational support and advice in meeting their new child's emotional needs and that this has given rise to long-standing benefits. Therefore the differences between the groups may have arisen through selection and recruitment bias than evidence of potential or possible disorder.

There were no significant relationships between age at removal and scores on the subscales of the CCC. The working hypothesis was that age of removal would correlate with subsequent emotional, behavioural and social difficulties. Again the lack of significant findings in respect of age at removal and CC2 profile may be due to the majority of the group being removed relatively early in development and before the hypothesised critical period for social and ToM development (Antonietti, Liverta-Sempio & Marchetti, 2006; Astington & Baird, 2005

Number of Previous Placements

Whilst a positive correlation has been reported elsewhere between the number of foster placements a child experiences and subsequent problem behaviour (Leathers, 2006), this was not a finding of this study. This may be because of the adoption group overall was not characterised by *disordered* conduct or emotional functioning, even though the adoptive parents rated their child's behaviour more highly (indicative of potentially more problems) than the non-adopted group. Further, the average number of foster placements across the adoption group was two, and the suggestion in the literature is that the child becomes at significant risk of presenting emotional and behavioural difficulties when they have experienced three or more more foster placements than this (Leathers, 2006; Newton, 2000).

Strengths and Limitations of the Study

There are a number of strengths to this study, including the fact computerised administration eliminates manual administration errors (Skuse et al., 2005) and the study benefitted from a matched comparison group. Further, the cognitive functioning of both study groups was assessed in order

to control for significant differences in intellectual functioning between the groups. The attainments of the non-adopted group on the WASI were higher than the normative population and so were incorporated into subsequent statistical analyses. At the same time, and as highlighted earlier in this discussion, this difference between the groups might be due to sampling method - the non-adopted group were not randomly selected and more than half of the comparison group participants attended an independent school. Furthermore, for a study exploring social cognition, the matching of controls by age and gender is seen as desirable (McDonald, Fisher, Togher et al., 2015) and was achieved, but the groups were not matched by socio-economic status. Socio-economic status has been recently shown to exert an effect on adolescent language (Spencer, Clegg and Stackhouse, 2012) so future research should consider matching for this third variable in further studies.

For the adopted group, adolescents were recruited by word of mouth through newsletters and through adoption social workers. The adolescents who volunteered and subsequently agreed to participate were ostensibly functioning well (although it is not known how many adolescents refused to participate). All were placed in mainstream education or had completed compulsory education without significant disruptions (i.e. exclusions). The well-functioning status of this group was further corroborated by the parent- and self-reports from the SDQ and CCC. It is possible that an alternative sampling strategy, had it been possible within the time constraints for data collection, incorporating random selection of participants across both groups, may have been able to report the existence or not of differences between the groups with more confidence. Future methods for recruitment could involve

sampling adoptive adolescents (and their parents) via youth support services targeted to adoption and youth where difficulties have been identified (e.g., adolescents referred for intervention via the adoption support fund). Strategies of this nature risk introducing a different bias, however, such as participants who are approached via services that are targeted towards young people and families who are experiencing difficulties.

Another possibility would have been to conduct this study with a within-group design, comparing adoptees who were presenting with behavioural or emotional concerns to those who were functioning better. Previous research suggests that individuals with communication and social cognitive problems are more likely to present with emotional and behavioural difficulties (Geurts, Hilde et al., 2004) and vice versa (Gilmour, 2004), so it would be interesting to have included a 'clinical' group of youth who had experienced early adversity and subsequent adoption, as well as adoptees who were presenting with clinical levels of concern at the time of assessment.

Sensitivity of Research Tools Employed, and Suggestions for Future Research

It is possible that there *are* some differences in social cognitive abilities between the study groups but the assessment instruments used in this study, despite their use in cognitive research, were not sufficiently sensitive to detect these differences. This said, the SASI has shown sensitivity to populations with identified difficulties (e.g. young offenders (Jones, Forster & Skuse, 2005), but it is known that the battery has not previously been used to attempt to distinguish between populations on the basis of a social factor, i.e. placement status, and so the instruments might lack divergent validity in this

respect. A further possibility is that the study was underpowered in terms of participants and so any true differences between the groups would not show in a study of this size.

Further, there is a view that most Theory of Mind (ToM) tasks developed in recent years tend to show ceiling effects with older age groups (Sharp, 2006; Sharp et al., 2011) and many have been developed primarily to conduct research relating to autism spectrum disorders (Vrouva & Fonagy, 2009). It would have been interesting to have used an assessment tool sampling 'on-line' social processing such as the Movie for the Assessment of Social of Social Cognition (Dziobek, Fleck, Kalbe et al., 2006) and measures attempting to assess mental state understanding in a more contextual, 'real-life' form (Vrouva & Fonagy, 2009).

There is also a need to evaluate critically the use and validity of employing high emotional-intensity expressions in social cognition research, given the finding elsewhere that research respondents, when presented with static displays of facial emotion, show facial emotion recognition accuracy near to chance (Spencer-Smith, Innes-Ker & Townsend, 2002).

To the author's knowledge, this is the first study to investigate social cognitive abilities in adolescent adoptees. Given that social cognition is implicated in a wide range of developmental psychopathological conditions (Sharp, Fonagy & Goodyer, 2008) then this study represents a first research enquiry into this important issue. There remains continued disagreement as to the degree of risk carried by adoptees in terms of added vulnerability for mental health/psychopathology, although there does seem broad consensus

that adolescence is a particular window of risk for adopted individuals and their families (Miller, Fan, Christensen, Grotevant, & Van Dulmen (2000).

Concluding Comments.

The principal finding of this research project, that minimal differences have been found between the adopted and non-adopted groups in terms of their performance on a number of measures examining social cognitive ability, would seem to echo the conclusions of the meta-analysis concerning adoption outcome (van Ijzendoorn & Juffer, 2005). This meta-analysis concluded that children benefit enormously from being adopted, and that these benefits are seen across a host of outcomes, significantly improving the developmental trajectory and life chances of each child. Adoption still constitutes a developmental risk that tends to leave a small percentage of children presenting with significant difficulties, individuals who are likely to have been both grossly abused and neglected and to have been adopted later during childhood.

With the above in mind, perhaps it is reasonable to conclude that adoption status *per se* may be insufficient as an independent variable in psychological research around adoption. Research projects in this area would seem likely to reveal more contrasting data if they were to focus on the risk factors (medical, psychological or psychosocial) that are associated with adoption that are known to correlate with outcomes of early relational and environmental adversity.

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PUBLIC DOMAIN BRIEFING PAPER

This paper provides a summary of a literature review and research paper, supervised by Dr Gary Law, completed in fulfilment of the requirements for the Doctorate in Clinical Psychology at the University of Birmingham.

BACKGROUND

Social cognition is a term that includes a broad set of cognitive and emotional skills and processes, by which humans understand themselves and others in terms of how they think, feel, perceive, imagine, reacts, attribute, infer, etc. (Sharp, Fonagy & Goodyer, 2008). One of the processes within social cognition is mentalization, which is the capacity of an individual to understand the actions of other people using one's own thoughts and feelings. Good mentalization skills are seen as beneficial to an individual child or adult in promoting positive self-control and sensitive interpersonal behaviour. Impaired mentalization skills have been identified in a range of groups of people who display problematic behaviour, including both clinical conditions and developmental delays (for example, autism spectrum disorder, depression, anxiety, learning disability).

Adolescence is a stage of human development that encompasses a number of changes in terms of physical, cognitive, emotional, social and sexual development, as the individual develops from a child into an adult. It is also a key stage in the development of the brain, particularly for the executive

(control) functions and social cognition and, as such, the adolescent brain is considered particularly sensitive to input related to emotions, cognitions and the developing social world.

For a proportion of adolescents, problems with identity, interpersonal relationships, and coping with distressing thoughts and feelings become significantly problematic and leads to the development of entrenched patterns of behaviour including risk-taking behaviour, impulsive thinking, deliberate self-harming and frequent mood-swings. Risk of these difficulties appear to be increased if the adolescent experienced unstable relationships or abuse in infancy and early childhood. In recent years diagnosticians have considered these difficulties as characterising the onset of Borderline Personality Disorder (BPD), a significant mental health problem.

The Literature Review examines research studies that have investigated aspects of mentalization in adolescence with diagnosed BPD, or who show an emotional or thinking-style hypothesised to be characteristic of individuals with BPD. Given that early experiences are seen as playing a key role in the development of subsequent problems, the Research Paper reports on an evaluation of the mentalization functioning of a sample of adolescents who have been adopted, exploring for associations between performance on a number of mentalization assessments with current behaviour and communication skills, and also to explore for relationships between mentalization skills and aspects of each individual's prior history.

LITERATURE REVIEW

The review examines a total of 16 research and case studies, based in centres across Europe, the USA and Australia, investigating the role of mentalization in adolescent BPD. The aims of the review were to summarise research in current issues within this field, including the role of mentalization and methods of assessment and treatment that involve impaired mentalizing skills. Some researchers studied hospitalized adolescents who had been diagnosed with BPD; other studies researched adolescent populations in the community (e.g., high-school or college students) and examined the role of mentalization amongst individuals who showed attitudes and beliefs characteristic of BPD, although without formal diagnosis.

“Mentalization” can be in relation to the self or other people and either implicit or explicit behaviours (implicit mentalizing being that which takes place subconsciously and out of conscious control; explicit mentalizing is verbal and open to interpretation). The review identified three principal findings:

1. Deficits across a range of aspects of mentalizing skills and abilities are active influences in the intense difficulties with emotional regulation, interpersonal perception and feelings of insecurity in relationships that are a component to BPD;
2. Assessments must reflect the multi-faceted nature of social cognition and mentalization, ideally incorporating measurement of individuals’ external/other mentalizing in addition to implicit/automatic mentalizing. The latter is optimally measured using ‘online’, in-the-moment social processing assessments;

3. Research into mentalization-based treatments for adolescents with BPD have been carried out on inpatient (i.e. hospitalized) adolescents and have shown promise in reducing the excessive mentalizing that impacts severely on behaviour.

Conclusion. The diagnosis of BPD in adolescence remains controversial. Mentalization offers some promise in understanding some of the social cognition problems involved in the onset and maintenance of this complex and hard to treat mental health condition.

RESEARCH PAPER

The development of mentalizing abilities is considered to be influenced by a number of factors during a child's early years, especially the quality of parent-child interactions and relationship quality. Research suggests that the effects of parent-child interactions (good-enough and poor) can endure through the life-span and can be resistant to amelioration subsequently.

This paper reports on a quantitative study that explored differences in aspects of mentalization skills in a group of 32 adolescents who had been adopted, and an age and gender-matched group of 21 non-adopted adolescents aged between 11-16 years. Adolescents were presented with a computerised test battery comprising a number of tests that measure aspects of mentalization, the Skuse Assessments of Social Intelligence (SASI). The SASI comprises brief assessments that evaluate eye gaze accuracy, remember faces, recognise facial emotions (e.g. anger, sadness, disgust, happiness) and an animated task that requires participants to describe how two cartoon triangles are "interacting".

Further, the current behaviour and communication skills of the participants were compared using an established questionnaire of emotional and behavioural functioning (Strengths and Difficulties Questionnaire (SDQ), Parent- and Self-completed versions) and of speech, language and social functioning (Children's Communication Checklist, 2nd version; CCC2). For the adopted group, analyses were also conducted to explore relationships between current behaviour and mentalizing skills (via SASI, SDQ and CCC2) and experiences prior to being adopted thought to play a part in a child's subsequent adjustment and mentalizing skills, including exposure to abuse, the number of foster placements, and the age of the child's removal from the birth family.

Statistical analysis revealed significant difference between the groups for parent-rated SDQ scores, with the parents of the adopted adolescents generally reporting higher scores, indicative of a greater number and level of problems. However, the SDQ scores for the adoption group and non-adoption did not indicate a clinical level of need. In terms of mentalizing skills, there were significant differences between the groups in one of the measures of mentalizing (cartoon animations) and also the social relationships subscale of the CCC2. These results suggest there may be a small effect of adoption on social functioning, compared with non-adoptees. There was no effect on mentalizing skills from aspects of care history, and this may be because the adoption sample that was recruited would be regarded as 'low-risk' in terms of the extent and severity of early adversity experienced. Overall, the study confirms previous research that adoption can enhance life chances for children who are born into extremely adverse circumstances.

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Appendix 1. Kmet checklist for assessing the quality of quantitative studies

	Criteria	YES (2)	PARTIAL (1)	NO (0)	N/A
1	Question / objective sufficiently described?				
2	Study design evident and appropriate?				
3	Method of subject/comparison group selection or source of information/input variables described and appropriate?				
4	Subject (and comparison group, if applicable) characteristics sufficiently described?				
5	If interventional and random allocation was possible, was it described?				
6	If interventional and blinding of investigators was possible, was it reported?				
7	If interventional and blinding of subjects was possible, was it reported?				
8	Outcome and (if applicable) exposure measure(s) well defined and robust to measurement / misclassification bias? means of assessment reported?				
9	Sample size appropriate?				
10	Analytic methods described/justified and appropriate?				
11	Some estimate of variance is reported for the main results?				
12	Controlled for confounding?				
13	Results reported in sufficient detail?				
14	Conclusions supported by the results?				

Appendix 1. Kmet checklist for assessing the quality of qualitative studies

Criteria		YES (2)	PARTIAL (1)	NO (0)
1	Question / objective sufficiently described?			
2	Study design evident and appropriate?			
3	Context for the study clear?			
4	Connection to a theoretical framework / wider body of knowledge?			
5	Sampling strategy described, relevant and justified?			
6	Data collection methods clearly described and systematic?			
7	Data analysis clearly described and systematic?			
8	Use of verification procedure(s) to establish credibility?			
9	Conclusions supported by the results?			
10	Reflexivity of the account?			

Appendix 2: Leaflet given to Adoption Group Participants

Contact Details

For further information please contact:

Alastair Barnett, Chartered Clinical Psychologist

[redacted]

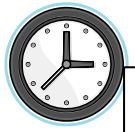
If you choose to join this study and, after taking part, you have any questions or if you feel upset, please telephone on the above number and I will get in touch to help.

WHAT IS THE RESEARCH ABOUT?

I am interested in the effects of early care experiences on how young people behave and get on with others. In this project I am hoping to find out if the age a child is adopted makes any difference to the development of these abilities.

Appendix 2: Leaflet given to Adoption Group Participants

What will I have to do? You will be asked to do two things. First, to meet me for one, possibly two meetings, and do some tests and exercises. These will help me to find out how you understand certain situations. One of the tests involves talking about some cartoons you'll see on a laptop computer. Secondly, I need you to complete a questionnaire about things you are good at and things you find difficult.



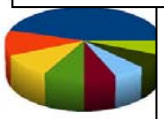
How long will it take? About an hour overall; sometimes a bit more.

Where will I have to go? I will come and see you, wherever you choose. Most people choose either to meet me at school or in another place such as the doctor's surgery. This way, you can keep your participation as private as you want to.

What else will happen? I will give questionnaires about how you behave and communicate to your parent[s] and a teacher who knows you well. I will also ask your parent for any information they have on what happened to you before you were adopted.

What will happen to the information? All information gathered is completely private. *Nobody* else will be able to see it. The results from the tests will not be shown to anyone. The only time I will have to tell staff any information is if you tell me that you are at risk of getting hurt, or someone else is.

Will anyone know if I take part? Nobody will be able to find out your name. I will use code-numbers instead of names to record results on a computer. You can change your mind about being involved at any point, up until I publish the results. If you do change your mind then I will remove all your scores from my results.



Will I be able to see my results? I will make a leaflet with general results of the research. However, nobody will be able to see their individual results so that they always remain private. All results will be stored securely.

How do I let you know if I want to take part or not? You let your parents know. If you are okay about joining in, you will be asked to read and sign a consent form. If you are under the age of 16 your parents will be asked to sign the consent form as well. If you do take part but change your mind and want to stop, this is okay. All your results will be destroyed.

?

What if I have more questions? You can ask your parent if you want or you can get hold of me, if needed. My contact details are on the back of this leaflet.

Why are you looking at this topic?

1. This research is part of my studies at Birmingham University.
2. Any findings will help us to understand more about how care of small children influences how we behave and get on with others in later life. It could mean other people who have been adopted get better help with any difficulties they are having.

Appendix 3: Letter sent to adoptive parents

Letter to (adoptive) parents:

Dear [parent]

Re: [child's name, dob, address]

Thank you for responding to the article I put recently in [the newsletter].

I am a clinical psychologist working in a child & adolescent mental health service in Worcestershire. I am interested in the effects of early maltreatment on children and young people who have subsequently been adopted, particularly in relation to their subsequent social and behavioural functioning.

My present study is exploring for differences in "Theory of Mind" abilities in adolescents who have been adopted, comparing those who were removed from their birth family earlier in infancy with those who were not removed until three or four years of age. Theory of Mind is a concept which is concerned with the ability of an individual to put themselves "in someone else's shoes", socially and/or emotionally. In another way, Theory of Mind is the capacity to realise and understand that other people may have different views and opinions to one's own. Adequate theory of mind functioning is associated with subsequent social success.

There is some suggestion in the research literature about Theory of Mind that experiences during the preschool years are key in the development of cognitive and emotional functioning and in the acquisition of adequate social perspective-taking skills. Because Theory of Mind is associated with positive social success, I am also attempting to explore if Theory of Mind functioning might also be correlated with academic attainment and behavioural adjustment in the secondary school age years. A leaflet is enclosed which offers more information and gives you a good idea as to what your son/daughter would be expected to do in participating in the project.

With the above in mind, I would be extremely grateful if you will consent to your child's participation in the study and also if you could complete the enclosed questionnaires concerning your child. All responses will be confidential and all data will be kept anonymous in the data analysis. Depending on preferences you and your child may have, I will undertake my assessment of him/her at school, at your home or in a neutral venue such as the doctor's surgery. Following completion of my study, I am happy to provide an account of my findings in this research, should you request this.

With many thanks,

Yours sincerely

Appendix 4: Information listed on adoption charity website

Help Needed from Young People with Research Project

Alastair Barnett is a clinical psychologist who has approached Adoption UK seeking to make contact with young people (11-16 years) who have been adopted, to participate in a research project.

He is interested in the effects of early care experiences on how young people behave, understand others and get on with them, and is looking to explore if the age a child is adopted makes any difference to the development of these abilities.

Alastair will arrange to meet any young people who are happy to take part and would need one or possibly two meetings. His assessment involves some tests and exercises and is confidential. Families in Central England are particularly encouraged to enquire! (Alastair is based at the University of Birmingham). Full details are available to all families who might be interested. Contact Sue Holland (Secretary) on 01XXX XXXXXX 1pm-5pm weekdays.

Appendix 5: Preplacement Information Form

EARLY HISTORY FORM

Ref No:…….

Name of Young Person……

Date of Birth……

Date of Removal from birth family (or age in mm/yy)……..

Date of Placement with You……..

Placing Agency of Authority……

Following Removal:

Number of foster placements with dates of moves if possible:
[please continue overleaf if possible]

1.

2.

3.

4.

5.

Birth Family Experiences:
Please tick all that apply:

	No	Possible	Confirmed	Extreme
Physical Abuse				
Neglect				
Emotional Abuse				
Sexual Abuse				
Poor Standards of Care				
Malnutrition				
Multiple Caregivers				
Exposure to violence				
Other [describe]				

Prenatal Experiences:
Please tick all that apply:

	No	Possible	Confirmed	Extreme
Exposure to alcohol				
Exposure to cigarette smoke				
Exposure to narcotics				

Appendix 6: Administration Scripts

Schedules for the Assessment of Social Intelligence (Skuse at al., 2005):

Introduction: in this set of exercises you will be asked to do three different things. All the exercises involve looking at faces and then giving your choice on the screen, using the mouse. All the exercises are run by the computer so I am just going to sit here and, if you need any help or aren't sure about anything, then please do ask me.

Eye Gaze Task: you will see a series of faces and will be asked if the person in the picture is looking right into your eyes, looking to your left, or looking to your right. Do you understand? Just click the box that gives your answer; "into my eyes", "to my left", or "to my right".

Emotion Task: I am going to show you a set of faces, one face at a time, and your job is to click the button on the screen which you think best describes the feeling being shown by the person in the picture. The words describing the feelings are on a pallete to the right of the picture. Do you understand what you have to do?

Face Memory Task: in this last exercise you are going to see more sets of faces. Firstly you will see a number of faces and will be asked to say if they are nice or not nice. Then, after you have seen them all, you will see a second set of faces, but this time shown two at a time, side by side. Your job is to click the button below the face you think you have seen in the first set. Do you understand what you have to do?

Abstract Animations

I am going to show you some short animated cartoons, each of around 40 seconds in length.

In each cartoon there will be two triangles which move about the screen and seem to interact in some way.

Please watch the cartoons and, when each one is finished, I am going to ask you to say what you think was happening in the cartoon.

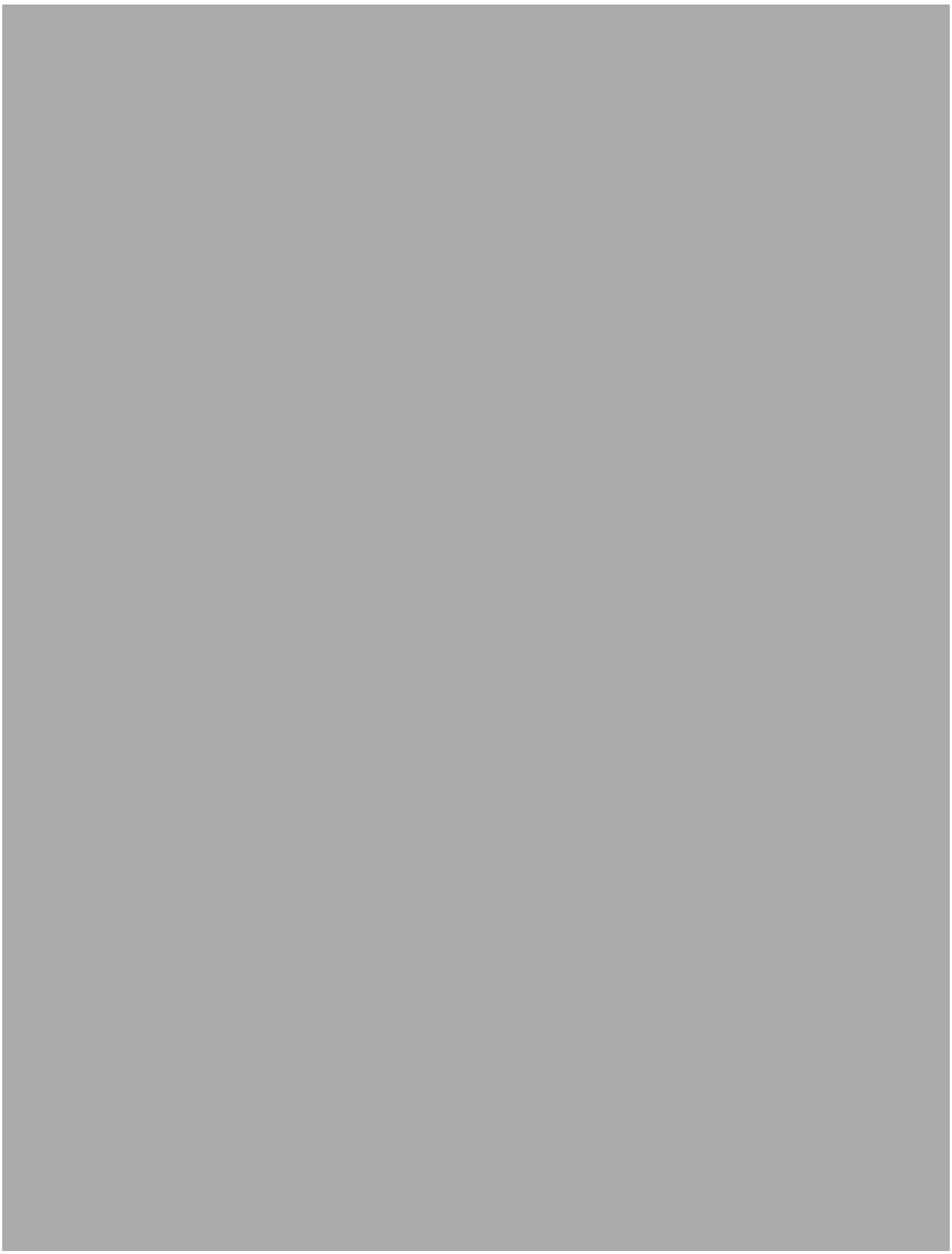
[show cartoon]

Afterward: Can you describe what you think was happening in that cartoon?

Specific feedback was not given, although each participant was given general praise and encouragement for their contribution.

All checklist data (the Youth Report Strengths & Difficulties questionnaire, the parent Strengths & Difficulties questionnaire, the Children's Communication Checklist, the consent form and (for the adoption group) the pre-adoptive placement history form were all completed during the assessment visit.

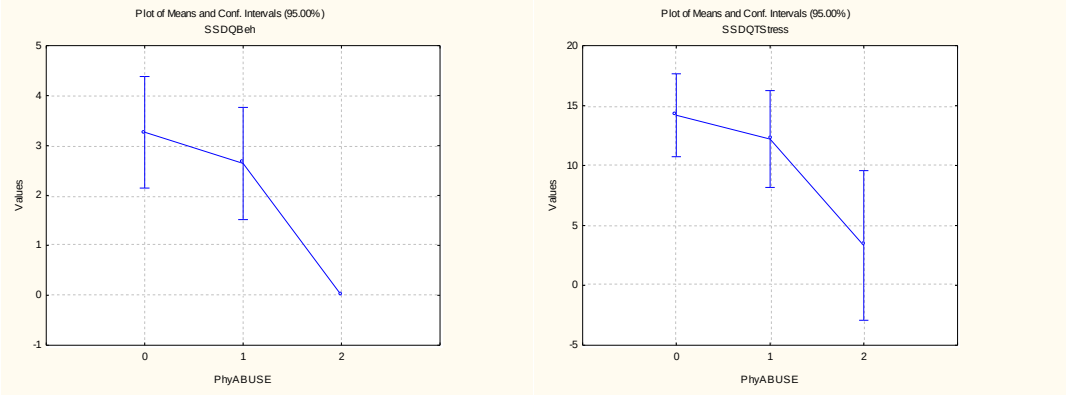
Appendix 7: Ethical Approval from University of Birmingham Human Ethics Committee



Appendix 8: ANOVAS between Early Experiences & Strengths and Difficulties Questionnaire Profiles.

(a) Physical Abuse

	SS - Effect	df - Effect	MS - Effect	SS - Error	df - Error	MS - Error	F	p
Parent Strengths and Difficulties Questionnaire								
Emotion	8.3940	2	4.1970	213.481	29	7.36141	0.570138	0.571658
Behaviour	3.9735	2	1.9868	344.495	29	11.87915	0.167247	0.846800
Attention/Hyperactivity	13.5190	2	6.7595	291.981	29	10.06831	0.671366	0.518774
Peer Relations	11.0048	2	5.5024	154.495	29	5.32742	1.032841	0.368721
Total Stress	65.9521	2	32.9760	2379.767	29	82.06092	0.401848	0.672750
Self-Rated Strengths and Difficulties Questionnaire								
Emotion	27.0449	2	13.5225	187.924	29	6.48013	2.086759	0.142329
Behaviour	26.7274	2	13.3637	106.148	29	3.66026	3.651019	0.038528
Attention/Hyperactivity	28.9045	2	14.4522	161.314	29	5.56256	2.598125	0.091640
Peer Relations	4.4000	2	2.2000	69.600	29	2.40000	0.916667	0.411125
Total Stress	295.4512	2	147.7256	1197.424	29	41.29048	3.577716	0.040856



(b) Neglect

Analysis of Variance (AB Data) Marked effects are significant at p < .05000

	SS - Effect	df - Effect	MS - Effect	SS - Error	df - Error	MS - Error	F	p
Parent-rated Strengths and Difficulties Questionnaire								
Emotion	20.7857	3	6.92857	201.089	28	7.18176	0.964746	0.423124
Behaviour	32.1116	3	10.70387	316.357	28	11.29847	0.947373	0.431096

Attention/Hyperactivity	61.6429	3	20.54762	243.857	28	8.70918	2.359305	0.092904
Peer Relations	26.0679	3	8.68929	139.432	28	4.97972	1.744935	0.180627
Total Stress	276.2902	3	92.09673	2169.429	28	77.47959	1.188658	0.331959
Self-Rated Strengths and Difficulties Questionnaire								
Emotion	28.1652	3	9.38839	186.804	28	6.67156	1.407227	0.261405
Behaviour	17.8750	3	5.95833	115.000	28	4.10714	1.450725	0.249243
Attention/Hyperactivity	2.6045	3	0.86815	187.614	28	6.70051	0.129565	0.941724
Peer Relations	16.2964	3	5.43214	57.704	28	2.06084	2.635885	0.069241
Total Stress	176.0179	3	58.67262	1316.857	28	47.03061	1.247541	0.311301

(c) Emotional abuse

Analysis of Variance (AB Data) Marked effects are significant at p < .05000								
	SS - Effect	**df - Effect**	**MS - Effect**	**SS - Error**	**df - Error**	**MS - Error**	**F**	**p**
Parent-rated Strengths and Difficulties Questionnaire								
Emotion	9.2417	3	3.08056	212.633	28	7.59405	0.405654	0.750093
Behaviour	22.0687	3	7.35625	326.400	28	11.65714	0.631051	0.601118
Attention/Hyperactivity	65.9000	3	21.96667	239.600	28	8.55714	2.567056	0.074470
Peer Relations	21.3667	3	7.12222	144.133	28	5.14762	1.383595	0.268257
Total Stress	206.4188	3	68.80625	2239.300	28	79.97500	0.860347	0.473119
Self-Rated Strengths and Difficulties Questionnaire								
Emotion	8.8688	3	2.95625	206.100	28	7.36071	0.401625	0.752919
Behaviour	1.8417	3	0.61389	131.033	28	4.67976	0.131180	0.940724
Attention/Hyperactivity	9.0187	3	3.00625	181.200	28	6.47143	0.464542	0.709316
Peer Relations	13.0667	3	4.35556	60.933	28	2.17619	2.001459	0.136612
Total Stress	79.9417	3	26.64722	1412.933	28	50.46190	0.528066	0.666669

(d) Sexual abuse

Analysis of Variance (AB Data) Marked effects are significant at p < .05000								
	SS - Effect	**df - Effect**	**MS - Effect**	**SS - Error**	**df - Error**	**MS - Error**	**F**	**p**
Parent-rated Strengths and Difficulties Questionnaire								
Emotion	4.4083	1	4.4083	217.467	30	7.24889	0.608139	0.441599
Behaviour	13.0021	1	13.0021	335.467	30	11.18222	1.162746	0.289491
Attention/Hyperactivity	17.6333	1	17.6333	287.867	30	9.59556	1.837656	0.185344
Peer Relations	7.5000	1	7.5000	158.000	30	5.26667	1.424051	0.242090
Total Stress	159.8521	1	159.8521	2285.867	30	76.19556	2.097919	0.157872
Self-Rated Strengths and Difficulties Questionnaire								
Emotion	0.3169	1	0.3169	214.652	30	7.15506	0.044290	0.834738
Behaviour	1.4083	1	1.4083	131.467	30	4.38222	0.321374	0.575000
Attention/Hyperactivity	6.4558	1	6.4558	183.763	30	6.12543	1.053932	0.312810
Peer Relations	0.7259	1	0.7259	73.274	30	2.44247	0.297210	0.589667
Total Stress	26.4454	1	26.4454	1466.430	30	48.88099	0.541015	0.467724

(e) Poor infant care

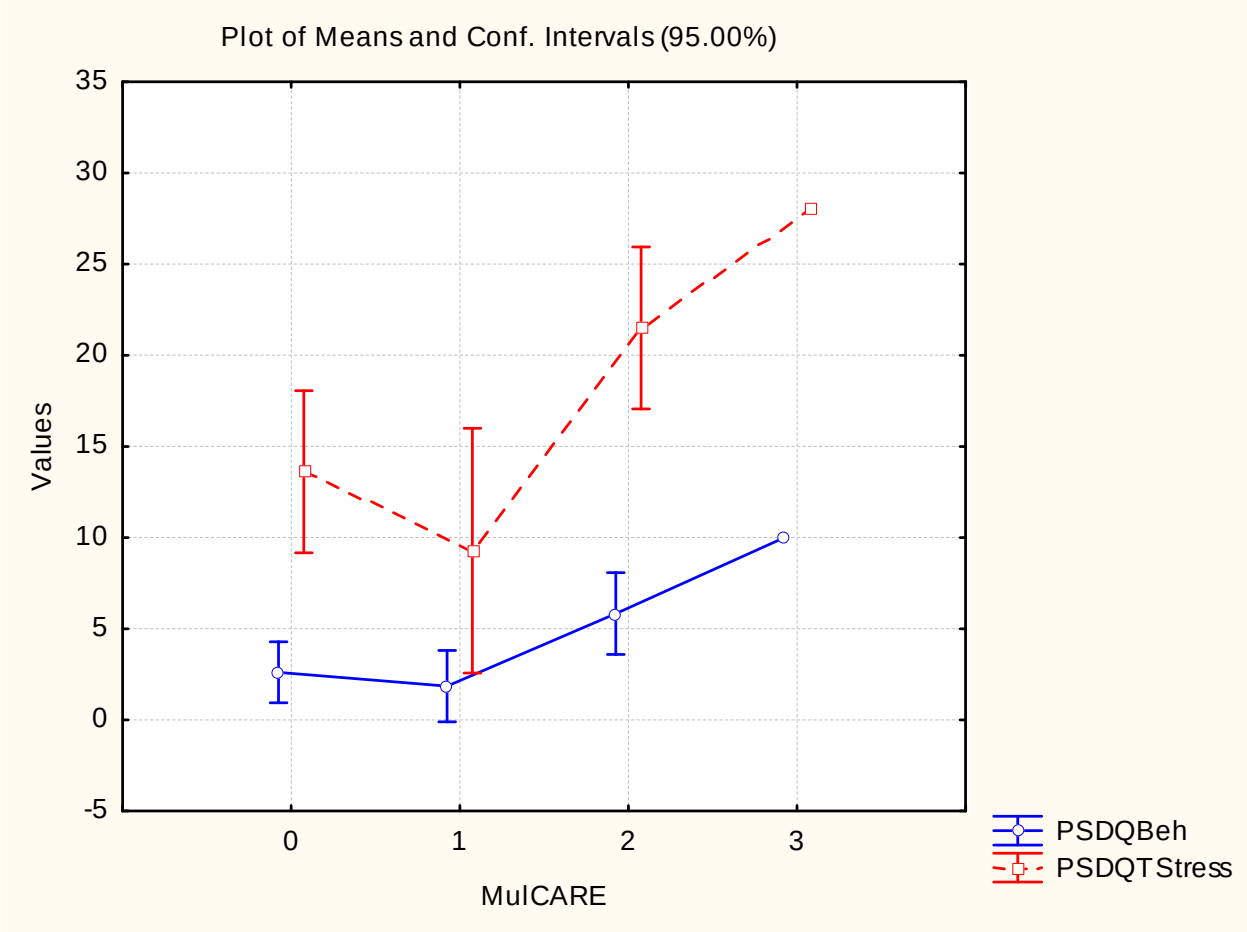
Analysis of Variance (AB Data) Marked effects are significant at p < .05000								
	SS - Effect	**df - Effect**	**MS - Effect**	**SS - Error**	**df - Error**	**MS - Error**	**F**	**p**
Parent-rated Strengths and Difficulties Questionnaire								
Emotion	34.7083	3	11.5694	187.167	28	6.68452	1.730781	0.183441
Behaviour	45.4188	3	15.1396	303.050	28	10.82321	1.398807	0.263826
Attention/Hyperactivity	66.6333	3	22.2111	238.867	28	8.53095	2.603591	0.071645
Peer Relations	18.4111	3	6.1370	147.089	28	5.25317	1.168253	0.339422
Total Stress	376.5465	3	125.5155	2069.172	28	73.89901	1.698474	0.190034
Self-Rated Strengths and Difficulties Questionnaire								
Emotion	7.1132	3	2.3711	207.856	28	7.42341	0.319404	0.811241
Behaviour	2.1028	3	0.7009	130.772	28	4.67044	0.150077	0.928768
Attention/Hyperactivity	14.7965	3	4.9322	175.422	28	6.26508	0.787249	0.511174
Peer Relations	3.6611	3	1.2204	70.339	28	2.51210	0.485796	0.694877
Total Stress	33.1861	3	11.0620	1459.689	28	52.13175	0.212194	0.887100

(f) Malnourishment

Analysis of Variance (AB Data) Marked effects are significant at p < .05000								
	SS - Effect	**df - Effect**	**MS - Effect**	**SS - Error**	**df - Error**	**MS - Error**	**F**	**p**
Parent-rated Strengths and Difficulties Questionnaire								
Emotion	9.0970	3	3.03232	212.778	28	7.59922	0.399031	0.754740
Behaviour	15.0657	3	5.02191	333.403	28	11.90725	0.421752	0.738844
Attention/Hyperactivity	59.4492	3	19.81641	246.051	28	8.78753	2.255062	0.103889
Peer Relations	23.8432	3	7.94773	141.657	28	5.05917	1.570954	0.218489
Total Stress	282.5407	3	94.18024	2163.178	28	77.25636	1.219061	0.321132
Self-Rated Strengths and Difficulties Questionnaire								
Emotion	15.5233	3	5.17443	199.445	28	7.12305	0.726435	0.544795
Behaviour	2.3083	3	0.76944	130.567	28	4.66310	0.165007	0.919041
Attention/Hyperactivity	4.6187	3	1.53958	185.600	28	6.62857	0.232265	0.873121
Peer Relations	10.4129	3	3.47096	63.587	28	2.27097	1.528405	0.228911
Total Stress	79.1000	3	26.36667	1413.775	28	50.49196	0.522195	0.670544

(g) Multiple Caregivers

Analysis of Variance (AB Data) Marked effects are significant at p < .05000								
	SS - Effect	**df - Effect**	**MS - Effect**	**SS - Error**	**df - Error**	**MS - Error**	**F**	**p**
Parent-rated Strengths and Difficulties Questionnaire								
Emotion	26.1607	3	8.7202	195.714	28	6.98980	1.247567	0.311292
Behaviour	106.5005	3	35.5002	241.968	28	8.64172	4.107996	0.015548
Attention/Hyperactivity	55.5079	3	18.5026	249.992	28	8.92829	2.072362	0.126511
Peer Relations	28.1746	3	9.3915	137.325	28	4.90448	1.914890	0.150081
Total Stress	680.5124	3	226.8375	1765.206	28	63.04308	3.598134	0.025718
Self-Rated Strengths and Difficulties Questionnaire								
Emotion	8.6434	3	2.8811	206.325	28	7.36876	0.390991	0.760396
Behaviour	16.6131	3	5.5377	116.262	28	4.15221	1.333675	0.283324
Attention/Hyperactivity	21.8934	3	7.2978	168.325	28	6.01162	1.213946	0.322929
Peer Relations	0.8651	3	0.2884	73.135	28	2.61196	0.110400	0.953308
Total Stress	77.6687	3	25.8896	1415.206	28	50.54308	0.512227	0.677156


Plot of Means and Conf. Intervals (95.00%)
35
30
25
20
15
10
5
0
-5
Values
0
1
2
3
MulCARE
PSDQBeh
PSDQTStress

(h) Exposure to violence

Analysis of Variance (AB Data) Marked effects are significant at p < .05000								
	SS - Effect	**df - Effect**	**MS - Effect**	**SS - Error**	**df - Error**	**MS - Error**	**F**	**p**
Parent-rated Strengths and Difficulties Questionnaire								
Emotion	19.23397	3	6.41132	202.641	28	7.23718	0.885887	0.460421
Behaviour	23.87901	3	7.95967	324.590	28	11.59249	0.686623	0.567773
Attention/Hyperactivity	10.66026	3	3.55342	294.840	28	10.52999	0.337457	0.798362
Peer Relations	6.08974	3	2.02991	159.410	28	5.69322	0.356549	0.784771
Total Stress	76.10978	3	25.36993	2369.609	28	84.62889	0.299779	0.825252
Self-Rated Strengths and Difficulties Questionnaire								
Emotion	6.65465	3	2.21822	208.314	28	7.43979	0.298156	0.826410
Behaviour	1.85577	3	0.61859	131.019	28	4.67926	0.132198	0.940091
Attention/Hyperactivity	5.62901	3	1.87634	184.590	28	6.59249	0.284617	0.836066
Peer Relations	8.23077	3	2.74359	65.769	28	2.34890	1.168031	0.339504
Total Stress	43.46474	3	14.48825	1449.410	28	51.76465	0.279887	0.839436

(i) Exposure to Alcohol

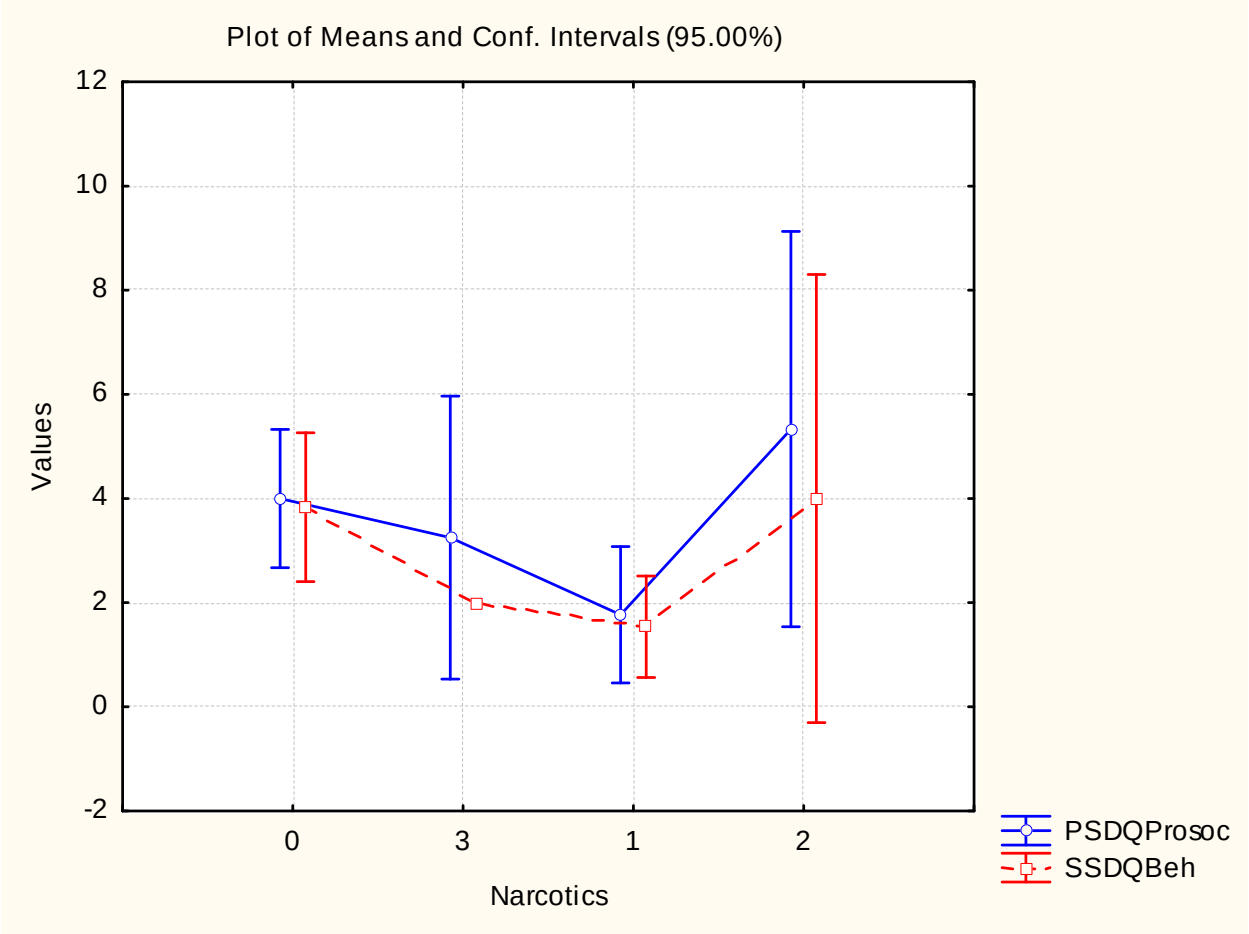
Analysis of Variance (AB Data) Marked effects are significant at p < .05000								
	SS - Effect	**df - Effect**	**MS - Effect**	**SS - Error**	**df - Error**	**MS - Error**	**F**	**p**
Parent-rated Strengths and Difficulties Questionnaire								
Emotion	60.1211	3	20.0404	161.754	28	5.77693	3.469035	0.029283
Behaviour	66.6942	3	22.2314	281.775	28	10.06338	2.209141	0.109148
Attention/Hyperactivity	45.0843	3	15.0281	260.416	28	9.30056	1.615828	0.208015
Peer Relations	10.7343	3	3.5781	154.766	28	5.52735	0.647346	0.591189
Total Stress	522.6266	3	174.2089	1923.092	28	68.68186	2.536461	0.076925
Self-Rated Strengths and Difficulties Questionnaire								
Emotion	12.9001	3	4.3000	202.069	28	7.21674	0.595843	0.622993
Behaviour	15.2338	3	5.0779	117.641	28	4.20147	1.208610	0.324814
Attention/Hyperactivity	56.8266	3	18.9422	133.392	28	4.76401	3.976107	0.017684
Peer Relations	12.6461	3	4.2154	61.354	28	2.19121	1.923757	0.148640
Total Stress	297.7564	3	99.2521	1195.119	28	42.68281	2.325342	0.096344

(j) Exposure to Cigarette Smoke

Analysis of Variance (AB Data) Marked effects are significant at p < .05000								
	SS - Effect	**df - Effect**	**MS - Effect**	**SS - Error**	**df - Error**	**MS - Error**	**F**	**p**
Parent-rated Strengths and Difficulties Questionnaire								
Emotion	14.2750	3	4.75833	207.600	28	7.41429	0.641779	0.594567
Behaviour	59.9790	3	19.99300	288.490	28	10.30321	1.940464	0.145965
Attention/Hyperactivity	14.1641	3	4.72137	291.336	28	10.40485	0.453766	0.716697
Peer Relations	21.4077	3	7.13590	144.092	28	5.14615	1.386647	0.267363
Total Stress	223.8623	3	74.62078	2221.856	28	79.35201	0.940377	0.434346
Self-Rated Strengths and Difficulties Questionnaire								
Emotion	2.9277	3	0.97591	212.041	28	7.57289	0.128869	0.942155
Behaviour	22.1673	3	7.38910	110.708	28	3.95385	1.868839	0.157794
Attention/Hyperactivity	37.8495	3	12.61651	152.369	28	5.44176	2.318461	0.097056
Peer Relations	3.5410	3	1.18034	70.459	28	2.51639	0.469061	0.706232
Total Stress	172.7750	3	57.59167	1320.100	28	47.14643	1.221549	0.320261

(k) Parental use of Narcotics

Analysis of Variance (AB Data) Marked effects are significant at p < .05000								
	SS - Effect	**df - Effect**	**MS - Effect**	**SS - Error**	**df - Error**	**MS - Error**	**F**	**p**
Parent-rated Strengths and Difficulties Questionnaire								
Emotion	27.5224	3	9.1741	194.353	28	6.94116	1.321701	0.287060
Behaviour	48.3918	3	16.1306	300.077	28	10.71703	1.505138	0.234821
Attention/Hyperactivity	13.8333	3	4.6111	291.667	28	10.41667	0.442667	0.724340
Peer Relations	47.7756	3	15.9252	117.724	28	4.20444	3.787712	0.021291
Total Stress	371.6162	3	123.8721	2074.103	28	74.07509	1.672250	0.195562
Self-Rated Strengths and Difficulties Questionnaire								
Emotion	20.0713	3	6.6904	194.897	28	6.96062	0.961184	0.424747
Behaviour	39.9776	3	13.3259	92.897	28	3.31777	4.016515	0.016998
Attention/Hyperactivity	28.9623	3	9.6541	161.256	28	5.75916	1.676307	0.194696
Peer Relations	6.1026	3	2.0342	67.897	28	2.42491	0.838872	0.484034
Total Stress	322.3109	3	107.4370	1170.564	28	41.80586	2.569902	0.074246


Plot of Means and Conf. Intervals (95.00%)
12
10
8
6
4
2
0
-2
Values
0
3
1
2
Narcotics
PSDQProsoc
SSDQBeh