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University of Southampton

Faculty of Environmental and Life Sciences

Psychology

**The Impact of Child-Parent Relationship Quality on Neurodevelopmental Problems
in Adoptees**

by

Carmen María Caro-Morente

Thesis for the degree of Doctorate in Clinical Psychology

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Abstract

Faculty of Environmental and Life Sciences

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Doctor of Philosophy

The Impact of Child-Parent Relationship Quality on Neurodevelopmental Problems in
Adoptees

By

Carmen María Caro-Morente

Childhood maltreatment has previously been associated with neurodevelopmental (ND) problems, including Attention Deficit Hyperactivity Disorder and Autism Spectrum Disorder symptoms. Attachment plays an important role in neurodevelopment; however, its role in adoptees who suffered maltreatment and their adoptive parents, has not yet been fully explored. A review of a range of attachment-based interventions has tentatively suggested that attachment-based interventions may reduce neurodevelopmental problems in looked after children.

This exploratory study aimed to provide greater understanding on how child maltreatment affects neurodevelopmental problems and how the parent-child relationship with the adoptive parents, may play a role in this, as a moderator or protective factor.

Data from 94 children 6 to 11 years old, adoptees with a history of maltreatment (n=26) and biological children without experiences of maltreatment (n=68), was analysed to explore the relationship between maltreatment and ND outcomes. A moderation analysis was run to see whether parent-child relationship had an influence on that association. Results indicated that adoptees had significantly higher scores on inattention and hyperactivity. Adoptees were three times more likely to meet screening criteria for further autism assessment. The moderation analysis was not significant.

Findings were consistent with previous research, where child maltreatment has been associated with ND outcomes. However, despite previous evidence indicating that the attachment relationship may influence the ND problems in children in care, our hypothesis of this relationship being a potential protective factor was not confirmed. There were significant power issues due to the small sample of adoptees.

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Research Thesis: Declaration of Authorship

Print name: CARMEN MARÍA CARO-MORENTE

Title of thesis: The Impact of Child-Parent Relationship Quality on Neurodevelopmental Problems in Adoptees

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission

Signature:Date:

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To my family for always being there supporting me.

Definitions and Abbreviations

ND	Neurodevelopmental
ADHD.....	Attention Deficit and Hyperactivity Disorder
ASD.....	Autism Spectrum Disorder
EF	Executive Functioning
LAC.....	Looked After Children
RFP.....	Reflective Fostering Programme
ABC-T.....	Attachment and Behavioural Catch-up for Toddlers
NPP.....	Neuro-Physiological Psychotherapy
DDP.....	Dyadic Developmental Psychotherapy

Chapter 1 Effect of attachment-based interventions on neurodevelopmental problems in children in alternative care: a systematic review.

Intent to publish in Journal:

Developmental Child Welfare

Publication criteria:

The manuscript should conform to APA publishing style and must include an abstract containing a maximum of 250 words. All manuscripts should be clearly organized, with a clear hierarchy of headings and subheadings (3 weights maximum). Review articles should not exceed 9,000 words (including references, tables and figures, but excluding the abstract).

1.1 Abstract

The links between attachment and neurodevelopmental (ND) outcomes in maltreated children have been explored but this work has largely relied on correlational designs. A range of attachment-based interventions have been shown to promote better outcomes for looked-after children across a range of psychosocial measures. The aim of this systematic review is to extend this body of research by exploring the specific effects of attachment-based interventions on ND outcomes in children in care. Five databases (CINAHL, MEDLINE, APA PsycInfo, Web of Science and PubMed) were searched together with backward and forward citation searches of selected papers. Fourteen papers, including two dissertations, met the inclusion criteria. Included studies varied in terms of study designs, characteristics of interventions and samples, and the overall quality of the studies. Conclusions were difficult to reach but there is some tentative evidence to suggest that attachment-based interventions may reduce neurodevelopmental problems in looked-after children. Further research is needed to assess the impact of attachment-based interventions on children's neurodevelopmental outcomes.

Key words: Attachment, Attachment-based interventions, Neurodevelopment, Children in Care, Foster Care, Looked After Children, Adoptees, Attention Deficit and Hyperactivity Disorder, ADHD, ASD, Executive Functioning

1.2 Introduction

The majority of children who are taken into care have experienced abuse, neglect or significant family dysfunction (Department for Education, 2020; Oswald et al., 2010). Early childhood maltreatment has been linked to alterations in neurobiological systems (Berens et al., 2017; Nelson et al., 2011) and children presenting with neurodevelopmental difficulties (Dinkler et al., 2017). Neurodevelopmental problems are typically reflected in impaired functioning in cognition, learning, motor skills, and/or communication. They can include a very wide range of neurological and psychological problems but, in this article, we will focus on the most common neurodevelopmental problems found in relation to childhood maltreatment and neglect.

More specifically, childhood maltreatment has been linked to symptoms of Attention Deficit Disorder (ADHD) (Clayton et al., 2018; González et al., 2019), Executive Functioning (EF) deficits (Lund et al., 2020) and, in cases of severe maltreatment (Kočovská et al., 2012) or histories of severe early institutional deprivation (Kreppner et al., 2010), Autism traits. Although these conditions have a genetic basis, maltreatment can nevertheless contribute to the symptom expression or severity (Perry, 2008). For instance, clinically relevant small effects have been found of childhood maltreatment on symptoms of ADHD and ASD in the presence of significant genetic and biological factors (Craig et al., 2020; Dinkler et al., 2017).

Regarding ADHD, findings to date include associations between ADHD and childhood maltreatment. For instance, Clayton et al. (2018) found in their meta-analysis a significant correlation between ADHD and experiences of maltreatment. Prospective associations have been found in a longitudinal study (González et al., 2019) examining the risk of ADHD following maltreatment, highlighting physical abuse as a particular risk. Additionally, there is an overlap

between ADHD symptoms and PTSD symptoms: such as hypervigilance and difficulties with attention (APA, 2013) which may result from maltreatment and present as ADHD (Lugo-Candelas et al., 2020; Weinstein et al., 2000).

Another recent meta-analysis has found a strong relationship between maltreatment and EF deficits (Lund et al., 2020). Dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis following child maltreatment, has implications for other areas of brain development, including the prefrontal cortex, which is involved with Executive Functioning.

1.2.1 Links between ND outcomes and attachment

Early experiences within the parent (caregiver)-child attachment relationship are argued to shape neurological, psychological and social development (Newman et al., 2015) and to play a critical role in the development of children's self-regulatory abilities. Specifically, regulation of infants' physiological arousal is dependent on their caregivers' sensitivity and responsiveness. Over time, infants gradually internalize these experiences of co-regulation and the learned regulatory strategies become their templates for future self-regulation. Self-regulatory capacities are thus heavily influenced by the experience of regulation provided by caregivers (Sameroff, 2010). Early deprivation of comfort and security within that caregiver-child relationship has been found to have adverse sequelae on a broad range of domains: neurological, psychological, emotional and physical development (Newman et al., 2015).

Research has linked variations in parental responsiveness and sensitivity to variations in their children's neurodevelopment, particularly ADHD. Sensitive parenting has been observed to buffer against harmful neurodevelopmental effects of early adverse experiences (Lind et al., 2017). Maternal responsivity in particular, has been found to influence the consequences of early adversity (Laucht et al., 2001).

Given the critical importance of the caregiver-child relationship for neurobiological development and the conceptual and empirical notion that plasticity in neurobiological development continues across childhood and adolescence (Teicher et al., 2016), interventions which target parental sensitivity and responsiveness, and have been shown to be effective to enhance the quality of the parent-child relationship, may, by extension, also reduce children's neurodevelopmental problems (Lind et al., 2017).

As mentioned before, the ND problems most commonly reported in children with histories of maltreatment include ADHD, EF deficits and, in severe early deprivation, ASD traits. Moreover, these specific NDs have all been linked to attachment. Executive Functioning has been theoretically and empirically linked to attachment (Bernier et al., 2010, 2015) through shared influences of early parenting experiences, specifically parental sensitivity (Fay-Stammach et al., 2014). Prospective studies have shown that attachment problems in early childhood significantly increase the risk for ADHD later in childhood (Storebø et al., 2016). And attachment (in)security has also been associated with ASD symptoms following early institutional deprivation (Sonuga-Barke et al., 2020).

1.2.2 Attachment-based interventions for children in care

For maltreated children who are in care, there is sparse evidence regarding treatment efficacy for neurodevelopmental outcomes or externalising disorders, and effectiveness of therapeutic approaches has proven to be mixed. While parent training programmes based on Social Learning Theory have yielded positive results for birth parents, there is limited evidence to support their effectiveness in reducing the complex difficulties presented by children who have suffered maltreatment and are in care (McCullough & Mathura, 2019). In an attempt to overcome

these shortcomings, the focus has been on adapting these programmes. Specifically, it has involved acknowledging the importance of attachment difficulties (Laybourne et al., 2008) which have been understood to be at the root of many of the difficulties experienced by children in the care system. Based on a literature review, Bath (2008) proposed three pillars of trauma-informed care that are necessary for helping these children: Felt-Safety, Self-Regulation and Connection. These appear to be fundamental elements of established interventions such as Attachment, Self-Regulation, and Competency Model (ARC; Arvidson et al., 2011), Attachment and Biobehavioral Catch-Up (Dozier et al., 2008) and Circle of Security (Hoffman et al., 2006).

Other well-known approaches, such as the Dyadic Developmental Psychotherapy (DDP; Hughes, 2003) have been developed in particular for children who have experienced maltreatment and intrafamilial trauma. The Parent-Child Interaction Therapy (PCIT; Eyberg et al., 1995) is an empirically supported treatment for children with disruptive behaviour that has been adapted to children in care (McNeil et al., 2005; Mersky et al., 2016).

Additionally, Fonagy et al. (1991) have reported that the child's attachment security and the quality of the mother-child relationship is predicted by the mother's ability to think about their own and their child's mental states, and how these underlie behaviour: reflective functioning. This has given rise to interventions that promote reflective functioning, such as the Reflective Fostering Programme (Redfern et al., 2018).

All these interventions recognise the importance of intervening within the context of the caregiving relationship, as behaviour management strategies are not effective if they are not used appropriately by safe, nurturing adults in the context of the safety, security and sensitivity of a healthy attachment relationship (Purvis et al., 2015).

1.2.3 Rationale and aim of this review

Prior research in this area has relied largely on correlational designs, not allowing for causal interpretations. More recent studies have extended this body of research and strengthened causal claims by providing evidence that experimental manipulation of parents' sensitivity and responsiveness in the caregiving behaviour leads to improvements in children's cognitive self-regulation abilities (Lind et al., 2017). There are, however, very few studies to date, and even fewer randomised controlled trials that look at interventions aimed at improving the attachment relationship whilst measuring neurodevelopmental outcomes. The purpose of this review is to examine whether attachment-based interventions have positive effects on the neurodevelopmental outcomes in children in alternative care. The primary question posed is: Are attachment-based interventions effective for reducing neurodevelopmental problems in children in alternative care? Secondary question: Are changes in child attachment or in parental sensitivity and responsiveness possible mediators of change in neurodevelopmental problems?

1.3 Review Method

A protocol of this review can be found in PROSPERO (reg. number: 220154). PRISMA guidelines were followed throughout (Moher et al., 2009). The searches of the literature were conducted between September and November 2020 on the following databases: CINAHL, MEDLINE and APA PsycInfo (these three via EBSCO), Web of Science and PubMed. Additionally, Citation Chaining with backward and forward chaining was conducted through the papers that met the inclusion criteria and were selected from screening. Forward chaining was conducted through searching on the Web of Science the papers included in the review.

1.3.1 Selection criteria

Following the PICO framework (Schardt et al., 2007), the following inclusion and exclusion criteria were developed, and studies were screened against the following inclusion criteria:

Participants: children and adolescents (0-18 years old) in alternative care, including adoptees, children in foster care, kinship care, looked after children, institutionalised children; and their carers. Excluding children living with or reunited with biological parents, and children at risk of going into care.

Interventions: Attachment-based interventions, including any type of intervention that targets predictors of attachment quality; including carer's sensitivity, responsiveness and warmth. Only interventions that involve the main caregiver were included (e.g., Not the teacher or social worker). Excluding: intervention where the main target is not the caregiver-child relationship or attachment based-interventions combined with other interventions that target directly ND problems (i.e., medication).

Comparison: Studies with any type of control group were included in the review (e.g., waiting list, care as usual, treatment as usual, and active comparison groups), and studies without control group were also included.

Outcomes: changes in ADHD symptoms, ASD symptoms, and executive functioning as measured by standardised measures (e.g., ADHD related scores on CBCL, SDQ, Conners CBRS; executive function measures such as: BRIEF, TOVA, SNAP, BASC; and Autism traits or symptoms scores in measures such as the ADOS, ADI-R, SCQ or AQ. Additional outcome measures on attachment, parent-child relationship quality, parental sensitiveness/responsiveness, and attachment disorder symptoms were also extracted when available.

Settings: no criteria were set on this.

Designs: any type of intervention studies were included: randomised, quasi and non-randomised trials, pre and post comparison trials, open trials, and pilot and feasibility studies if they had measured outcomes. Narrative papers, non-intervention studies, qualitative designs, and case studies were excluded.

There were no restrictions on language or publication date. Only peer reviewed journal articles and dissertations were included. Book chapters, and conference presentations where only the abstract is available were excluded.

1.3.2 Search strategy

The following key search terms and their synonyms were used in the search: attachment, parent-child relationship, sensitivity/responsiveness, adoptees or children in care, and neurodevelopmental problems specifying ADHD, ASD and executive functioning problems. For the detailed list of search terms see Appendix 1. Specific intervention names were included in the strategy as some relevant papers were not being picked up by the search as they did not have the word 'attachment' in the title or abstract. The names of additional interventions were extracted from previous systematic reviews relevant in the field (Kerr & Cossar, 2014; Kinsey & Schlösser, 2013; Mountain et al., 2017; Rose & O'Reilly, 2017). The same process applied for including specific names of measures on the search strategy. By listing the neurodevelopmental problems alone, many papers were being missed, therefore, after running scoping searches, it was thought that including the tools that measure them would provide more results that would be potentially relevant.

Screening of studies title and abstract was performed by the author and an independent reviewer (MMF) against the inclusion and exclusion criteria. Five discrepancies were found at this phase and were resolved by consensus. From the database searches and citation chaining 81 full-text were assessed for eligibility by the two reviewers. (see Table 1, Figure 1).

1.3.3 Quality assessment

Risk of Bias assessment was undertaken independently by the main author and an additional quality assessor (ER) using Downs and Blacks (1998) 27-item checklist for randomised and non-randomised studies. Discrepancies were discussed and consensus was reached.

1.3.4 Data extraction

Data extracted included: study characteristics, sample characteristics, intervention characteristics and outcome measures (focusing on neurodevelopmental problems and attachment) which was reported following the PRISMA guidelines (Moher et al., 2009) in a data extraction table, and following a formal narrative synthesis approach. There was an initial plan for subgroup analyses of pooled results for care type (fostered, adopted, etc.), developmental periods (infancy/early childhood, middle childhood and adolescence), type of attachment intervention, type of neurodevelopmental problem (ADHD, ASD, or EF problems) and study design (whether they had control group or not).

1.4 Results of the Review

The database search yielded 278 papers, 7 full-text papers were selected after screening. Citation chaining was conducted on these 7, yielding an additional 42 articles through backward chaining and 29 articles through forward chaining. Following screening, a further 6 full-text were selected to include in the review. Citation chaining was conducted again on these, yielding a

further 23 articles through backward chaining and 30 articles through forward chaining. After screening, 1 more full-text was included in the review. In sum, a total of 14 papers were included in this review.

All articles followed the same systematic process for inclusion and exclusion, and were consistently evaluated according to their applicability to the research question.

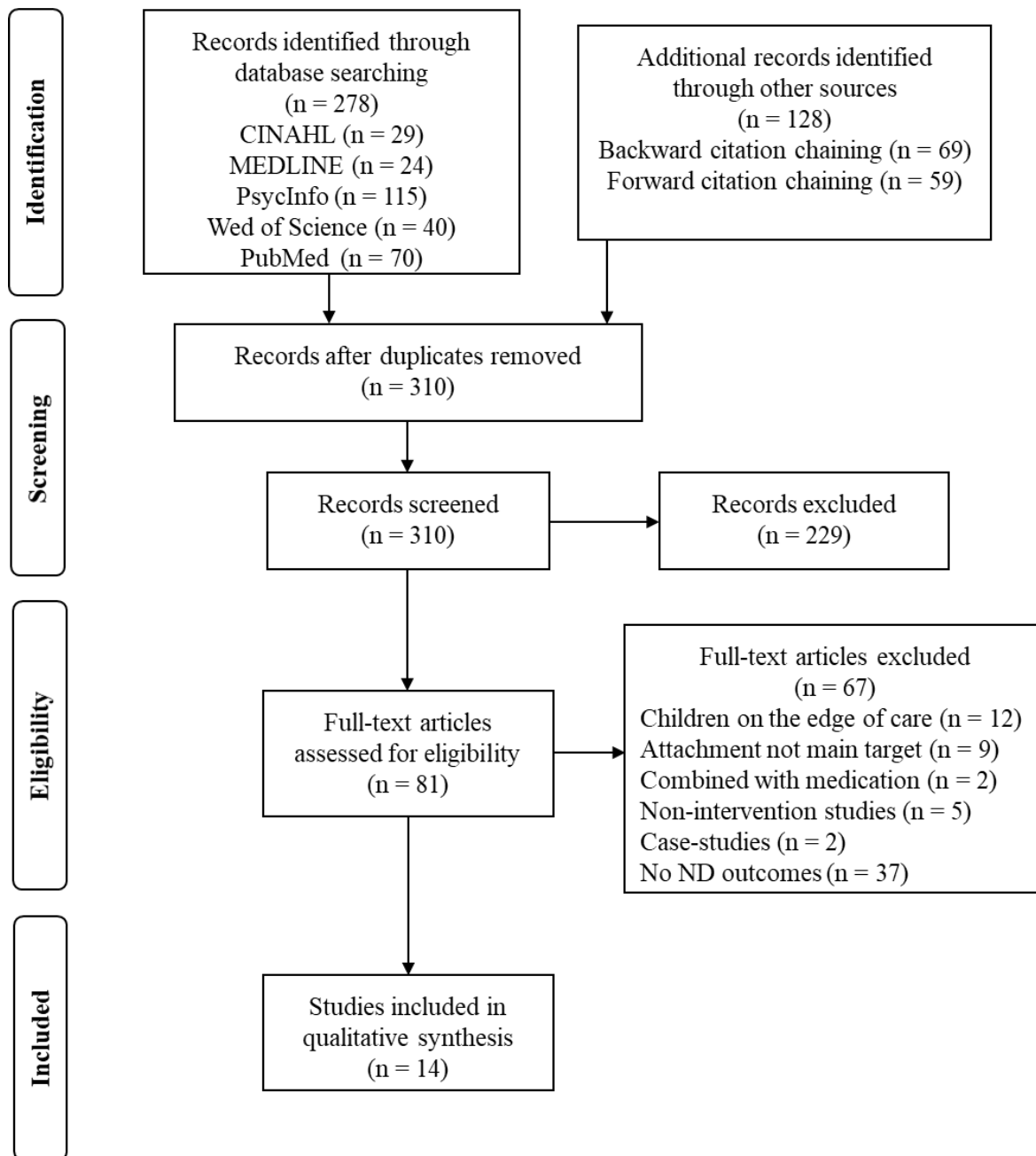


Figure 1 Flow diagram of screening and selection following PRISMA guidelines (Moher et al., 2009).

1.4.1 Quality of included studies

The quality of the studies included in the review was mixed (for details see Appendix B).

Following previously reported quality levels (Hooper et al., 2008), three of the studies (1, 3, and

13) had good quality, ten (2, 4, 5, 6, 7, 8, 9, 10, 12 and 14) had fair quality, and one (11) was of poor quality. Most of the studies had strong reporting, allowing the reader to make an unbiased assessment of the findings and external validity. Most studies had high bias in the measurement of the intervention and outcome, as none of them blinded the subjects to the intervention (which is understandably difficult in psychological interventions) and only three made an attempt to blind those measuring the outcomes (3, 4 and 13). Selection bias was also high amongst the studies as only three studies had some level of randomisation (1, 3, and 5). Power was difficult to assess as most studies did not report on this.

Table 1 Summary of the main characteristics of the studies included in the review

Authors and year	Country	Population		Study Design		Intervention	Setting, format or delivery	ND Outcomes	Secondary Outcome: Attachment	Effect Sizes
		Participants	Child Characteristics	Control group	Follow-up					
Moody, et al., 2020 (1)	UK	Foster carers (n=312). TG (n=204), CAU (n=108)	Children older than 2 years old, 12+ weeks in Foster Care. History of adverse childhood experiences (ACE) reported	Yes, CAU	12 months	Fostering Changes programme - aims to build positive relationships between carers and children, through a practical skills-based approach. It also aims to improve foster carers' understanding of the causes of children's social and emotional difficulties. It is based on social learning theory and attachment theory.	Group based training for foster parents. 12 weekly sessions x 3 hours and a support group meeting on first 3 terms after completion	Improvement on Hyperactivity subscale (SDQ) scores, but not significant difference between groups.	No significant differences between groups in Quality of attachment (QUARQ).	Unadjusted effect size of SDQ total score: -0.34 at 3 months and -0.04 at 12 months
Midgley, et al., 2019 (2)	UK	Foster carers (n=28)	Children's age M= 8.85 (SD=2.33) years, 61.5% female, average on placement +2 years M=16.32 months (SD= 22.38)	No	12 weeks after end programme	Reflective Fostering Programme (RFP) - builds on the reflective parenting model, which promotes both self-focused and child-focused reflective functioning within a context of managing emotional states and stress. Parental Reflective Functioning (mind-mindedness) has been shown to be associated with important facets of parenting such as sensitive caregiving, tolerance of infant distress, strengthened parent-child relationships, and secure attachment.	Group based intervention. 10 weekly 3h sessions delivered by two facilitators to groups of 6-10 foster carers. Participants divided in 4 groups (n=6, n=5, n=7, n=10)	Non-significant improvement on Hyperactivity subscale (SDQ) scores.	No significant improvement in all subscales of both reflective functioning measures (PRFQ and RFQ)	Cohen d hyperactivity score: d=0.17 [-0.37,0.85]

Lind, et al., 2017 (3)	USA	Foster and kinship carers (17.5%). Treatment group (n=63), control group (DEF) (n=58) and low risk dyads from intact families (n=52). Total of n=173 parent-toddler dyads.	Intervention group: age M=29.9 months (SD=9.5), 57.1% male, average on placement 28.3 months (SD=14.2). History of ACE reported	Yes, Developmental Education for Families (DEF) control intervention, low risk intact families group	1 month after completion	Attachment and Biobehavioral Catch-up for Toddlers (ABC-T) was designed to help foster parents behave in sensitive and nurturing ways, promoting the development of secure attachment relationships and supporting children's physiological and behavioral regulation. ABC-T focuses on helping the parent stay physically and psychologically available to the child, thus serving as an effective coregulator.	Delivered individually at home with parent-child dyad. 10 manualised sessions.	ABC-T group and the low-risk comparison group had significantly lower Attention Problems scores (CBCL) than children in the DEF group. There were no significant differences in attention problems between the ABC-T and low-risk groups at postintervention. There were no pre- scores for DCCS as children were too young pre-intervention. Post-intervention, the ABC-T group performed significantly better than the children in the DEF intervention but not significantly different from the low-risk group.	No attachment outcomes.	Main effect for group $\eta^2 = 0.08$, ABC-T group $d=0.42$ and comparison group $d=0.75$ had significantly lower attention problems scores than the DEF group. No significant differences in attention between the ABC-T and comparison groups at postintervention $d=0.32$. Main effect for group on cognitive flexibility, $\eta^2 = 0.06$. ABC-T group performed
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Chapter 1

McCullough, et al., 2016 (4)	UK	Adoptees dyads n=31 children/young people	Age M= 14.68y (SD=3.14), 55% female, age placed with parents M=3.69y. History of ACE reported	No	Long treatment M=56.36 m (SD=34.29)	Neuro-Physiological Psychotherapy (NPP) - is a wrap-around multi-disciplinary, neuro-sequential, attachment-focussed intervention for children and families who present with emotional and behavioural difficulties. It integrates attachment and neuroscience research with sensory, somatic, play-based, attachment and trauma-focused therapy, and narrative life story work. It is underpinned by Dyadic Developmental Psychotherapy (DDP; Hughes, 2006). The aim of the programme is to enable the child to develop ways of managing highly dysregulated events by being helped by the parent to physiologically and emotionally regulate.	No details given	For the parent completed BRIEF: Behavioural Regulation Index, Inhibition and Emotional Control scales decreased significantly from pre to post-treatment. When scores in the 'normal' range pre-treatment were excluded from the analysis, scores for Global Executive Composite, Behavioural Regulation Index, Inhibit, Emotional Control, Working Memory and Monitor all significantly decreased. For the teacher-completed BRIEF scores for Global Executive Composite, Behavioural Regulation Index, Metacognition Index, Inhibit, Shift, Emotional Control, Initiate, Working Memory and Planning scales were significantly lower post-treatment compared to pre-treatment. When all scores were included in the analysis of the CBCL (parent-completed), Attention Problems scale did not significantly reduce. When 'normal' scores at assessment were excluded from analysis, decreases in scores for Attention	Not reported	significantly better than DEF d=0.40, but not significantly differently from the comparison group d=0.36. Behavioural Regulation index Cohen d=0.66, inhibition Cohen d=0.68, emotional control Cohen d=0.77. Scores above 65 only: Global Executive composite Cohen d=0.61, Behavioural Regulation Index d=1.07, Inhibition d=1.12, Emotional control d=1.26,
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Purvis, et al., 2015 (5)	USA	Adoptive parents (n=96), treatment group (n=48) and control group (n=48)	Age treatment group M= 7.88y (SD=2.06), 62.5% male, average age placed with parents 33.60 months (SD=31.76) History of ACE reported	Yes, online treatment group and a control group	no	Trust-Based Relational Intervention is a trauma-informed intervention grounded in attachment theory that seeks to improve outcomes for vulnerable children by helping caregivers understand the needs of children who have experienced relational trauma and helping them do what is necessary to meet those needs. It involves ecological, physiological, engagement, proactive strategies and responsive strategies, as well as mindful awareness. It is informed by the three pillars of trauma-informed care (Bath, 2008).	Group parent training on site. 6h per day for 4 days	Problems scales moved into significance. For the TRF (teacher-completed forms), scores for Attention Problems significantly decreased after treatment. When 'normal' scores at the pre-treatment phase were excluded from the analysis, the decrease in Attention Problems score neared this significance level.	Significant interaction effects for time and group, with hyperactivity/inattention problems (SDQ) being significantly lower at post-test for the treatment group, but did not change over time for the control group.	No attachment outcomes.	Working memory d=0.79, monitor d=0.71 Attention problems Cohen's d=0.41, only data in borderline or clinical Cohen d=1.90 Hyperactivity / Inattention scores. Time interaction (η^2) = .07 (.00) Group (η^2) = .02 (.00) Interaction (η^2) = 9.07 (.09)
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Chapter 1

Gurney-Smith et al., 2010 (6)	UK	Foster carers (n=5), adoptive parents (n=10) and a special guardian (n=1)	Ages 4 to 14 years old M=9 (SD=3), length of current placement M=50 months (SD=40.1)	No	3 month after	Fostering Attachments (Golding, 2006) is an intervention combining social learning theory and attachment theory to inform the parenting of LAC who present with emotional and behavioural difficulties. It promotes the understanding of early experiences, development and the child's attachment needs. It covers 3 modules: attachment theory, a model for parenting the child with attachment difficulties - providing a secure base and building relationships and managing behaviour.	Group based. 18 week 2.5hours weekly	Significant decrease in hyperactivity/inattention (SDQ) between pre-group and follow-up time points.	Significant increase in CRC (Child Responsiveness to Care) scale between pre and post group, pre group and follow up, post module one and post group. No significant changes on the subscale PCR (Parent-Child Relationship)	No effect sizes reported
Maki, 2002 (7)	USA	Adoptees dyads (n=43)	Ages 5-17 years old M=10.15 years old	No	No	Corrective Attachment therapy (from the Attachment Center at Evergreen) - Techniques used throughout this intensive period include cognitive restructuring, psychodrama, inner child metaphors, therapeutic holding as a nurturing process, and corrective attachment parenting or re-parenting.	Inpatient setting. 2 week intensive period, 30h broken into 3h per day for 10 consecutive days	Significant decrease in Attention problems (CBCL) post intervention and follow up.	No attachment outcomes.	No effect sizes reported
Staines, Golding and Selwyn, 2019 (8)	UK	Adoptive families (n=29)	Ages 18 months to 17 years, M=8 (SD=3.57), average age at adoption 52m	No	7-8 months later	Nurturing Attachments Programme is informed by DDP (Fostering Attachments was its precursor). It was developed to help foster and adoptive parents strengthen their relationships with their child and support children who had	Group based. 3 modules of 6 weekly sessions (18 total)	Slight increase of the Hyperactivity problems (SDQ) ratings post training.	No attachment outcomes.	No effect sizes reported

						experienced developmental traumas. The programme promotes understanding of child development and the impact of early trauma. Parents are enabled to develop skills to emotionally connect with children alongside providing empathic behavioural support. It aims to increase reflective functioning and parental self-efficacy.				
Colonnesei, et al., 2012 (9)	Netherlands	Adoptees dyads (n=20)	Ages 2 -5, M=45.6 months, (SD = 10), age at adoption M=20.95 months (SD=11.81), time with parents M=24.65 months (SD=14.12). Internationally adopted children	No	No	Basic Trust, an attachment-oriented intervention aimed at improving parental sensitivity and mind-mindedness, promoting parent-child relationships and reducing child psychopathology in families with adopted children. It is based on video feedback training at home, which aims to increase positive parenting skills. It uses psychoeducation on the attachment perspective	Video feedback home training with the family. 8 sessions over 3 months	Significant intervention, parents (mother and father's scores) and interaction effects for Hyperactivity subscale (SDQ).	Positive medium to large changes between pre and post-test were found in children's insecure attachments to their mothers and disorganised attachments to both their parents (AISI and Attachment Q-sort).	Hyperactivity mother-rated: Cohen's d=0.18. Hyperactivity father-rated: Cohen's d=0.20. Intervention (eta p2)= 0.01(.00) Parents (eta p2) =0.07 (.00) Interaction (eta p 2)=1.85 (.09)

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Golding & Picken, 2004 (10)	UK	Foster carers (n=13)	Ages 5-15 years old, all in long term placements (no specified length). History of ACE reported	Psychoeducational group. No comparison between	No	Fostering Attachments group began with a course explaining attachment theory and the development of attachment, the group was then encouraged to apply this theory to their understanding of their foster child's behaviour and emotions and doing changes to the way they foster/parent. It was based on attachment theory and social learning theory.	Group based. 18 x 2h sessions in 18 months. 4 week course introducing attachment, then monthly group meetings applying theory to practice	Significant decrease in the Hyperactivity problems subscale (SDQ) for the attachment group at post intervention measurement.	No attachment outcomes.	Hyperactivity effect size 0.66
Laybourne, Andersen & Sands, 2008 (11)	UK	Foster carers (n=10), completed treatment (n=8)	Not reported	No	No	Fostering Attachments Programme.	Group based. 18 weekly 3h group sessions for 6 months	No statistically significant differences between pre and post group scores, although there was a decrease noted in the Hyperactivity subscale (SDQ).	There were no statistically significant differences between pre and post scores on the RPQ	SDQ total scores (ηp2)=0.1
Becker-Weidman, A., 2008 (12)	USA	Foster children and adoptees dyads, treatment group (n=34), CAU group (n=30)	Ages 5-16 years, M=9.4 (SD=2.6), 71% male, age at adoption M=7, range 2-14.5 (SD3.8). History of ACE reported	Yes, treatments from other providers	M=1 year SD=0.6 follow up	Dyadic Developmental Psychotherapy (DDP; Hughes, 2003) is an approach to treating trauma-attachment disordered children that is based on attachment theory. It has as its core, or central therapeutic mechanism, the maintenance of a contingent collaborative and affectively attuned relationship between therapist and child, between caregiver and child, and between therapist and caregiver.	22 x 2 hours sessions over 11 months, involving therapist, parent(s) and child	Clinically and statistically significant decrease in the Attention problems subscale (CBCL) in the treatment group. No statistically significant difference between groups for Attention problems pre-treatment, but yes post-treatment. No statistically significant changes pre-test and follow up, all scores remained in the clinically significant range. Attention problems scores were significantly lower from post to follow-up for the treatment group.	Clinically significant results in the treatment group at posttreatment. Comparing pre-test scores with follow-up, none of the t-test were statistically significant and all the scores	No effect sizes reported

Wassall, S., 2011 (13)	UK	Adoptive parents and foster carers: treatment group (n=11), waiting list group (n=14)	Ages 0-15.5 years, M=8.31 (SD=4.67), 50% female, length in current placement M=5.01 (SD=3.9). History of ACE reported	Yes, waiting list, 6 months later receive the same intervention	8 months	Fostering Attachments Programme	Group based. 18 sessions x2'5h	There were no significant differences between the two groups for Hyperactivity scores (SDQ). There was a significant reduction on the Hyperactivity scores (SDQ) in the entire sample. For group 1 there were no significant differences between pre, post and follow up measurements.	remained in the clinically significant range. Comparing post scores with follow-up, RADQ scores were statistically significant for the treatment group. There were no statistically significant differences between groups on Child Sense of Security scores for the entire sample. Neither between the pre, post and follow up for the Group 1.	Cohen d=0.62 SDQ hyperactivity in group 1 pre-post, d=-0.06 for post to follow up and d=0.31 for pre to follow up. Cohen's d=0.37 for hyperactivity entire sample pre-post intervention.
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McCullough & Mathura, 2019 (14)	UK	Adoptees dyads (n=54), intervention group (n=22 sets of parents), control group (n=16 sets)	Ages M= 9.47 years (SD= 2.74), living with family M= 5.94y (SD3.44). History of ACE reported	Yes, no intervention	No	Neuro-Physiological Psychotherapy (NPP)	One therapist per child and set of parents. M=47 sessions	Statistically significant differences between groups for Global Executive Composite and Behavioural Regulation Index. Specific scores for the Attention problems subscale (CBCL) were not included.	Significant differences between groups on relationship quality (as per the parent interview).	Between group Behavioral Regulation Index: Cohen's d=.435; Global Executive Functioning Cohen's d=.147; and externalizing behavior (CBCL) Cohen's D=.025. Significant differences between the groups on relationship quality: Cramer's V=.444, disruption Cramer's V=.304.
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Note. TG = Treatment Group; CAU = Care As Usual, SDQ = Strengths and Difficulties Questionnaire (Goodman, 1999); CBCL = Child Behaviour Checklist (Achenbach & Rescorla, 2000); PRFQ = Parental Reflective Functioning Questionnaire (Luyten, et al., 2017); RFQ = Reflective Functioning Questionnaire (Fonagy et al., 2016)

1.4.2 Methodological approaches

There were three main types of study designs across the 14 studies: randomised controlled trials (1, 3 and 5), comparison between two (non-randomly allocated) groups with pre-post measures (10, 12, 13 and 14); and within-sample pre-post intervention design, including pilot and feasibility studies (2, 4, 6, 7, 8, 9, and 11).

1.4.3 Sample characteristics

Participants included foster carers (1, 2, 3, 10, and 11), adoptive families (4, 5, 7, 8, 9, and 14) and a mix of the two (6, 12 and 13). Lind et al., (2017) included foster carers and kinship carers in the sample. There were no other types of alternative care for children, such as kinship care or institutions. The length of time that children had been in the placement at start of treatment ranged between 12 weeks to 6 years.

The ages of the children ranged between 0 months old up to 17 years old. Three studies were done with families with toddlers (1, 3, and 9) and one had as average age teenagers (McCullough et al., 2016). The remainder of studies included samples of children with varying ages.

1.4.4 Intervention characteristics

All interventions had attachment or the parent-child relationship at the core of the intervention. Four of the studies evaluated the Fostering Attachments intervention (6, 10, 11 and 13) and its successor, Nurturing Attachments (Staines et al., 2019). Fostering Attachments (Golding, 2001) is an intervention combining social learning theory and attachment theory for

looked after children with attachment difficulties. Similarly to the NPP (4 and 14), Nurturing Attachments (8) is based on the ideas of Dyadic Developmental Psychotherapy (DDP; Hughes, 1997). DDP focuses on the development and maintenance of a collaborative and affectively attuned relationship between the child and caregiver, actively involving the therapist.

Two of the studies (2 and 9) used interventions based on the reflective parenting model and Nurturing Attachments (8) also introduces elements of it. The reflective parenting model suggests that a carer's capacity for parental reflective functioning or parental mentalizing (also called mind-mindedness) is important when managing behaviour and supporting emotional wellbeing of children in their care.

The rest of studies evaluated interventions that are based on the three pillars proposed by the ARC framework: (3) Attachment and Behavioural Catch-up (ABC; Dozier et al., 2006) and (5) Trust Based Relational Intervention. Fostering Changes (Briskman et al., 2012) resembles Fostering Attachments in that is based on social learning and attachment theories, and takes a skills-based approach. Maki's study (2003) was on Corrective Attachment Therapy, based on the Evergreen model (Stryker, 2010) which includes controversial techniques such as holding therapy (Barth et al., 2005). The theoretical bases of the interventions included in the review are illustrated in Figure 2.

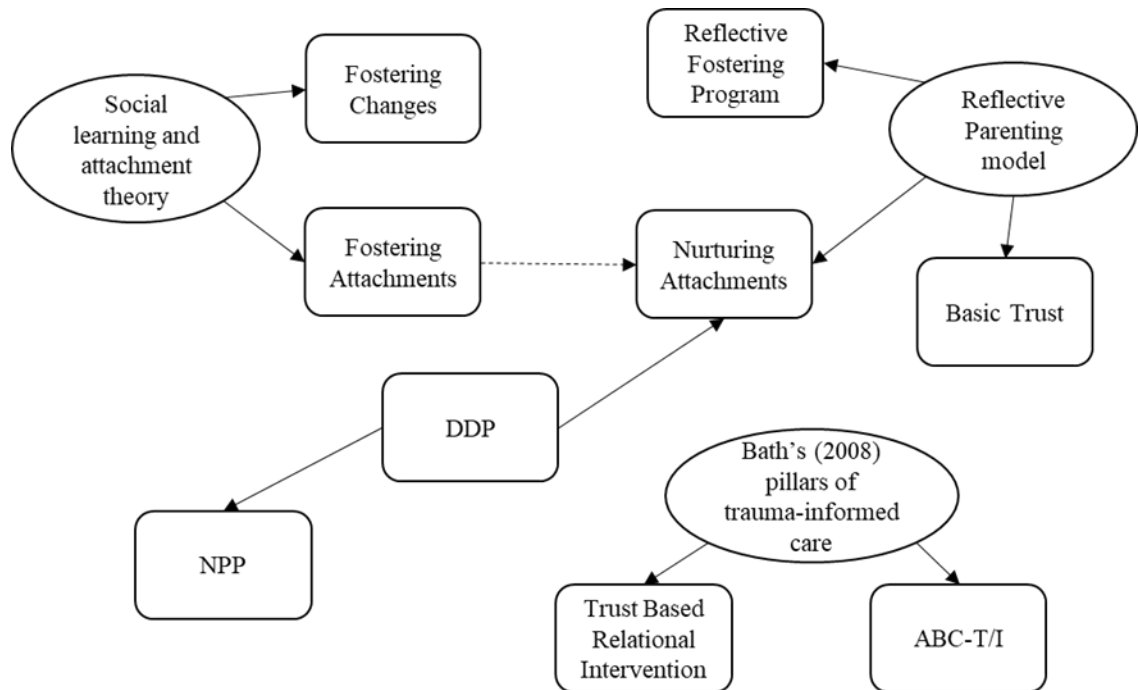


Figure 2 Illustration of the theoretical bases of the interventions

Eight of the studies delivered the intervention in a group format (see table 1), whilst the rest involved working individually with each family or dyad. Only Corrective Attachment Therapy (Maki, 2003) worked directly with the children only and in an inpatient setting.

The duration of the different interventions ranged between 8 to 47 sessions, and each session was in between 2 to 3 hours. With the exception of Trust Based Relational Intervention which had 6 hours sessions (Purvis et al., 2015).

1.4.5 Primary outcomes: Neurodevelopmental problems

All studies reported on ADHD symptoms, this was measured either by the of the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1999) – Hyperactivity subscale (1, 2, 5, 6, 8, 9, 10, 11, and 13); or the Child Behaviour Checklist (CBCL; Achenbach & Rescorla, 2000) Attention problems subscale (3, 4, 7, 12 and 14). Executive Functioning was measured in two studies (4 and 14) using the Behaviour Rating Inventory of Executive Function (BRIEF; Gioia et al., 2000) and cognitive flexibility (Lind et al., 2017) with the Dimensional Change Card Sort (DCCS; Carlson, 2005). No studies reported measurements of Autism Spectrum traits.

All but three studies, reported significant improvement in scores of Attention/Hyperactivity problems. Two studies (2 and 11) reported improvements, although not significant; and only one study reported a worsening of the symptoms following the intervention (Staines et al., 2019).

The two studies that measured EF with BRIEF, reported statistically significant improvements in EF following intervention (McCullough & Mathura, 2019), although in one of the two studies the effects were only significant after excluding the ‘normal’ range pre-scores from the analysis (McCullough et al., 2016). The only study that measured cognitive flexibility (Lind et al., 2017) reported that the intervention group performed significantly better at post-test, but there were no pre-scores available.

1.4.6 Secondary outcomes: attachment quality

Only four of the studies reported on attachment quality or related outcomes. Two of them reported no significant differences or changes (1 and 13). Positive changes were found from pre to post intervention in children’s insecure attachments to their mothers and disorganised attachments to both parents (9). (6) reported significant changes on Child Responsiveness to Care and the Parent Child Relationship subscales of the Intervention Carer Questionnaire (ICQ) created

by Golding and Picken (2004) at pre, post and follow-up. Independently from improvement or not in attachment, ADHD scores still improved on these four studies (1, 6, 9 and 13).

Two studies reported data on parental reflective functioning (2 and 8). The former reported no significant improvement in caregivers' reflective functioning after the intervention, and non-significant improvements on ADHD scores. The latter reported significantly higher PRF post intervention, however, a worsening on ADHD scores.

Other two studies (11 and 12) reported on attachment disorders scores. (11) reported non-significant changes pre-post on the Relationship Problems Questionnaire (RPQ, (Minnis et al., 2002) and non-significant improvement on ADHD scores. Clinically significant results in the treatment group at posttreatment were found on the Randolph Attachment Disorders Questionnaire (RADQ; Randolph, 2000) and scores were statistically significant for the treatment group between post and follow up (12). ADHD scores were also significantly lower from post treatment to follow up in the treatment group.

And (14) reported significant differences between groups on parent-child relationship quality as assessed by an interview, together with significant differences in between groups for both ADHD and EF scores.

1.4.7 Effect Sizes

Effect sizes were extracted according to subgrouping by ND problem measured (e.g., ADHD symptoms, EF, and autistic features) and study design (whether they had a group comparison).

For ADHD pre-post measures in treatment groups, effect sizes ranged between small (2 and 9), medium (11 and 13) and large (10). Some of them did not report effect sizes (6,7 and 8).

For ADHD post measures in between groups, there was only one study that reported a small effect size for group effect (5). Three of the studies with comparison group did not report effect sizes for differences between groups (1, 12 and 13).

Two studies measured both ADHD and EF problems, reporting medium effect sizes for both problems in pre-post comparison (3 and 4) and medium effect sizes for in between groups comparison (3). It is worth noting that Lind et al. (2017) measured only cognitive flexibility from the EF abilities. McCullough & Mathura, (2019) reported a small effect size in between groups on EF problems as reported on the Global Executive Composite score and the Behavioural Regulation Index.

1.4.8 Exploration of other potential moderators

1.4.8.1 *Theoretical approaches of intervention*

The interventions that were based on DDP (4, 12 and 14) and on Bath's (2008) model (3 and 5) reported improvements on ADHD and EF (3, 4 and 14). Only one of them measured attachment outcomes (12), which also improved from post-intervention to follow-up. The interventions based on the Reflective Parenting model (2 and 9) had mixed results, with one reporting improvements both in ADHD and attachment (9) and the other reporting non-significant results on both outcomes (2). The larger group of interventions, based on the social learning and attachment theories (Fostering Changes and Fostering Attachments), generally reported improvements on ADHD and attachment outcomes. Except for (13) who reported no changes pre-post or differences between groups on attachment, and (11) who reported non-significant changes on both outcomes. The study that sits in between DDP, RFP, and social learning and attachment theories (8) was also the one with the most complex results pattern. It showed improvements in RFP but worsening in ADHD symptoms post-intervention. The only study based on the Evergreen model (Stryker, 2010) reported improvements on ADHD symptoms.

1.4.8.2 *Ages*

In terms of ages, there were no differences between the different studies in relation to ADHD symptoms or attachment. This was difficult to assess as the majority of studies included wide ranges of ages.

1.4.8.3 *Type of care*

In samples of adoptive parents all outcomes were positive, except for (8) with a worsening in ADHD symptoms post intervention. In samples of foster carers results were mixed for ADHD scores and attachment outcomes, out of five studies, two (2 and 11) reported non-significant results on ADHD differences and three of them (1, 2, and 11) reported no differences on attachment outcomes. For the mixed samples, they all had significant ADHD differences, and only one of them (13) reported a non-significant difference between groups and pre-post on attachment outcomes.

Study design

The study designs did not relate to differences in both ND and attachment outcomes, all three categories of designs mentioned before had a mix of significant and non-significant results.

1.5 **Discussion**

Overall, this systematic review of the literature demonstrated that there is still not much research in this area. There were a few pilot and evaluation studies and only three randomised controlled trials. As measured by the Downs & Black (1998) checklist, the quality of the studies was, on average, of a fair quality. Additionally, the diverse studies, interventions, and sample

characteristics, make it difficult to answer the primary question posed in this review. Results indicate that, generally, there seems to be an improvement in Neurodevelopmental problems following an Attachment-based intervention; however, due to the study designs, it is difficult to establish if these changes are due solely to the intervention and not for instance, time. One reason for the scarcity of studies in this area is that, it may be difficult to conduct RCTs on this population, as such trials with children with such severe and enduring difficulties, and when placements can be at risk of breakdown, pose ethical challenges. Nonetheless, studies that explore the impact of Attachment-based interventions on the difficulties of children in care are of paramount importance. As Golding and Picken (2004) stated, quasi-experimental research has the potential to provide effective pointers to areas that can be fruitfully researched. Additionally, practice-based evidence is often all there is to follow until a researched evidence base with the same population is available. Publication bias was reduced by including dissertations in the search.

All studies but one reported improvements in ADHD scores post-test, although in two studies the improvements were not significant (Laybourne et al., 2008; Midgley et al., 2019). Only one study reported a worsening of ADHD symptoms following the Nurturing Attachments intervention (Staines et al., 2019). The authors hypothesised as possible reasons for the worsening: that as children grew older, their difficulties could become more pronounced; or that changes in parenting style caused some of the children to be unsettled by the change and thus their behaviour deteriorated; or that improvements in parental self-efficacy and reflective functioning influenced their perceptions of behaviour as more severe. The results from the studies that report a positive effect are consistent with previous studies which reported either attachment problems were associated with increased risk for ADHD (Storebø et al., 2016) or secure attachment with less attention problems and less hyperactivity (Abrines et al., 2012) in adoptees.

The three studies that measured Executive Functioning problems, all had significant improvements post-treatment (Lind et al., 2017; McCullough et al., 2016; McCullough & Mathura, 2019). This is consistent with findings from previous studies that linked attachment and EF among children experiencing adversity and suggest that prevention or intervention supporting the development of secure attachments may also foster EF development (Menon et al., 2020).

Due to the heterogeneity of the studies' designs (e.g., randomized trials and pre-post single arm evaluations), outcome measures used (numerous different attachment measures), and populations (adopted children, fostered children), it was not possible to conduct a thorough analysis to check whether changes in attachment mediate improvements on neurodevelopmental problems and so answer the secondary research question. This was qualitatively reported instead: generally, in the studies where attachment related outcomes were reported, where there were significant differences on attachment, so were on ND outcomes. The opposite was also true, when there were no differences or non-significant differences on attachment outcomes, there were no differences on ND outcomes too. The exception were two studies, one where despite no changes on attachment outcomes there was an improvement on ADHD scores (13), and another where there was an improvement in parental reflective functioning but a worsening on ADHD symptoms (8) as explained before. It could be argued that changes in the attachment relationship between the caregiver and the child could be related to changes on ND outcomes. Although conclusions need to be taken with caution as designs and samples changed across the studies. Additionally, it is possible that when parents improve their relationship with the children may see their difficulties as less of a problem.

In terms of other potential moderators, such as theoretical background of the intervention, ages and study designs, results were mixed and no meaningful conclusions could be made. Regarding type of care, it seems that in samples of foster carers results were mixed in both attachment and ADHD outcomes; whilst in adoptive parents samples the interventions improved attachment outcomes and all studies but one reported a significant positive difference on ADHD scores. Studies which directly targeted academic or cognitive outcomes were not excluded. This could have some implications as they would have likely had an effect on neurodevelopmental outcomes. Nevertheless, no studies that targeted cognitive outcomes these were found.

Interestingly, no studies that measured Autism traits were found in this systematic review. There was one study that did report on cognitive flexibility and Theory of Mind outcomes in foster children who received the ABC intervention (Lewis-Morrarty et al., 2012). However, the study only measured Theory of Mind outcomes post-intervention, comparing in between the group that received ABC and a non-foster children comparison group; and therefore, it was impossible to establish a change due to the intervention as there were no pre-measurements. As it did not meet the criteria of having pre and post measures, this was also the reason why it was screened and not included in the review. A possible explanation for the dearth of studies measuring this neurodevelopmental outcome, is that Autism traits have only been found in very specific populations, children with very severe histories of maltreatment, severe deprivation, and institutionalisation (Dinkler et al., 2017; Kočovská et al., 2012; Kreppner et al., 2010). Additionally, the evidence points more at the increased chances of maltreatment for children who have an Autism Spectrum condition rather than maltreatment being a cause for increased traits or clinical characteristics (Kerns et al., 2015). Furthermore, there is an overlap of ASD with Attachment disorders, which makes them sometimes difficult to differentiate (McKenzie & Dallos, 2017; Minnis et al., 2020).

It was also surprising not to have any studies with other well recognised attachment-based interventions such as the PCIT (Eyberg et al., 1995). Considering how many studies were missed in the database searching (six published papers and one dissertation) that were later found through the backward and forward citation; this could be explained by a limitation in the search strategy. Looking at the papers selected from the snowballing technique, they were missing keywords related to either ND outcomes, attachment or the fact that children were in care on their title or abstract.

Ultimately, it is evident that a good quality caregiver-child relationship where the child feels secure and safe, will help alleviate at least some of the negative effects of their early histories of maltreatment (Audet & Le Mare, 2010; Colonnese et al., 2012; Laucht et al., 2001; Purvis et al., 2015). Moreover, it may also help prevent placement breakdown. It is well recognised that caring for traumatised children requires extra support and training for the parents. Feedback from the group members of some of the interventions included in this review reported feeling supported through attending the groups and that this increased their confidence and ability to cope with the children (Golding & Picken, 2004).

1.5.1 Limitations

Conclusions from this review should be taken with caution, as many studies without a control group were included. Therefore, it is not possible to ascertain that changes in neurodevelopmental problems scores were solely due to the attachment-based interventions. Additionally, without a randomized controlled trial there is always a risk of selection bias. Other limitations at study level are that most measures used in the selected studies were caregiver-

reported and therefore subject to respondent bias; and that the samples were generally small with no reference to power in most of the studies.

1.5.2 Conclusions, Clinical Implications and Future Research

Albeit the limitations of this review and the need for further good quality research in this area, it could be concluded that it may be possible that Attachment-based interventions could help improve neurodevelopmental outcomes in children in care with histories of maltreatment; particularly, ADHD and EF. Clinical implications include that, perhaps, these interventions may be a way forward in treating some of the problems that result from early adverse experiences in children in care. Current guidelines (National Institute for Health and Care Excellence, 2015) exist for looked-after children with attachment difficulties, however, the treatments indicated have evidence base only for the 'normal' population and not for children in care. Indubitably, studies with stronger designs, such as RCTs, are need in order to confirm these conclusions.

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Chapter 2 Parent-Child relationship quality as a potential moderator between child maltreatment and neurodevelopmental problems in adoptees

Intent to publish in Journal:

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All manuscripts must be provided in MSWord format in 12-point type with 1-in. margins on all sides. The entire manuscript must be double-spaced and numbered consecutively. The language of publication is English. Follow the general style guidelines set forth in the *Publication Manual of the American Psychological Association* (6th ed.).

2.1 Abstract

Childhood maltreatment experiences have been associated with neurodevelopmental (ND) outcomes, in particular Attention Deficit and Hyperactivity Disorder (ADHD) and Autism traits. A secure attachment relationship has also been associated with positive ND outcomes. The aims of this study were to enhance current understanding on how child maltreatment is related to ND problems and how the quality of the adoptive parent-child relationship may influence this association. Data from a sample of 94 children 6 to 11 years old, 26 of them adoptees with a history of maltreatment and 68 biological children without history of maltreatment, was analysed to explore the relationship between maltreatment and ND outcomes. A moderation analysis was run to see whether parent-child closeness had an influence on that association. Results indicated that children with a history of maltreatment (adoptees) had significantly higher scores on inattention and hyperactivity. The odds ratio of screening positive in autism on a screening questionnaire indicated that adoptees were three times more likely to meet criteria for further autism assessment. The moderation analysis was not significant.

Findings go in line with previous research, where child maltreatment has been associated with ND outcomes. However, despite previous evidence indicating that the attachment relationship may influence the ND problems (particularly ADHD) in children in care, our hypothesis of this relationship being a potential protective factor or moderator was not confirmed. There were significant power issues due to the small sample of adoptees.

Key words: Attachment, Neurodevelopmental symptoms, Child Maltreatment, Children in Care, Adoptees, Attention Deficit and Hyperactivity Disorder, ADHD, Autism, ASD, moderating factors

2.2 Introduction

The number of looked after children (LAC) increases each year in the United Kingdom (Department for Education, 2020). A recent report by the Department for Education (2020), states that there were 80,080 looked after children on the 31st of March 2020, 2% more than the previous year. Of these, 3,440 were adopted during the year. The main reasons for being looked after were: maltreatment (63%) and family dysfunction (15%) (Department for Education, 2020). Maltreatment generally includes neglect and abuse (sexual, emotional, and physical). In addition to the potential trauma from the maltreatment they have suffered, children in care also suffer an attachment disruption as they leave their birth family and enter into care (González et al., 2019). These experiences have been associated with neurodevelopmental (ND) outcomes, including Attention Deficit and Hyperactivity Disorder (ADHD) (Kavanaugh et al., 2017) and Autism Spectrum Disorder (ASD) traits (Rutter et al., 1999). It has been suggested that these difficulties emerge as a result of brain alterations caused by traumatic experiences of maltreatment and attachment disruption (Creeden, 2004).

2.2.1 Maltreatment and Neurodevelopmental Outcomes

De Bellis (2001) proposed, within a developmental traumatology framework, that a stressor such as childhood trauma activates the stress response systems for harmful prolonged periods of time. This response can cause a shift to occur from process of brain development and growth, to survival and preservation (De Bellis & Zisk, 2014). This, in result, causes deficits in higher order brain functions (De Bellis, 2001).

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Attention and executive functioning deficits are one of the most frequently studied neurodevelopmental problems following childhood maltreatment (Kavanaugh et al., 2017) although the possibility of reverse causality is also an option (Lugo-Candelas et al., 2020). A longitudinal study found robust associations between early maltreatment and ADHD (González et al., 2019), with different categories of maltreatment increasing the likelihood of ADHD for girls and boys. Another longitudinal study found strong associations between childhood maltreatment and ADHD (Stern et al., 2018). Retrospective studies done with adults have also reported an association between childhood maltreatment and ADHD symptomatology in adulthood (Capusan et al., 2016; Fuller-Thomson & Lewis, 2015).

Specific neurodevelopmental differences have been linked with experiences of childhood maltreatment, such as changes in the amygdala function, which, in turn, are associated with increased attention to threat-stimuli (Sheridan & McLaughlin, 2014). Accordingly, these neurodevelopmental differences resulting from early childhood maltreatment may play a role in the development of ADHD (Clayton et al., 2018). Additionally, at a behavioural level, PTSD symptoms of hyperarousal and hypervigilance may overlap with, or confound, the inattention and hyperactivity symptoms of ADHD (Spencer et al., 2016). In other research, a child's trauma and attachment history has been linked to the development and functioning of the prefrontal cortex, the area of the brain highly involved in executive functioning skills (Creeden, 2009). Executive function deficits and alteration in the prefrontal cortex have also been implicated in ADHD (Antshel et al., 2014). It is worth noting, however, that the evidence has demonstrated effects in both directions. For instance, Dinkler et al., (2017) found only a small effect of child maltreatment on ADHD symptoms and the majority was explained by genetic risk. Other studies have also shown that children with ADHD have a higher risk for experiencing adversity (Lugo-Candelas et al., 2020).

Evidence from the English and Romanian Adoptees study (ERA) demonstrate that extended early severe institutional deprivation is associated with long-term negative outcomes across a range of neurodevelopmental domains (Sonuga-Barke, et al., 2017). In particular, the ERA team found three deprivation-specific, neurodevelopmental problems which emerged early in childhood: quasi-autism, disinhibited social engagement (formerly labelled disinhibited attachment) and inattention/overactivity (Kreppner et al., 2007; Rutter et al., 2001). A significant percentage of these children showed autistic-like patterns of behaviour and mild autistic features (Rutter et al., 1999; Rutter et al., 2001).

A lot of the existing evidence on childhood adversity and ND problems has come from the studies on institutionalised Romanian children; and in particular from two influential studies in the field, the longitudinal English and Romanian Adoptees study (ERA; Sonuga Barke et al., 2017) and the Bucharest Early Intervention Project (BEIP; Ghera et al., 2009). There is not as much evidence coming from more common populations, such as adopted children who were removed due to child maltreatment or neglect.

2.2.2 Attachment and ND Outcomes

Relationship experiences, particularly the quality of the caregiver-child relationship, have been proposed to be a critical context for development (Sroufe, 2000) shaping neurological, psychological and social development (Newman et al., 2015). During infancy, the influence of relationship experiences with important caregivers is particularly influential as infants rely on their caregivers for survival (World Health Organization, 2004). Accordingly, significant disruptions or deviations from normative caregiving experiences during this early developmental period are

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considered high risk for subsequent development (Newman et al., 2015). Children who are adopted following maltreatment experiences are thus at particular risk.

In some studies, adopted children with a secure attachment to their adoptive parents showed less attention problems than adoptees with an insecure attachment, and a trend to the same tendency could be observed for hyperactivity (Abrines et al., 2012). Studies with the general population have linked the emergence and severity of ADHD-like symptoms to the absence of parental skills that are vital in promoting a secure attachment with their children (Pinto et al., 2006).

In intervention studies, sensitive parenting has been observed to predict improved performance on executive functioning (Lind et al., 2017); and a high quality caregiver-child relationship, such as a secure attachment dyad, has been shown to buffer against the harmful effects of maltreatment and neglect (Colonnesi et al., 2012; Purvis et al., 2015). While there has been substantial research that has documented links between abuse and later negative adjustment, there has been far less research that has addressed important mediators and moderators in this relationship (Wright, 2007). When children are faced with specific risks, parent-child relationships frequently serve as assets, moderators, and mediators (Sroufe et al., 2000). Therefore, attachment may be an important mediating or moderating variable in the association between experiences of child maltreatment and ND problems. An aim of this study was to explore this.

2.2.3 Aim

The aim of this study was to explore whether neurodevelopmental problems were elevated in a sample of children adopted from maltreating families compared to a non-maltreated group of similarly aged children raised by their biological parents. The study further explored the role of the parent-child relationship in moderating any effects of maltreatment on

neurodevelopmental problems (see Figure 1). Accordingly, the primary research questions was: Does childhood maltreatment predict neurodevelopmental problems in adoptees?

The secondary research question was: Does parent-child relationship closeness moderate the relationship between child maltreatment and neurodevelopmental problems?

The hypotheses posed were: (1) Children with a history of maltreatment (adoptee group) will show more neurodevelopmental problems, compared to children in the comparison group (biological children) without a history of maltreatment. (2) Greater levels of maltreatment will predict higher levels of neurodevelopmental symptoms in adoptees (ADHD symptoms and ASD traits). (3) Parent-child relationship closeness will moderate the relationship between maltreatment and ND problems, expecting it will buffer or protect against the risks early maltreatment has on ND outcomes. The following figure illustrates these predictions:

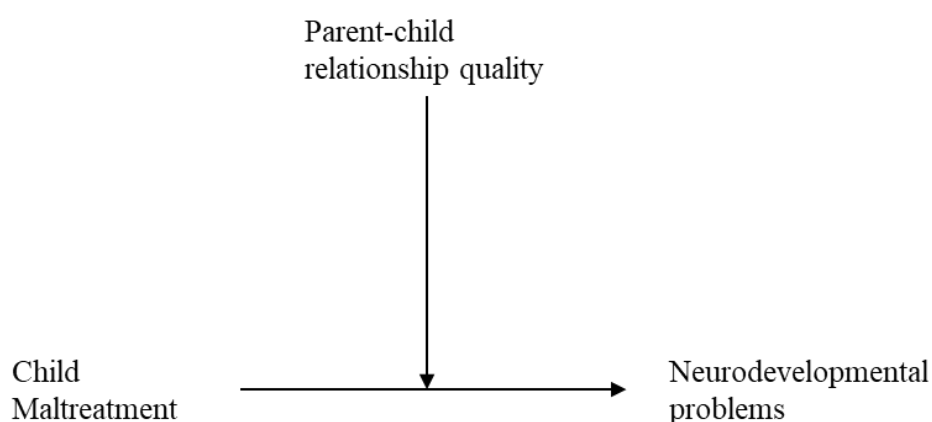


Figure 3 Hypothesised model

2.3 Methods

2.3.1 Design

This study is part of a larger project conducted by the University of Southampton in partnership with Adopt South (regional adoption agency), exploring the benefits of adoption on child development. The study is cross-sectional as adopted children's development is compared with that of a non-adopted, typically developing comparison group. Included adoptees had experienced some form of maltreatment. The predictor or naturally occurring independent variable was childhood maltreatment, including both neglect and abuse (sexual, emotional and physical). The outcome variable was neurodevelopmental problems: ADHD and ASD screening. Closeness in the parent-child relationship scale was measured as a potential moderator of this relationship (see Figure 4).

2.3.2 Participants

A total of 112 participants were recruited online. Only participants with complete data for the questionnaires relevant for this study were included in the analysis. Inclusion and exclusion criteria were applied: children aged younger than 6 or older than 12 were excluded, and data of biological children who had history of maltreatment or adoptees without history of maltreatment were also excluded. The final sample consisted of 94 participants, 26 adoptees (age $M = 8.81$ years, $SD = 1.87$) and 68 biological children (age $M = 8.33$, $SD = 1.70$). There were 11 males and 15 females in the adoptees group, and 37 males and 30 females in the biological group. Data on child's gender was missing for one participant from the biological children group. There were no significant differences between the two groups in regard to age and gender according to the χ^2 and t-test analyses. Further details of the sample characteristics are presented in Table 1. Adoptees' age at placement ranged between 6 months to 7.5 years old ($M = 3.00$, $SD = 2.11$).

Table 2 Sample Characteristics***Sample Characteristics***

	Adoptees (n= 26)		Biological (n= 68)		Total (n= 94)	
	Mean	SD	Mean	SD	Mean	SD
Child's age	8.81	1.87	8.33	1.70	8.47	1.76
Parent's age	46.23	5.74	39.61	5.70	41.45	6.41
Age at placement	3.00	2.11				
	N	%	N	%	N	%
Child's gender	Male (n=11)	Male 42.3%	Male (n=37)	Male 55.2%	Male (n=48)	Male 51.6%
	Female (n=15)	Female 57.7%	Female (n=30)	Female 44.8%	Female (n=45)	Female 48.4%
Parent's gender	Male (n=6)	Male 23.1%	Male (n=5)	Male 7.4%	Male (n=11)	Male 11.7%
	Female (n=20)	Female 76.9%	Female (n=63)	Female 92.6%	Female (n=83)	Female 88.3%

2.3.3 Procedure

The study received ethical approval from the Ethics Committee of the University of Southampton (ERGO IDs: 54009 and 55675).

Recruitment was done through publishing an advert on social media, and sent to relevant organisations (adoption services), schools and parents' groups. Data was collected from two studies within the same wider project. The first study (pilot) consisted of an online survey. Following amendments in part driven by COVID-19 restrictions, on the second part of the study, people were invited to do an amended version of the online survey and a videoconference assessment session with the child. Only data from the surveys was used for this study. The survey

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took approximately 45 minutes to complete. Parents provided informed online consent to participate in the study.

2.3.4 Measures

A battery of measures was used by the wider project, below the measures relevant for this particular study are described.

2.3.4.1 Demographics

Children's ages and gender, age at placement (of the adoptees), and data on parental age, gender, occupation, level of education and family income (SES) were taken.

2.3.4.2 Child Maltreatment

2.3.4.2.1 Adapted ACE-Q Child (Centre for Youth Wellness, 2015)

This 17-item questionnaire is completed by the caregiver and it calculates the cumulative exposure to adverse childhood experiences in children. It is scored as yes or no (1 or 0) for ten items assessing exposure to the original 10 intrafamilial adverse childhood experiences (Felitti et al., 1998), including the three domains of abuse, neglect and family dysfunction; and a further 7 items assessing for exposure to additional early life stressors. This measure is currently in the process of clinical validation (Purewal et al., 2016). This questionnaire was used in the pilot phase (n=52).

2.3.4.2.2 Yale-Vermont Adversity in Childhood Scale (Y-VACS; Holbrook et al., 2015)

The Y-VACS is a parent reported 20-item scale that covers both frequency and severity of different experiences of adversity, including two subscales: extra-familial (natural disasters, community, health-related) and intrafamilial experiences. It has established psychometric properties, with concurrent validity supported by associations between the Y-VACS and alternative measures of adversities and maltreatment (Holbrook et al., 2015), and it has predictive

validity. The intrafamilial subscale had a Chronbach $\alpha = 0.88$ in our sample. The Y-VACS was used in the amended version of the survey (n=42).

2.3.4.3 Children's Neurodevelopmental Problems

2.3.4.3.1 Swanson, Nolan and Pelham IV scale – Parent Form (SNAP-IV; Swanson, 1992)

This is a parent-completed 26-item scale based on the DSM IV symptoms for the inattention (IA, Items 1-9), hyperactivity/impulsivity (HI, items 10-18) criteria for ADHD; and oppositional symptoms (OP, items 19-26) of the criteria for oppositional defiant disorder (ODD). Each item is rated on a four-point rating scale, from 0 not at all to 3 very much. The SNAP-IV has acceptable reliability of the parent and teacher versions and the parent version satisfactorily distinguished by diagnostic status of ADHD (Bussing et al., 2008). It also has demonstrated high internal consistency (all $\alpha \geq 0.88$) for the three subscales (Gau et al., 2008) and is highly correlated with the corresponding subscales of the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1999) and Child Behaviour Checklist (CBCL; Achenbach & Rescorla, 2000).

For autism, two measures were used across the different versions of surveys:

2.3.4.3.2 Social Communication Questionnaire - 15 Item version (SCQ-15; Sonuga-Barke et al., 2017)

This version is based on the original SCQ (Rutter et al., 2003) with five items for each scale: social reciprocal interaction, communication, and repetitive and stereotyped behaviours. A symptom domain is deemed endorsed if at least three items were rated 1 (0–1 scale). The SCQ-15 is a screening tool, indicating when further autism assessment might be helpful, and it is not a diagnostic measure. This questionnaire was used in the pilot phase (n=52).

2.3.4.3.3 Autism Spectrum Quotient – Child version (AQ-10; Allison et al., 2012)

This questionnaire is a 10-item screening tool for Autism Spectrum Disorders recommended by the NICE guidelines (National Institute for Health and Care Excellence, 2016). It was used in the amended version of the survey (n=42). It is parent-reported for children between 4 and 11 years old. The child version's sensitivity is 0.95 and specificity 0.89, with an internal consistency of >0.85, excellent validity AUC > 0.90 and a Cronbach's alpha of 0.90 (Allison et al., 2012).

2.3.4.4 Parent Child Relationship

As there are no validated attachment questionnaires available for the age range of the population of this study, the decision was made to include a measure that is based on other well-known attachment measures and cover similar constructs to attachment, in this case closeness.

2.3.4.4.1 Child-Parent Relationship Scale (CPRS; (Driscoll & Pianta, 2011)

This scale is a self-report instrument completed by the parent that assesses their perception of their relationship with their child. It has 30 items rated on a 5-point Likert scale and they can be summed into the subscales: conflict and closeness. The items were based on attachment theory and the Attachment Q-sort (Waters & Deane, 1985). The closeness scale measures warmth, affection and open communication, and the conflict subscale measures parents' perceptions of a negative and conflictual relationship. Correlation between closeness ratings and observer ratings in structured interactions are highest for supportive presence, sensitivity and positive caregiving (Driscoll & Pianta, 2011). High reliability has been reported for different versions of the CPRS, ranging from 0.71 to 0.73 in the closeness scale and 0.71 to 0.85 on the conflict scale (Ulutas & Kanak, 2016; Zhang & Chen, 2010).

2.3.5 Data Analysis

Data analysis was conducted using SPSS version 25 (IBM, 2017) and PROCESS (Hayes, 2017). To test the first hypothesis, between groups mean comparison tests were conducted between the adoptees sample and the biological children sample. To test the second hypothesis, linear simple regression and binary logistic regressions were carried out. In order to answer the secondary question, a moderation analysis was conducted with parent-child closeness as moderator, child maltreatment as predictor and inattention, hyperactivity and autism screening as outcomes.

The normality assumption was met for the data on inattention and hyperactivity/impulsivity as measured by the SNAP-IV within the adopted group but were skewed towards lower scores for the biological group. To account for that, bias corrected bootstrapped 95% confidence intervals (1000 bootstraps) are reported. For the rest of the variables where normality or normal distribution of residuals assumptions were not met, non-parametric alternatives were used, for instance, ASD screening.

In order to combine the data on maltreatment and ASD across the two surveys, both parameters were dichotomised in the following way: for maltreatment, the group of adoptees was classified as having suffered maltreatment, and the biological children as not maltreated. Some analyses were run with the continuous YVACS intrafamilial subscale, albeit only data for 15 adoptees was available. The data from the SCQ-15 and AQ-10 was dichotomised scoring 1 if the scores were above each measures' established threshold for further autism assessment, and 0 if they did not.

2.4 Results

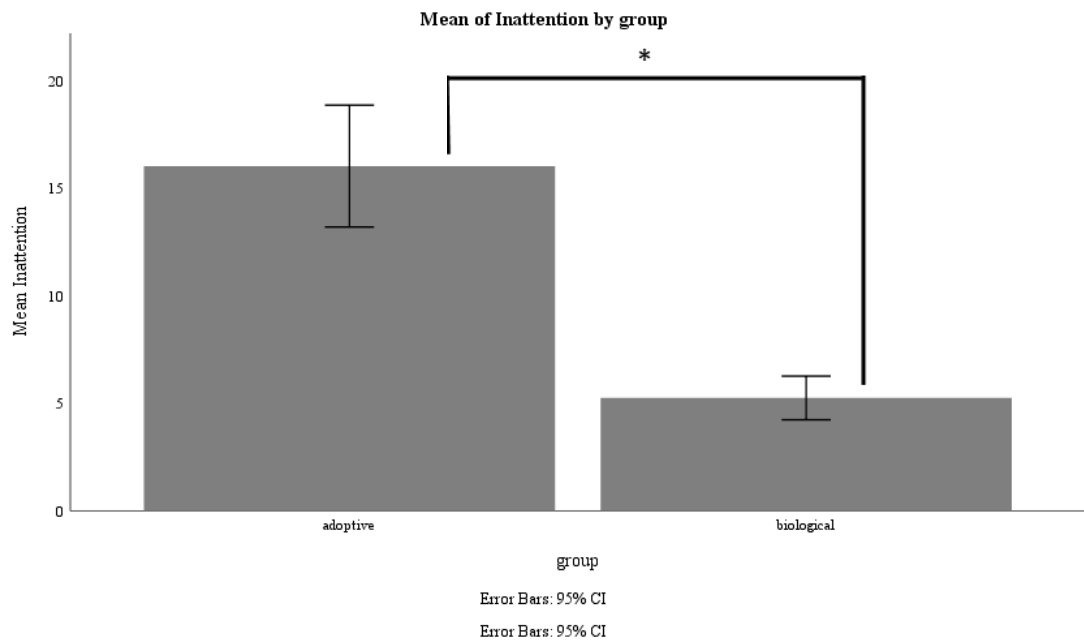
Hypothesis 1 Children with a history of maltreatment (adoptive group) will show more neurodevelopmental problems, compared to children in the comparison group (biological children) without a history of maltreatment.

There were 26 adoptees who suffered maltreatment and 68 biological children with no history of maltreatment. An independent-samples t-test was run to determine if there were differences in the SNAP inattention and hyperactivity scores between the two groups of adopted and the biological children. The assumption of homogeneity of variances was violated, as assessed by Levene's test for equality of variances ($p \leq .001$). The adoptees group had higher scores on the inattention subscale ($M = 16.04$, $SD = 7.02$) than biological children ($M = 5.25$, $SD = 4.19$), and on the hyperactivity subscale ($M = 15.12$, $SD = 7.49$) than the comparison group ($M = 4.71$, $SD = 4.03$). There was a statistically significant difference between the two groups on both the inattention scale and the hyperactivity scale and the effect sizes for the group differences were large for both (Cohen's $d = 1.87$, and 1.66 , respectively, (see Table 3).

Table 3 Differences between groups on Inattention and Hyperactivity/Impulsivity

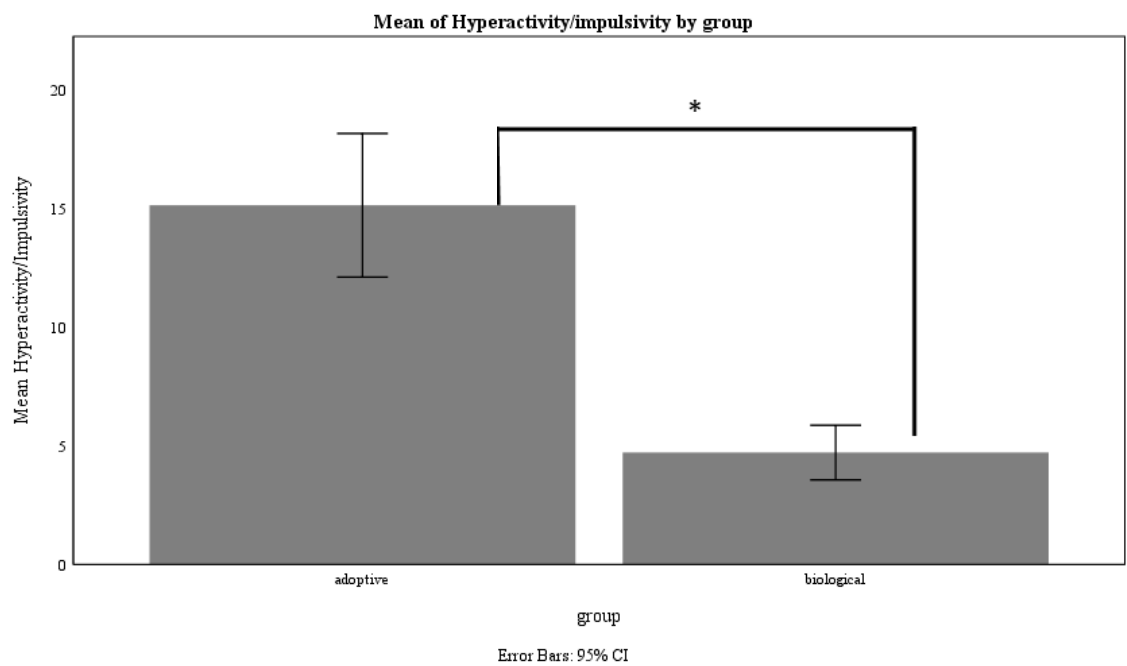
Independent Samples t-test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% bias corrected confidence interval of the Difference	
									Lower	Upper
Inattention	Equal variances not assumed	15.07	.00	-7.35	32.06	.00	-10.79	1.47	-13.78	-7.80
Hyperactivity/ Impulsivity	Equal variances not assumed	6.53	.01	-6.60	32.98	.00	-10.41	1.58	-13.62	-7.20



Note. (Significance $* < .05$)

Figure 4 Differences between adoptees and biological children on inattention



Note. (Significance $* < .05$)

Figure 5 Differences between adoptees and biological children on hyperactivity/impulsivity

To test whether adoptees were more likely to be above threshold on the autism questionnaires compared to biological children, a chi-square test was conducted. Data for ninety-four children was included, consisting of 26 adoptees and 68 biological children. There were 7 adoptees and 7 biological children who met criteria for further autism assessment as indicated by the screening questionnaires.

All expected cell frequencies were greater than five. There was a statistically significant association between group and being above threshold for autism screening, $\chi^2(1) = 4.103, p = .043$. The corresponding association as measured with phi, was of small but significant magnitude, $\phi = -0.209, p = .043$.

The odds of meeting criteria for further autism assessment in adoptees was 0.37 whilst in biological children was 0.11. The odds ratio of meeting criteria for further autism assessment in adoptees versus biological children is 3.36. This means that adoptees were three times more likely to meet criteria for further autism assessment.

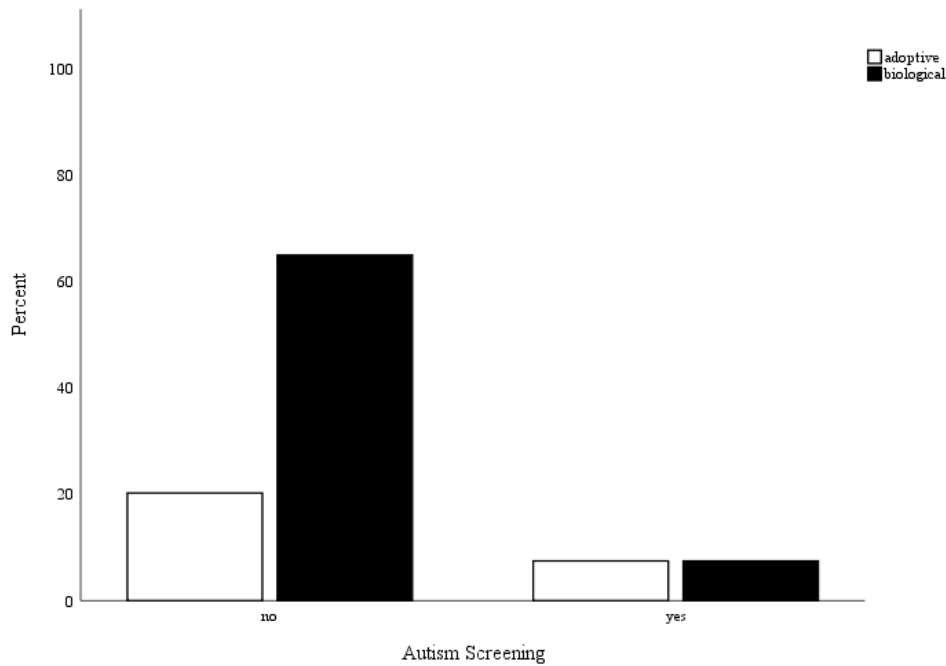


Figure 6 Differences between adoptees and biological children on autism screening results

Hypothesis 2: Greater levels of maltreatment will predict higher levels of neurodevelopmental symptoms in adoptees (ADHD symptoms and ASD traits).

Data on severity of maltreatment was only available for 15 adoptees, as it was only measured by the YVACS (intrafamilial subscale) in the second version of the survey. A scatterplot of the severity of maltreatment as measured by the YVACS scores against the SNAP inattention and hyperactivity/impulsivity subscales was plotted. Visual inspection of these scatterplots indicated that there was not a linear relationship between the variables. Additionally, the data was not normally distributed. Therefore, a Spearman's Rho correlation was run instead.

There was no correlation between the YVACS scores and the inattention and hyperactivity scores in adoptees, $r_s = .197$ and $r_s = .128$ respectively.

A binomial logistic regression was performed to ascertain the effects of maltreatment on the likelihood that children would score above the threshold on an autism screening measure. Only data of 15 participants was included in the analysis. Linearity of the continuous variables with respect to the logit of the dependent variable was assessed via the Box-Tidwell (1962)

procedure. Based on this assessment, all continuous independent variables were found to be linearly related to the logit of the dependent variable. There were no standardized residuals with a value over 2.5. The logistic regression model was not statistically significant, $\chi^2(1) = 1.52, p = 0.218$, indicating that the model did not fit.

Therefore, an exploratory follow up t-test analysis was run. As YVACS data was skewed, bias corrected bootstrapped 95% confidence intervals (1000 bootstraps) are reported. The group of children who scored above the threshold for further ASD assessment had higher scores on the YVACS intrafamilial subscale ($M = 22.29, SD = 9.84$) than the children below the screening threshold ($M = 16.38, SD = 9.32$), but the difference did not reach statistical significance. ($M_{\text{Difference}} = 5.91, 95\% \text{ CI } [-4.78, 16.61], t(13) = 1.19, p = .254$). However, when the effect size was calculated, it showed a moderate effect size of 0.615. This could indicate that the non-significant results were due to lack of power in light of the small number of participants included in the analysis.

Hypothesis 3: Parent-child relationship closeness will moderate the relationship between maltreatment and ND problems

To investigate the effect of parent-child relationship quality, in particular closeness, on the neurodevelopmental effects of maltreatment, a series of simple moderator analyses were performed using PROCESS. The outcome variables for analysis were inattention, hyperactivity/impulsivity and ASD screening. The predictor variable for the analysis was experiences of maltreatment, as a dichotomised variable (adopted vs biological child). The moderator variable was the CPRS closeness subscale. For autism screening and closeness, the overall model was not significant ($B = 0.033, 95\% \text{ CI } (-0.167, 0.233), p = 0.745$).

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The moderation models for both inattention and hyperactivity/impulsivity were significant (see Table 4). In both models, group status was a significant predictor of inattention and hyperactivity/impulsivity, but closeness in the parent-child relationship was not significant. The interaction term was also not significant in either model (see Table 5).

Table 4 Moderation Analyses Model Summaries

Model Summaries

Model Summary Inattention						
p	R	R-sq	MSE	F (HC3)	df1	df2
.000	.725	.526	24.219	19.079	3.00	90.00

Model Summary Hyperactivity/Impulsivity						
p	R	R-sq	MSE	F (HC3)	df1	df2
.000	.645	.416	32.083	14.183	3.00	90.00

Model Summary Autism						
-2LL	ModelLL	df	p	McFadden	CoxSnell	Nagelkrk
74.985	4.137	3.000	.247	.052	.043	.076

Table 5 Moderation Analyses Models

Models

Model Inattention						
	coeff	se (HC3)	t	p	LLCI	ULCI
constant	16.039	1.409	11.385	.000	13.240	18.838

Group	-10.789	1.497	-7.206	.000	-13.764	-7.815
CPRS closeness	-.353	.279	-1.265	.209	-.908	.202
Group x closeness	.113	.318	.354	.724	-.519	.744
Model Hyperactivity/Impulsivity						
	coeff	se (HC3)	t	p	LLCI	ULCI
constant	15.116	1.528	9.890	.000	12.079	18.152
Group	-10.409	1.638	-6.357	.000	-13.663	-7.156
CPRS closeness	-.126	.200	-.628	.532	-.524	.272
Group x closeness	.177	.234	.753	.453	-.289	.642
Model Autism						
	coeff	se	Z	p	LLCI	ULCI
constant	-1.013	.448	-2.262	.024	-1.890	-.135
Group	-1.153	.599	-1.922	.055	-2.328	.023
CPRS closeness	-.041	.065	-.625	.532	-.168	.087
Group x closeness	.033	.102	.325	.745	-.167	.233

A further analysis was done to check whether there were significant differences between the adoptees and the biological children CPRS's scores. As the distribution of the CPRS closeness

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and conflict subscales scores were not normally distributed, two Mann-Whitney U test were run to determine if there were differences in the CPRS closeness and conflict subscale scores between the adopted and the biological children. Distributions of the closeness and conflict scores for adoptees and biological children were similar, as assessed by visual inspection. Closeness scores for adoptees (mean rank = 49.94) and biological children (mean rank = 46.57) were not statistically significantly different, $U = 820.500$, $z = -.538$, $p = .590$. Conflict scores for adoptees (mean rank = 47.52) and biological children (mean rank = 47.49) were also not statistically significantly different ($U = 883.500$, $z = -.004$, $p = .997$).

Correlation analyses were run to test whether the closeness and conflict subscales were associated with scores of inattention, hyperactivity/impulsivity, and autism. As the assumption of linearity was violated, there were outliers that were genuinely unusual values, and the assumption of normality was violated as assessed by Shapiro-Wilk's test ($p = .05$); a Kendall's Tau-b was run. There were no significant associations between the closeness and conflict subscales and any of the ND problems.

Table 6 Correlations between ND problems and Closeness and Conflict

Correlations between ND problems and Closeness and Conflict

			Inattention	Hyp/Imp	ASD	Closeness	Conflict
Kendall's tau_b	Inattention	Correlation Coefficient	1.000				
		Sig. (2- tailed)	.				
		N	94				
	Hyp/imp	Correlation Coefficient	.627**	1.000			

		Sig. (2-tailed)	.000	.		
	N		94	94		
ASD	Correlation Coefficient		.218*	.257**	1.000	
		Sig. (2-tailed)	.012	.003	.	
	N		94	94	94	
Closeness	Correlation Coefficient		-.124	-.003	-.061	1.000
		Sig. (2-tailed)	.093	.968	.489	.
	N		94	94	94	94
Conflict	Correlation Coefficient		.124	.092	.125	-.375** 1.000
		Sig. (2-tailed)	.086	.206	.147	.000 .
	N		94	94	94	94 94

2.5 Discussion

The aim of this study was to assess if there was an association between maltreatment and ND outcomes, and whether this relationship was moderated by closeness in the parent-child relationship. Results indicated that maltreatment was related to ND outcomes. There were significant differences in inattention, hyperactivity/impulsivity and autism scores between

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adoptees with a history of maltreatment and biological children. This finding is consistent with previous research (Capusan et al., 2016; Clayton et al., 2018; González et al., 2019). However, it is worth noting that in previous studies where the association between maltreatment, ADHD and ASD was also demonstrated, the covariance was also explained by genetic effects (Dinkler et al., 2017). It is necessary to acknowledge other prenatal or genetic risk factors that may underly ND differences.

YVACS frequency and severity scores of the intrafamilial subscale did not predict inattention and hyperactivity/impulsivity. It is important to note that due to the small number of participants ($n = 15$) in these analyses, they lacked statistical power. It is also worth noting that our sample of adoptees may have been at the high end of severe maltreatment, as they have been removed from their biological family and adopted; therefore, there was likely not much variation on severity. An additional issue with the YVACS is that it is a parent-report measure on maltreatment, and adoptive parents may not be reliable reporters because they may not know the full details of the history of maltreatment or they may score the severity very subjectively.

Although numerous studies have reported on the association between maltreatment and ADHD, the direction of this relationship is yet to be studied at depth. Stern et al., (2018) found strong associations between maltreatment and ADHD, however, their longitudinal study did not support a causal link but highlighted the increased risk for children with ADHD of being maltreated. Other studies have also found that children with ADHD were more likely to experience child maltreatment (Briscoe-Smith & Hinshaw, 2006; Clayton et al., 2018; Ouyang et al., 2008). Similarly, children with ASD have been found to be more likely to experience maltreatment (McDonnell et al., 2019). As the current study is cross-sectional it is not possible to test for the direction of effects. It is important, therefore, to bear in mind that children who exhibit behaviours associated with neurodevelopmental differences may be at an increased risk to experience maltreatment.

The children in the adopted group were over three times more likely to score positive on the autism screen. This finding is important in the context of current clinical debate concerning the challenges to differentiate and identify whether children with a history of severe maltreatment present with ASD or attachment difficulties, or both (Moran, 2010). Attachment difficulties are common in children who experienced maltreatment and have been adopted (Shoemaker & Benuto, 2017). However, there is a tendency to overdiagnose children in care with attachment disorders with the risk of neglecting to explore the presence of neurodevelopmental problems (Woolgar & Scott, 2014). Still, the results from the present study must be interpreted with caution, as screening questionnaires were used and scores dichotomised. There are also studies that have reported that people with autistic traits may be at elevated risk of maltreatment, making it difficult to identify the direction of this relationship (McDonnell et al., 2019).

Previous studies reported associations between parent-child attachment and ADHD, particularly with attachment disorganisation (Thorell et al., 2012). As with the relationship between child maltreatment and ADHD, the direction of the relationship between attachment and ADHD is not clear. Specifically, difficulties including temperamental characteristics associated with ADHD may make it more difficult for the adoptive parents to parent their child in such a way to promote a secure attachment relationship. Additionally, children are often adopted after the infancy period when attachments first develop. Furthermore, these children may experience trauma from the maltreatment itself, and in addition, a relational trauma from the relationship the child has with the perpetrator who is also their caregiver (De Bellis, 2001). Following a trauma of such nature, may have an effect in the way these children relate to others specifically caregivers and thus, how they form attachment with their adoptive parents.

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Despite previous evidence indicating that the attachment relationship may have an effect on ND problems in children in care, particularly on ADHD (Becker-Weidman, 2008; Gurney-Smith et al., 2010; Lind et al., 2017; Purvis et al., 2015), our hypothesis of the parent-child relationship acting as a protective or moderating factor between child maltreatment and ND problems, was not confirmed. A number of considerations need to be made. Firstly, unfortunately, our analyses lacked power due to the small sample size. The ideal sample size for a moderation analysis is not easy to calculate, but previous studies using similar moderation models reported that a sample size of $n=53$ would be adequately powered (Anthony et al., 2019). There have been previous studies where parental warmth, which is associated with secure attachment, moderated the relationship between early adversity and internalising but not externalising symptoms (Anthony et al., 2019). Secondly, the measure of attachment in our study was derived from the CPRS. The CPRS was, to our knowledge, the closest we could get to a questionnaire that measures attachment in school aged children in a way that worked with our design. However, a direct measure of attachment security instead of the CPRS, may have offered a more sensitive assessment of the construct of attachment. Importantly, previous studies where the CPRS has been validated alongside the Strange Situation Paradigm (Holland & McElwain, 2013) and the Attachment Q-set, demonstrated that mother-child attachment security was correlated with more closeness and less conflict (O'Connor et al., 2014). Thirdly, it is important to highlight that the closeness and conflict scores for both groups of children did not significantly differ. Indeed, the mean scores of closeness were slightly higher in the adoptees than in the biological children group. This could mean that even despite the relational trauma that the children may have gone through, they still can form healthy and close relationships to their adoptive parents. Finally, exploration of boxplots showed that there was not much variation in closeness in the adoptees group, this could also explain the non-significant results.

Importantly, the socio-cultural context of the work needs to be considered as this may have influenced the reports gathered about child history, relationships and difficulties. Adoptees

are a vulnerable and a minority group within the general population; and their adoptive parents may also experience themselves as different from the norm. This may affect how they view their relationship with their children, as they may be viewed within the society as not having the same type of relationship than biological parents with their children. Additionally, having access to the records of what their children went through, may affect the way they see their difficulties and thus how this affects their relationship; and therefore as well the conclusions of this study.

Since all measures were parent reported and the quality of the parent-child relationship can affect the way the parents perceive their children's difficulties (Climie & Mitchell, 2017), a final check for possible reporter bias was conducted. We checked whether parents who reported higher conflict in the subscale of the CPRS also reported higher ADHD symptoms or were likely to score their children on autism above the screening threshold. No significant correlations were found.

2.5.1 Limitations

The study had several limitations. Firstly, the sample size was particularly small for the adoptees group. This is partly due to the fact that it is a small group of the general population and, possibly, added effects of the current COVID-19 atmosphere; where parents may have been under unprecedented levels of stress trying to home school children whilst working themselves from home.

The fact that different questionnaires were used for the two versions of the survey, posed additional limitations in the way that the data could be analysed. These amendments were done following piloting and in an attempt to adapt our original study to an online environment in the

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context of COVID-19 restrictions. The early adversity measure should have been the same across surveys, being the YVACS perhaps a better measure as it reports on severity. However, there are some limitations to this too, as the adoptive parents may not have full knowledge of the severity and frequency of the different types of maltreatment, or it may be biased as it is up to them how to score the severity and frequency. Ideally, a measure used by the social workers who have access to the histories prior to adoption such as the Modified Maltreatment Classification System (MMCS; English & the LONGSCAN Investigators, 1997) would have been best, this is what was planned in the original study prior to the COVID-19 restrictions; however, the adoption agency with whom we had a partnership advised that this would not conform with their data protection guidelines. An autism questionnaire across both surveys that reported on severity of symptoms would have also been helpful, so that we could have a continuous variable. There was a considerable loss of power due to dichotomising this variable.

Lastly, parent reported measures come with the limitation of bias in the parents' perception of their child behaviour and subjective rating.

The strengths of this study included that we assessed a sample of adoptees with confirmed experiences of adversity, whilst the majority of research looks at retrospectively reported maltreatment in adulthood.

2.5.2 Future research

Future studies need to explore the moderation analysis with a larger sample size in order to increase power. Another important variable that may have played a role in the relationship between child maltreatment and ND outcomes, and on the parent-child relationship is age at placement. Age at placement is not the same as timing or duration of the maltreatment, because children will have been in foster families or in the system for a period of time prior to being adopted. However, it can still give us valuable information on how may affect outcomes. It could also be argued that age at placement may have effects on the attachment development between

the child and adoptive parents. The age at which maltreatment or neglect occur, as well as age at removal from the family, are of high importance both for the neurodevelopmental outcomes and the development of an attachment relationship. Infancy has been increasingly conceptualised as a time of fast and significant brain growth, facilitating the development of core neurodevelopmental capacities (Newman et al., 2015). Cowell et al. (2015) found in their study that there were in-group differences between children who were maltreated during infancy in comparison to other ages. They exhibited significantly poorer inhibitory control than children without a history of maltreatment. Additionally, the longer the child spends in the family, the more likely he is continuing to be maltreated. The chronicity of maltreatment has deleterious effects, more so than children who experience maltreatment during a single period of development (Cowell et al., 2015). Moreover, it is also during infancy that the attachment relationship develops (Bowlby, 1982). There have been previous studies which identified differences in attachment security between those adopted after age 1 year and those before (van den Dries et al., 2009).

2.5.3 Clinical Implications

Children who have suffered maltreatment often present with complex emotional, behavioural, social and academic difficulties. Neurodevelopmental problems likely play a role in the neurobehavioural difficulties of these children (Kavanaugh et al., 2017). A developmental assessment together with a comprehensive psychological formulation by an expert; for instance, a neuropsychologist, will be of paramount importance when helping these children and their families with their difficulties. Adopted children could benefit from being routinely assessed for ND problems to facilitate early interventions, as very often they are referred for attachment

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interventions when the behaviours that they present with may be explained by non-attachment specific factors; such as a result of trauma or ND problems (Woolgar & Scott, 2014). Often these difficulties are treated in mental health services, and a neurodevelopmental perspective when formulating and treating these difficulties, would be very valuable.

Despite the non-significant results of our moderation analysis to see whether parent-child relationship quality acts as a protective factor, it has been argued in the literature that interventions aimed at improving the quality of attachment and early emotional regulation, whilst also promoting trauma resolution, are arguably neuroprotective and a high priority in terms of modifying the potential negative impact of early stress (Dozier et al., 2008, 2012; Lind et al., 2017; Newman et al., 2015).

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Appendix A Systematic Review Search Terms

(attachment N5 intervention*) OR (attachment N5 therap*) OR (attachment N5 treatment*) OR (attachment N5 psychotherap*) OR "parent child intervention*" OR "parent child therap*" OR "parent child treatment*" OR "parent child psychotherap*" OR "child parent intervention*" OR "child parent therap*" OR "child parent treatment*" OR "child parent psychotherap*" OR "sensitiv* responsiv*" OR theraplay OR "video feedback intervention" OR "video interaction guidance" OR "basic trust intervention" OR "parent-child interaction therapy" OR "trust based relational intervention" OR "GABI" OR "attachment and biobehavioural catch-up" OR "promoting positive parenting" OR "circle of security" OR "toddler parent psychotherapy" OR "promoting first relationships" OR "fostering changes" OR "dyadic developmental psychotherapy" OR "watch wait wonder" OR "promoting attachment" OR "fostering attachments" OR "video-feedback intervention to promote positive parenting" OR "VIPP-FC/A" OR "VIPP-FC" OR "toddler parent psychotherapy" OR "preschooler parent psychotherapy" OR "parent co-therapy" OR "child parent relationship therapy" OR "infant parent psychotherapy" OR "right from the start" OR "promoting first relationships" OR "steps toward effective enjoyable parenting" OR STEEP OR "mother infant psychotherapy" OR "emotional attachment and emotional availability" OR "nurturing attachments"

AND

adopt* OR "children in care" OR "looked after children" OR LAC OR "foster children" OR "foster famil*" OR "foster care" OR "alternative care" OR "kinship care" OR "institutional* care" OR "without permanent parents" OR "out of home care"

AND

neurodevelopment* OR neurodivers* OR ADHD OR inattent* OR overactiv* OR hyperactiv* OR impulsiv* OR "attention deficit hyperactivity disorder" OR "attention deficit disorder" OR ADD OR autis* OR ASD OR ASC OR "autism spectrum disorder" OR "autis* spectrum" OR "executive funct*" OR CBCL OR SDQ OR BRIEF OR TOVA OR SNAP OR BASC OR "Conners CBRS" OR "strengths and difficulties questionnaire" OR "child behavio* checklist" OR "test of variables of attention" OR

Appendix A

“conners comprehensive behavior* rating scale” OR “behavior* assessment system for children”
OR ADOS OR ADI-R OR SCQ OR “social communication questionnaire” OR AQ.

Appendix B Quality Assessment of Papers of the Systematic Review

	1. Moody, et al., 2020	2. Midgley, et al., 2019	3. Lind, et al., 2017	4. McCullough, et al., 2016	5. Purvis, et al., 2015	6. Gurney- Smith, et al., 2010	7. Maki, 2002	8. Staines, Golding and Selwyn, 2019	9. Colonnesi, et al., 2012	10. Golding and Picken, 2004	11. Laybourne, Andersen and Sands, 2008	12. Becker- Weidman, 2006	13. Wassall, 2011	14. McCullough & Mathura, 2019
	Reporting													
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	0	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	0	1	1	1
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	UTD	1	UTD	1	UTD	UTD	UTD	0	1	UTD
10	1	1	1	1	1	1	1	0	1	1	1	1	1	1

Appendix B

External Validity														
11	1	0	1	1	1	1	0	UTD	UTD	1	1	1	1	1
12	1	1	1	1	1	1	1	1	UTD	1	1	1	1	1
13	1	1	1	UTD	0	1	1	1	1	1	1	1	1	1
Internal Validity – bias														
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0.5	0.5	0	0	0	0	0	0	0	0	1	0
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	1	1	1	UTD	UTD	1	UTD	1	UTD	UTD	UTD	0	1	UTD
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Internal Validity - confounding (selection bias)														
21	1	UTD	1	UTD	1	UTD	UTD	UTD	UTD	1	UTD	1	1	1
22	1	UTD	1	UTD	1	UTD	UTD	UTD	UTD	UTD	UTD	1	1	1
23	1	0	1	0	1	0	0	0	0	0	0	0	0	0
24	1	0	UTD	0	0	0	0	0	0	0	0	0	0	0
25	1	0	1	1	1	0	1	1	1	0	0	1	1	1
26	1	0	0	0	UTD	1	UTD	1	1	UTD	UTD	UTD	1	UTD
Power														
27	1	UTD	UTD	UTD	UTD	0	UTD	UTD	1	UTD	UTD	UTD	0	UTD
Total Score	23	15	20.5	14.5	18	18	15	17	16	16	14	18	22	18

Good Fair Good Fair Fair Fair Fair Fair Fair Fair Fair Fair Good Fair

* yes=1, no=0

**Excellent = 26-28 Good = 20-25 Fair = 15 - 20 Poor = <14

Appendix C Ethical Approval



UNIVERSITY OF
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ERGO II – Ethics and Research Governance Online <https://www.ergo2.soton.ac.uk>

Submission ID: 55675.A5

Submission Title: The influence of early life experiences on development- a survey study (Amendment 5)

Submitter Name: Dennis Golm

Your submission has now been approved by the Faculty Ethics Committee. You can begin your research unless you are still awaiting any other reviews or conditions of your approval.

Comments:

-

[Click here to view the submission](#)

TId: 23011_Email_to_submitter___Approval_from_Faculty_Ethics_committee__cat_B___C_ Id: 352189

cmcm1e17@soton.ac.uk coordinator

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ERGO II – Ethics and Research Governance Online <https://www.ergo2.soton.ac.uk>

Submission ID: 54009.A3

Submission Title: The impact of early experiences on development:
Markers of vulnerability and resilience (Amendment 3)

Submitter Name: Amber Newell

The Research Integrity and Governance team have reviewed and approved your submission.

You can begin your research unless you are still awaiting specific Health and Safety approval (e.g. for a Genetic or Biological Materials Risk Assessment) or external review.

The following comments have been made:

-
-

TId: 23012_Email_to_submitter___Approval_from_RIG Id: 352357 cmcm1e17@soton.ac.uk coordinator

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Appendix D Participant Information Sheet

Parent Participant Information Sheet

Study title: The influence of early life experiences on development

Researcher names: Dr Dennis Golm, Dr Jana Kreppner, Carmen, Caro-Morente, Laura Douglas, Derek Hanley, Amber Newell

ERGO number: 55675

You are being invited to take part in the above research study. To help you decide whether you would like to take part or not, it is important that you understand why the research is being done and what it will involve. Please read the information below carefully. You may like to discuss it with others, but it is up to you to decide whether or not to take part. If you are happy to participate you will be asked to provide online consent by ticking a box before the start of the survey.

What is the research about?

This project is led by Dr Dennis Golm and Dr Jana Kreppner and the research is being conducted by postgraduate students of the University of Southampton who are working towards their doctorate in either Clinical or Educational Psychology.

As part of the study, we will compare parent reports on adopted children with a history of maltreatment and parent reports on biological children without a history of maltreatment.

The majority of adopted children will have experienced early adversity (e.g. physical abuse or neglect) prior to being adopted into a secure and stable environment. Research has shown that a history of early adverse experiences increases the risk for mental health and attachment problems later in life. Please note that this does not mean that children with such experiences *will* develop any problems. It merely means that they have a higher risk than someone who did not experience maltreatment when growing up.

At the Centre for Innovation in Mental Health at the School of Psychology, we are trying to understand how a history of maltreatment increases the risk for later life mental health and attachment problems. We are also interested in factors that protect children from developing these problems. Understanding the mechanisms between early maltreatment experiences and the development of attachment and mental health problems, could inform research into the prevention of these problems in vulnerable children.

Why have I been asked to participate?

You can take part in this study if you are living in the UK and have a child between 6 and 11 years of age who has not been diagnosed with Foetal Alcohol Syndrome and who has been adopted and

experienced maltreatment (e.g. abuse or neglect) prior to adoption OR who is your biological child and never experienced maltreatment (e.g. abuse or neglect).

What will happen to me if I take part

If you consent to take part in this research, we will ask you to complete a survey about you and your child. Please see “What data will be collected?” for further details.

Are there any benefits in me taking part?

There are no immediate benefits for you participating in the project. Your participation may however help us further our knowledge and understanding of the potential impact of adverse childhood experiences on child development and the mechanisms that may increase or decrease vulnerability to mental health problems.

Are there any risks involved?

We will ask you to complete some questionnaires about your child and yourself. Some parents may find it upsetting to think about their child’s experiences, emotions or behaviours or their own mental health.

What data will be collected?

The questionnaire you as a parent will be completing will ask about some demographic information about you and your child (whether you are a biological or adoptive parent, your child’s age and date of birth, your child’s gender, number of adopted and biological children in your family, whether your child has a diagnosis Foetal Alcohol Syndrome, whether your child has an Education and Health Plan, your age, your gender, your parental role and socio-economic status; in case of adopted children the move-in date of your child, number of and time spent in previous placements prior to adoption and time spent in their biological family), your child’s negative life experiences (e.g. maltreatment), your child’s exposure to drugs and alcohol in the womb, your child’s mental health, emotions, behaviours, communication skills and relationship with you and others. You will also be asked to complete questionnaires about your emotions towards others, and your health and wellbeing. Each questionnaire will be pseudonymised which means that a unique study ID will be assigned to each questionnaire instead of your name.

You can further opt-in to be re-contacted for future studies by providing your email address. This way, we will be able to link the data provided in this study to future data you may provide. You will be able to opt-out at any time. Your email address will be linked with your unique identifier in a password protected file which will be saved in a separate location to your other data. All electronic data will be stored on password protected computers or secure university servers that can only be accessed by the study team.

Will my participation be confidential?

Your participation and the information we collect about you during the course of the research will be kept strictly confidential (see above for information on data handling and storage).

Only members of the research team and responsible members of the University of Southampton may be given access to data about you for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations. Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access to your data. All of these people have a duty to keep your information, as a research participant, strictly confidential.

Furthermore, we may deposit data in the ReShare (<http://reshare.ukdataservice.ac.uk>) data repository under safeguarded access. Data stored in the repository may only be used for research and learning purposes and not for any commercial purposes. To ensure anonymity, data deposited will not include any information that may potentially identify individuals. We will remove date of birth the date your child joined the family and any free text replies from the data table. Instead it will contain your child's age in years and, if applicable, the age of placement in months (age your child joined your family in case of adopted children). Sharing data enables a wider use and public benefit of the data. The use of data cannot be restricted to certain research areas, but given its nature, we expect the data to be used for research in psychology or psychiatry.

Do I have to take part?

No, it is entirely up to you to decide whether you wish to take part in this study. If you decide you want to take part, please indicate your consent by ticking the box below.

What happens if I change my mind?

You have the right to change your mind and withdraw at any time without giving a reason (just close the browser window). If you withdraw from the study, we will keep the information about you that we have already obtained for the purposes of achieving the objectives of the study only.

What will happen to the results of the research?

Data will be published in scientific papers and/or will be written up as part of doctoral thesis. Data may further be presented at scientific conferences/ meetings or outreach/ public engagement activities. Research findings made available in any reports or publications will not include information that can directly identify you without your specific consent.

Where can I get more information?

If you would like any more information or have any questions, please do not hesitate to contact the research team: CARE@soton.ac.uk

What happens if there is a problem?

If you have a concern about any aspect of this study, you should speak to the researchers who will do their best to answer your questions (Please see contact details above).

If you remain unhappy or have a complaint about any aspect of this study, please contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

Data Protection Privacy Notice

The University of Southampton conducts research to the highest standards of research integrity. As a publicly-funded organisation, the University has to ensure that it is in the public interest when we use personally-identifiable information about people who have agreed to take part in research. This means that when you agree to take part in a research study, we will use information about you in the ways needed, and for the purposes specified, to conduct and complete the research project. Under data protection law, 'Personal data' means any information

Appendix E

that relates to and is capable of identifying a living individual. The University's data protection policy governing the use of personal data by the University can be found on its website (<https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page>).

This Participant Information Sheet tells you what data will be collected for this project and whether this includes any personal data. Please ask the research team if you have any questions or are unclear what data is being collected about you.

Our privacy notice for research participants provides more information on how the University of Southampton collects and uses your personal data when you take part in one of our research projects and can be found at

<http://www.southampton.ac.uk/assets/sharepoint/intranet/Is/Public/Research%20and%20Integrity%20Privacy%20Notice/Privacy%20Notice%20for%20Research%20Participants.pdf>

Any personal data we collect in this study will be used only for the purposes of carrying out our research and will be handled according to the University's policies in line with data protection law. If any personal data is used from which you can be identified directly, it will not be disclosed to anyone else without your consent unless the University of Southampton is required by law to disclose it.

Data protection law requires us to have a valid legal reason ('lawful basis') to process and use your Personal data. The lawful basis for processing personal information in this research study is for the performance of a task carried out in the public interest. Personal data collected for research will not be used for any other purpose.

For the purposes of data protection law, the University of Southampton is the 'Data Controller' for this study, which means that we are responsible for looking after your information and using it properly. The University of Southampton will keep identifiable information about you for 10 years after the study has finished after which time any link between you and your information will be removed.

Thank you for taking the time to read the information sheet and considering taking part in this research study.

Appendix E Debriefing Form



Debriefing Statement (*written; version 2, 29/06/2020*)

ERGO ID: 55675

The aim of this research was *to identify factors associated with an increase or decrease of mental health and attachment problems after early adverse experiences*. It is expected that *problems in regulating emotions (how people deal with strong emotions) are associated with an increase in attachment and mental health problems, while parental empathy, good emotion regulation and positive relationships with others are expected to protect against these problems*. Your data will help our understanding of *potential early markers of later life attachment and mental health problems*.

Once again results of this study will not include your name or any other identifying characteristics. The research did not use deception. A summary of the research findings can be made available to you after completion of the project: Please email CARE@soton.ac.uk (Subject: Survey) if you would like to be sent such a summary.

If you opted-in to be re-contacted for future research you will receive additional information regarding what this will involve as well as an opportunity to provide consent for you and/or your child's participation.

Thank you for your participation in this research.

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

If you experienced any distress and/or require further support, please use the contact numbers below or contact your GP:

Samaritans (24h support helpline):

116 123

Child and Adolescent Mental Health Services (CAMHS) Parents Helpline:

0808 802 5544

Child abuse and neglect helpline from the National Society for the Prevention of Cruelty to Children (NSPCC):

0808 800 5000 (help for adults concerned about a child)

National Adoption and Fostering Clinic:

<https://www.nationaladoptionandfosteringclinic.com>

Appendix F Adverts




We are looking for families to be part of the CARE Project

Click here for more information [\[HYPERLINK\]](#)



Study title: The influence of early life experiences on development
Ethics (ERGO) number: 55675

The Centre for Innovation in Mental Health Adversity Research (CARE) Project at the School of Psychology tries to understand how early adverse experiences, such as experiences of abuse and neglect, increase the risk for attachment and mental health problems and which factors protect children from developing such problems. The current study will run until 28th of February 2021.

Can you help?
Did you adopt a child who has experienced abuse or neglect prior to adoption?
Is your child between 6 and 11 years old?
No diagnosis of Foetal Alcohol Syndrome?




We are looking for families to be part of the CARE Project

Click here for more information [\[HYPERLINK\]](#)



Study title: The influence of early life experiences on development- a survey study
Ethics (ERGO) number: 55675

The Centre for Innovation in Mental Health Adversity Research (CARE) Project at the School of Psychology tries to understand how early adverse experiences, such as experiences of abuse and neglect, increase the risk for attachment and mental health problems and which factors protect children from developing such problems. We will be comparing children with and without a history of abuse and neglect. **We are currently looking for children WITHOUT a history of abuse and neglect to be part of our comparison group.** The current study will run until 28th of February 2021.

Can you help?
Do you have a biological child who has never experienced abuse or neglect?
Is your child between 6 and 11 years old?
No diagnosis of Foetal Alcohol Syndrome?

