University of Southampton

Faculty of Environmental and Life Sciences

School of Psychology

The Impact of Early Experiences on Empathy and Emotion Regulation Development: Markers of Vulnerability and Resilience

by

Amber Newell

ORCID ID 0000-0002-4674-2128

Thesis for the degree of Doctorate in Educational Psychology

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Experiencing maltreatment in childhood can have detrimental and long-term effects on a child's development. Maltreatment is the main reason for children to be removed from their family settings and to be looked after by alternative caregivers. Research has demonstrated that even after removal from the maltreating context, many children continue to experience persistent socioemotional difficulties. Less is known about the impact of maltreatment on children's development of empathy and emotion regulation (ER) specifically and the ways that alternative caregiving protects against negative effects of maltreatment. Empathy and ER are key competencies that underpin a wide variety of other socioemotional skills. This thesis presents two related studies. Firstly, a systematic literature review was conducted to consider the literature exploring the impact of alternative caregiving on ER development. Eight studies were included that compared ER between children with and without experiences of maltreatment and subsequent transition to alternative care arrangements. Half of the studies concluded that maltreatment is associated with significantly less ER and an additional two studies found similar, but non-significant results. There are very few studies that have this focus, highlighting a need for further research. Secondly, empathy was assessed in 27 school-age adopted children with a history of maltreatment and compared with empathy measured with 72 non-adopted, non-maltreated children who live with their biological parents. It was hypothesised that maltreatment would have a negative impact on empathy development resulting in the adopted children scoring lower on empathy measures. It was also hypothesised that caregiver and child empathy would be associated and that this relationship would be moderated by maltreatment (group) status. The findings were that adopted children scored lower on parent-report questionnaire and behavioural measures of empathy. There were significant associations between parent and child measures of empathy, but maltreatment status did not significantly moderate this association. Taken together, both studies identify difficulties maltreated children have even within a context of adoption and fostering with empathy and emotion regulation development. The implications of this are discussed broadly and more specifically related to an educational psychology context.

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Research Thesis: Declaration of Authorship

Print name: Amber Margaret Newell

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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:3.9.21

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Definitions and Abbreviations

CLA ..... Children Looked After - a term used in the UK to indicate that a child or young person's care is mandated by the local authority

CYP ..... Children and young people – an inclusive term commonly used to refer to those under the age of 25 in the UK in an Educational Psychology context

DfE..... Department for Education, UK

Empathy……..the ability to share feelings with another and involves comprehension of another's emotional state and experience such that it is experienced as one's own

ER ..... Emotion Regulation - skills and processes applied to enable an individual to manage their own emotional experiences successfully, preventing empathic overarousal and enabling an appropriate, prosocial and empathic response to another's distress

EP ..... Educational Psychologist

Institutionalisation…… a specific type of maltreatment widely explored in the literature that can involve both direct forms of abuse (Sherr et al., 2017) and extreme forms of neglect and deprivation (Sonuga-Barke et al., 2017)

Maltreatment……. "any act or series of acts of commission or omission by a parent or other caregiver that results in harm, potential for harm or threat of harm to a child" (Leeb et al., 2008, p.11)

PI ..... Previously Institutionalised

SEMH……Social, Emotional and Mental Health – one of the four areas of Special Educational Needs in the UK

SEN..... Special Educational Needs - a term commonly used to describe learning differences, difficulties or disabilities which affect a child or young person's learning experiences

UK..... United Kingdom

UNICEF ..... United Nations International Children's Emergency Fund

WHO..... World Health Organization

Chapter 1 The Impact of Early Experiences on Empathy and Emotion Regulation Development: Markers of Vulnerability and Resilience – An Introduction

1.1 Overview

This thesis follows guidance for the PhD three paper thesis format. Each of the following two papers are to be considered as self-contained pieces of work written in the style that would permit submission for publication in selected, peer-reviewed journals. This thesis aims to develop understanding of the impact of maltreatment and subsequent alternative caregiving arrangements on children's empathy and emotion regulation (ER) development.

This introduction chapter provides contextual information to enable the reader to engage with the papers (see Chapters 2 and 3). First, a summary outlining the impact of maltreatment on child development is provided. Then, information relating to the current situation and details about alternative care arrangements in the UK is given. This introduction also explores and defines empathy and ER. In doing so, the rationale for the decisions made for each piece of research are made clear. The relevance of the information presented and gained through this research project to educational psychologists is considered.

1.2 The Impact of Maltreatment

Literature pertaining to the impact of maltreatment is further explored in the following chapters. However, as a way of preparing the reader an overview of the research area is provided here. Leeb et al. (2008, p.11) defines maltreatment as "any act or series of acts of commission or omission by a parent or other caregiver that results in harm, potential for harm or threat of harm to a child". Typically, it is categorised into four subtypes, three of which involve direct harm or threat of harm (physical, sexual, and emotional abuse) along with neglect, which involves omission of care. Exposure to maltreatment is associated with a wide range of outcomes that pose difficulties for children to experience life satisfaction including academic attainment (Brown et al., 2017), positive relations (DeLuca et al., 2019; Zamir, 2021), mental health and wellbeing (Askeland et al., 2017). For example, meta-analytic evidence of longitudinal research shows that maltreated children have

approximately two times higher risk of developing depression in adulthood (Li et al., 2016). Zamir's (2021) review highlights the negative impact of maltreatment experiences on quality of relationships in adulthood, with ER being a significant mediator. Luke and Banerjee's (2013) systematic review and meta-analysis highlights how socioemotional skills are an area of difficulty commonly experienced by maltreated children. Socioemotional skills comprise a range of abilities including regulation of thoughts, feelings, and behaviours, prosociality and empathic understanding. In non-maltreated populations, difficulties in this psychological domain are typically associated with negative outcomes (for example see reviews by Compas et al., 2017 and Stern & Cassidy, 2018). Therefore, skills and difficulties relating to the socioemotional domain of psychology could well be a key mechanism by which maltreatment is associated with later negative outcomes.

Institutionalisation is a specific type of maltreatment widely explored in the literature that can involve both direct forms of abuse (Sherr et al., 2017) and extreme forms of neglect and deprivation (Sonuga-Barke et al., 2017). Institutionalisation has its own additional and unique set of associated outcomes known as deprivation-specific psychological patterns (Kumsta et al., 2010). Despite there being some differences in outcomes related to maltreatment independent of and within institutions, the general consensus is that experiences of maltreatment are detrimental to child development and should be avoided where possible. Globally, governments widely accept a responsibility to prevent harm to children and are in support of mandates by UNICEF, WHO, etc. This thesis discusses maltreatment as an all-inclusive term that incorporates maltreatment which occurs in familial and institutional settings. The author recognises that maltreatment can take other, extra-familial, forms such as discrimination, harassment, bullying, and displacement but for the purpose of this project these were not considered within the working definition of maltreatment.

1.3 The UK Context

Unsurprisingly, children with a history of maltreatment present with more difficulties than those without such a history and this trajectory persists into adulthood (Mersky & Topitzes, 2010). The UK's approach to protecting children against maltreatment is preventative; it aims to reduce the impact of evidence-based negative developmental trajectories. It is well summarised by Wilkinson and Bowyer (2017, p.36) in their review of research and evidence in the UK: "Given the evidence, every effort should be made, firstly to support parents to achieve positive change, and, where this is not possible, to place children in an alternative, nurturing and stable environment at the earliest opportunity." When families have a child in alternative care they are monitored and supported by social services. The UK system prioritises reunification of the child with their biological caregiver

where this is possible and in the best interest of the child. Where it is not possible, the system looks at opportunities for long-term care firstly within the family network, via arrangements called kinship care or special guardianship orders (SGOs), and then via foster care or adoption. Children in foster care are collectively called children looked after (CLA) which is a term to indicate that their care is mandated by the local authority. Adoption is not as common because of its permanence and requirement for the child to be formally renounced as the biological caregivers' responsibility. Only a small portion, approximately four percent (or 3,440 children), of all CLA were adopted in 2020, signalling a decrease of four percent from the previous year (Department for Education (DfE), 2020a). This can partly be accounted for by an increase in SGOs being granted but adoption agencies have expressed concern about the reduced number of available adopters (e.g., Adoption UK, 2019).

Educational Psychologists (EPs) are invited to work with children and families for a wide variety of reasons. Often, they are invited by schools to work with children who present with Social, Emotional and Mental Health (SEMH) difficulties and their families. Whilst difficulties relating to this area of need can stand independent of others, they are most often interlinked with other areas of need. For example, a child who has difficulties with dysregulation will most likely have difficulties with other related executive functioning skills that influence their ability to access learning. This is accounted for by the theory of latent vulnerability (McCrory et al., 2017) which is described in Chapter 2 and supported by neurobiological research into brain development underpinning these skills (Fuster, 2000) and the impact of maltreatment on these areas (Bick & Nelson, 2016).. Part of an EPs role is to gather information pertaining to the child which can involve gathering a developmental and personal history. Common areas of concern raised with EPs relating to adopted or CLA are underpinned by SEMH difficulties including relationships with the caregivers and peers. Luke and Banerjee (2012) found this same focus of concern in a qualitative study with foster carers.

Recent statistics show that over 50 percent of CLA have special educational needs (DfE, 2020b). This makes them four times more likely than all children to have SEN (special educational needs). Further, CLA are nine times more likely to have an Education, Health and Care Plan (EHCP) which is a statutory document outlining support needed for the child's specific areas of SEN (DfE, 2020b). In the UK the majority of CLA or adopted children have a history of abuse and neglect (Bentley et al., 2020). Alternative caregiving in the form of kinship and foster care are the most common 'solution' to supporting maltreated children, prevent negative outcomes and provide safety. Taking both the UK statistics relating to outcomes and existing knowledge from the literature about the impact of maltreatment, it is clear that maltreated children need support. The support provisions in place need to be carefully considered and continuously evaluated and monitored to ensure their impact is well understood and enhanced.

1.4 Motivation for the Thesis

One of the main theoretical areas that influenced this thesis was evidence of a 'catch-up' effect (e.g.,Van IJzendoorn & Juffer, 2006). Children who experience maltreatment show catch-up in some developmental domains such that they match their non-maltreated counterparts or make development beyond that of their peers who remain in maltreated environments. Whilst alternative caregiving arrangements offer substantial benefits to children and young people with a history of maltreatment, the positive and preventative impacts are not always consistent nor do they appear evident across all psychological domains. For example, there is evidence of catch-up, compared to non-adopted peers, in cognitive domains but less evidence of this in mental health and socioemotional domains (Van Ijzendoorn & Juffer, 2006). Factors like age at adoption change the trajectory of catch-up potential with younger children showing more complete catch-up. This highlights the need for research into specific aspects of alternative caregiving arrangements that are most successful for certain characteristics of children. It also highlights a multitude of psychological domains to consider when exploring the extent of a 'catch-up' effect.

The other area of research that intrigued the author prior to formulating this thesis related to the theory of latent vulnerability (McCrory et al., 2017). This model postulates that changes at neurobiological levels underpin evident behavioural changes and alterations resulting from maltreatment. These changes, and specifically in the case of ER systems, pose risk and resilience factors for future psychopathology. It is critical to consider and understand the roles of both risk and resilience factors. Resilience is a term used to refer to instances when individuals have positive outcomes despite experiencing risk factors which can predispose them to negative outcomes. Fritz et al (2018) identified twenty resilience factors that can reduce risk of psychopathology following childhood adversity, four of which coincidentally involve ER skills. Family support and parenting were also identified as effective resilience factors. Throughout the author's training to be an EP they have advocated for and offered strategies to build on areas of strength and resilience they notice or learn about that children and young people possess. This approach compliments system-level preventative measures (e.g., alternative care) in reducing risk factors and promoting resilience or protective factors. Considering the author's existing knowledge and understanding of how significant empathy and ER are in forming a foundation for development of a wide variety of other skills that help children succeed in the UK, including social and learning skills, they wondered how maltreatment and alternative caregiving impacted these domains specifically. The author contextualised this curiosity within existing theories and evidence-bases pertaining to 'catch-up', latent vulnerability and resilience.

1.5 Empathy and Emotion Regulation

The impact of maltreatment on children's socioemotional skills has a fairly limited evidence base despite an established understanding that difficulties in this domain have negative consequences, as outlined previously (Luke & Banerjee, 2013). The available evidence base stems from a variety of methodologies and lacks consistency in results. Importantly, much evidence is derived from retrospective studies of adults (e.g., Sonuga-Barke et al. 2017; Norman et al. 2012). There is a limited amount of prospective longitudinal and cross-sectional research using child participants and researchers postulate that different methodologies identify non-overlapping groups (Baldwin et al., 2019; Newbury et al., 2018). This highlights a need for research with children directly. Luke and Banerjee's (2013) review highlights difficulties maltreated children have with socioemotional skills and how individual differences related to these skills and children's experiences contribute to different profiles of social understanding. Their review included research assessing socioemotional skills including emotion recognition, understanding and perspective taking. These skills relate to the cognitive aspect of empathy and predict empathic skills and behaviours more generally (Cuff et al., 2014).

Empathy is the ability to share feelings with another and involves comprehension of another's emotional state and experience such that it is experienced as one's own. It also has affective and behavioural components, complimenting the cognitive component (Cuff et al., 2014). Its multidimensionality provides different areas and skillsets where individual differences can have influence. It also poses challenges in research though because it is difficult to consistently conceptualise and operationalise (Cuff et al., 2014). This may account for why there is surprisingly very little research exploring empathy development in children who have experienced maltreatment, especially considering the variation in related socioemotional skills. ER is another socioemotional skill that has received limited attention in research within a context of maltreatment and alternative caregiving. ER involves processes of "monitoring, evaluating and modifying emotional reactions" in order to respond in socially appropriate and functional ways to the environment (Thompson, 1994, pp. 27-28). ER strategies or skills can be applied at any stage of an emotional expression, including before, during or after. Gross's (2014) process model distinguishes between antecedent and response-focused ER strategies.

Empathy and ER are inextricably linked and skills within both domains complement one another. For example, when witnessing distress in another, ER skills enable an individual to manage their own emotional experiences successfully, preventing empathic overarousal and enabling an appropriate, prosocial and empathic response to another's distress. In this instance, difficulties with

applying and moderating empathy and ER skills would result in experienced personal distress and limited application of ER strategies to manage these emotions. Therefore, it is important that children develop adequate empathy and ER skills to achieve social and emotional functioning and wellbeing. Considering the evidence in other, related domains, as mentioned previously, it is unfortunately likely that these skills are also negatively impacted by maltreatment experiences.

According to models posited by Hoffman (1983) and Eisenberg et al. (1998) (see also Spinrad & Eisenberg, 2019), parental socialization practices, such as warmth, sensitivity, modelling and talking about, labelling, and providing explanations for emotions shape a child's empathy and ER development (see also Main & Kho, 2020; Spinrad & Eisenberg, 2019). In a typical and safe environment children experience and express less unregulated distress and, through enhanced cognitive (e.g., executive functioning, language) and emotional skills, experience more regulated sympathy and empathy. Furthermore, both empathy and ER have their bases in attachment which is compromised in maltreating environments (Mikulincer & Shaver, 2019; Panfile & Laible, 2012; Stern & Cassidy, 2018). Bowlby's (1969) attachment theory posits that ER and empathy develop in the context of early attachment relationships. Stern and Cassidy's (2018) theoretical model of individual differences in empathy emphasize the role of attachment and parental empathy. Whilst other factors, like temperament, will also have an influence (Spinrad & Eisenberg, 2019; Stern & Cassidy, 2018), positive caregiver-child attachment supports subsequent child empathy and ER development. Attachment-related differences have been found to be linked with variations in empathy (Stern & Cassidy, 2018) and ER (Panfile & Laible, 2012). A secure attachment encourages regulation and effective management of negative emotions such that children can experience more empathic concern than personal distress.

Maltreating parents have been reported to demonstrate less empathy, for example increased personal distress when faced with negative experiences in another, reduced perspective taking abilities and less empathic concern (Asla et al., 2011; Kim & Cicchetti, 2010; Meidan & Uzefovsky, 2020; Shipman et al., 2007; Shipman & Zeman, 2001). Parental empathy difficulties influences the type of parenting practices used and results in less opportunity for maltreated children to have empathic and regulated responses modelled to them and less experience of having a caregiver co-regulate with them (Eisenberg et al., 1998; Hersh & Hussong, 2009; Shipman et al., 2007; Shipman & Zeman, 2001; Zhou et al., 2002). It also results in more critical and punitive parenting practices which is associated with child empathy difficulties (Cornell & Frick, 2007; Yoo et al., 2013). Research has focused on associations between caregiver and child empathy in typical (i.e., socialization theories) maltreating or 'at-risk' contexts (e.g., Meidan & Uzefovsky, 2020) but there is limited focus on associations in alternative care contexts. It is clear that empathy and ER are domains which are

vulnerable and sensitive to inadequate, maltreating caregiving environments therefore making it likely that maltreated children will have difficulties with these areas. Investigation of caregiver and child empathy associations within alternative care settings allows for exploration and consideration of how introduction of an attuned, empathic and regulated caregiver, who can provide appropriate modelling and teaching to a child, influences empathy and ER development following maltreatment.

Whether the interruptions to ER and empathy development have longstanding and enduring negative consequences despite introduction of protective factors like alternative caregiving is not yet thoroughly investigated. Previously institutionalised adopted children do show some catch-up in attachment (van Ijzendoorn & Juffer, 2006) suggesting that empathy and ER could also be positively affected by alternative caregiving. However, similar research into empathy and ER is not present. The papers presented in this thesis look to build on a dialogue relating to this vulnerability so that a good understanding of need can be established. It is likely that for some maltreated children their difficulties with empathy and ER are key mechanisms for other areas of difficulty (e.g., psychopathology – see Brook & Kosson, 2013; Kim & Cicchetti, 2010), and it is important to be able to accurately identify when these domains are impacted so that they can be supported appropriately.

In summary, empathy and ER development in the context of maltreatment and subsequent alternative caregiving is worthy of further investigation for two reasons. Firstly, empathy and ER develop in the context of close relationships, and these are childhood experiences that are commonly compromised in maltreating environments. Parental behaviours implicated in secure attachments (e.g., emotional reciprocity, socialization, emotion coaching) underpin development in these areas. Children observe their parents' emotional responses to others, listen to their parents explain reasons for emotions and their associated behaviours, and discuss ER strategies to cope with distressing emotions. It follows that an absence of these experiences or negative parenting experiences have adverse consequences on empathy and ER development. Secondly, empathy and ER are the cornerstones for many other prosocial trajectories in other developmental domains. Therefore, it is crucial to have a thorough understanding of how empathy and ER are impacted when factors that contribute to their development are compromised. Alternative caregiving and other support systems can then be applied in a child-centred, preventative and understanding way to promote catch-up and enhanced development of these key socioemotional skills.

1.6 Relevance to Educational Psychologists

Empathy and ER underpin prosocial behaviours (Robinson, 2008; Song et al., 2018). These are encouraged in society and particularly so in schools. They allow for successful peer interactions, relationships and general social and emotional wellbeing (Lam, 2012). These outcomes should be achievable for all children and maltreated children will need differentiated support to ensure they have equitable opportunities to experience these. Considering the benefits of having a caregiver to role model regulated and empathic responding there is a role for multiple adults in a maltreated child's life to provide these experiences where possible. School, along with alternative caregiving, pose viable environments for these experiences to be fulfilled. Maltreated children will need more support to manage difficult emotions. An EP has a role to support school staff in considering how to provide a sensitive, attuned and nurturing environment within which maltreated children have an opportunity to thrive. EPs can draw on their expertise in relevant fields such as resilience to identify what key protective factors can protect against the impact of maltreatment. They can also apply theoretical knowledge and understanding of empathy and ER development and be creative in thinking about how to provide opportunities that maltreated children have not had. For example, drawing on Stern and Cassidy's (2018) theoretical model of individual differences in empathy offers a clear and visual outline of influencing factors where school staff can intervene. School staff need to be supported and provided with adequate training on managing the socioemotional needs of their students to avoid negative impacts on attending to learning tasks and making progress with learning (Jennings & Greenberg, 2009). There is a significant lack of evidence based research exploring how schools can best support maltreated children and other victims of trauma (Maynard et al., 2019) and EPs are well placed to contribute to this evidence base. There are also opportunities for multi-agency collaborative working where EPs and experts within adoptive and fostering agencies can learn from one another.

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Chapter 2 A systematic literature review exploring the impact of maltreatment and subsequent alternative caregiving on children's emotion regulation

Abstract

This systematic review aims to summarise and synthesise the existing evidence base evaluating the impact of maltreatment and subsequent alternative caregiving on children's emotion regulation (ER) development. Five databases were systematically searched including PsycInfo, PubMed, Web of Science, ERIC and Social Care Online. Abstracts were co-screened by two researchers before reviewing full-texts for suitability of inclusion. A total of 2,133 abstracts were screened following removal of duplicate results. Included studies were quantitative and compared maltreated (including a history of institutionalisation) children living in alternative care arrangements with children who live with their biological caregivers. A total of eight studies were included in this review that compared ER measures between two groups of children. Half of the studies found significant difficulties with ER within the maltreated groups. Two studies had similar, but non-significant results. One study found alternative caregiving to be associated with ER development advantages such that the maltreated sample scored higher on the ER measure than the non-maltreated group. One study had a comparison group that remained in a maltreating environment. They reported that alternative caregiving is a more beneficial environment for ER development than remaining in a maltreated context; a deficit compared to children living in typical caregiving arrangements remained. Studies varied in their alternative caregiving context being investigated; adoption and foster care contexts were considered. Variability in alternative caregiving context and conceptualisation and measurement of maltreatment and ER account for some of the different results. This review concludes that both foster care and adoption is associated with positive ER development following maltreatment. A greater number of studies reviewed the influence of adoption following institutionalisation and concluded benefits for ER development. There is a need for further research to validate and build on the existing literature including longitudinal research, examination of the effects of maltreatment type, frequency and severity, and exploration of other alternative caregiving arrangements.

2.1 Introduction

Early childhood adversity and maltreatment are considered widespread phenomena impacting on the development and wellbeing of millions of children all over the world (Stoltenborgh et al., 2015). The prevalence in the UK has increased overtime with recent analysis in 2020 suggesting an incident rate of 60.1 per 100,000 children (Chandan et al., 2020). Maltreatment is a specific type of adversity involving abuse and neglect including deprivation through institutionalisation (van IJzendoorn et al., 2011). It is defined as "any act or series of acts of commission or omission by a parent or other caregiver that results in harm, potential for harm or threat of harm to a child" (Leeb et al., 2008, p.11). Whilst research debates global prevalence, in part because of varied definitions and methodological approaches, there is contrastively substantiated agreement that maltreatment negatively affects child development and flourishing. Meta-analyses and systematic reviews of relevant literature highlight the ways that maltreatment is associated with detrimental effects on psychopathology (Kim & Cicchetti, 2010; Norman et al., 2012), socio-emotional development (Luke & Banerjee, 2013) and physical health outcomes (Norman et al., 2012).

The majority of research into the impact of maltreatment is conducted with adults using retrospective assessment of maltreatment experiences (Kraaijenvanger et al., 2020; McGrath et al., 2017). Studies where maltreatment is assessed during childhood prospectively or retrospectively is more limited and tends to be cross-sectional or correlational (Kim & Cicchetti, 2010; Kreppner et al., 2007; Li et al., 2016; Luke & Banerjee, 2013; Sonuga-Barke et al., 2017; Van IJzendoorn & Juffer, 2006), with a few exceptions (Clark et al., 2010; Esposti et al., 2020). The different approaches to research identify different, non-overlapping samples which is why it is vital to conduct research on children (Baldwin et al., 2019; Newbury et al., 2018; Reuben et al., 2016).

There is a growing evidence base for neurological evidence underpinning behavioural outcomes (Kraaijenvanger et al., 2020; Kumsta et al., 2017) which has culminated in McCrory et al.'s (2017) model of latent vulnerability. This model interlinks different evidence bases and proposes four neurocognitive systems that are altered because of early adversity. Maltreatment causes neurocognitive alterations within the systems of threat processing, reward processing, emotion regulation (ER) and executive control domains that are thought to reflect a latent vulnerability for negative outcomes like psychopathology. In other words, when children are in a maltreating environment, they develop coping strategies within these systems to survive which are adaptive in the maltreating environment. However, when the same children are removed to a non-maltreating environment, these strategies may no longer be adaptive and can make them vulnerable for later psychopathology (Gerin et al., 2019). For example, being hypervigilant to threat may have been

adaptive in a maltreating, high-threat environment but the same hypervigilance to threat in a school, or alternative caregiving environment, may interfere with attention to cues of positive feedback and elevated emotional reactivity deemed inappropriate to the context. These behaviours are associated with psychopathology risk (Busso et al., 2017). It follows that experiences following maltreatment, for example, alternative caregiving, could reduce the risk of negative outcomes. The process by which this occurs is multifaceted and is substantially contributed to by positive child-caregiver relationships which help with 'recalibrating' the four systems altered by maltreatment (McCrory et al., 2017).

Globally, maltreatment is the main reason for children to become looked after by alternative caregivers and the majority of looked after children in the UK are looked after due to abuse and neglect (Bentley et al., 2020). These alternative caregiving environments are recognised as protective factors that in some cases can diminish the risk of negative outcomes following maltreatment. Evidence of a more prosocial and healthy trajectory exists for maltreated children in foster care (Wade et al., 2019) and adoption (Fisher, 2015). This review will focus on the alterations to the ER system associated with maltreatment to better understand how latent vulnerability underpinned by difficulties with ER development is influenced by alternative caregiving.

2.1.1 Defining Emotion Regulation

Defining and measuring ER is widely debated (Cole et al., 2004; John & Eng, 2014). The individual variation in employment of ER strategies makes formation of a consistent definition challenging; there are a multitude of ways to regulate one's emotions. Crucially, the functionality of the behaviour needs to be considered. ER strategies are adaptive and relevant to the individual within the context. One of the early working definitions by Thompson (1994) defined ER as "the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals" (p. 27-28). However, understanding of ER has since developed and recent contributions from developmental and neurobiological psychology acknowledge the interconnectedness of emotional expression and ER that theorists had previously tried to separate (Stifter & Augustine, 2019). Gross's (2014) more contemporary process model distinguishes between antecedent and response-focused ER strategies that relate to strategies used before or after the experienced emotion to account for modulation that can occur at any point on the timeline of progression of emotional response. ER strategies are therefore identified and distinguished according to their timing and influence on emotion expression with different strategies being more or less appropriate and helpful depending on the saliency of the event (Gross, 2014; Stifter & Augustine, 2019).

There is unavoidable variability in how ER is measured for research purposes. For example, ER can be measured through use of questionnaires assessing type and frequency of ER strategies, or though observation approaches using coding frameworks to assess intensity and frequency of strategies in dysregulation-provoking scenarios. It can be examined at multiple levels including genetic (e.g. Hariri & Holmes, 2006), neurobiological (e.g. Kraaijenvanger et al., 2020; McLaughlin et al., 2015), behavioural, cognitive, and social domains (see Adrian et al., 2011 for a review). Subjectivity also plays a role in assessing ER because there are pre-determined views, inextricably linked with sociocultural factors, on what constitutes adaptive and maladaptive ER strategies (Eisenberg & Spinrad, 2004). As a multi-faceted system, comparing and contrasting studies which use ER measures poses challenges because the measures used may not be measuring the same aspect of the ER construct. To determine and impose a level of 'successful' ER requires acknowledgment of the emotion being regulated to achieve a goal. Many observational methods therefore code for the emotion itself (positive, negative, anger etc.) and the regulatory strategies employed are considered in relation to the emotion they are trying to modulate. This involves an appraisal of the environment and social referencing. Temperament, goals, environment, and stage of development are factors which are inextricably linked and must be controlled for experimentally where possible or considered within the operationalisation of ER (Stifter & Augustine, 2019). There are also skills implicated in the development of ER such as social and emotion understanding and emotion recognition (Luke & Banerjee, 2013) that underpin more successful ER. These must also be considered within the ER conceptualisation as difficulties in these other, associated areas of development can be targeted to support ER development. For this review a broad understanding of ER was applied to ensure inclusion of a wide variety of studies. The author determined that the ER measures used needed to assess aspects of regulation beyond the expression of a specific emotion.

2.1.2 ER and Maltreatment

In line with McCrory et al.'s (2017) model of latent vulnerability, maltreatment alters children's thresholds for emotional stimuli thereby altering the emotional impact and corresponding ER strategies required to regulate oneself. For example, research suggests maltreated children develop a lower threshold for negatively valanced information resulting in sensitivity and vulnerability to negative emotion-inducing events (Pollak et al., 2005). In line with other areas of developmental delay resulting from maltreatment, it follows that ER deficits would be apparent in maltreated samples compared with non-maltreated samples (Maughan & Cicchetti, 2002; Milojevich et al., 2020; Thurston et al., 2018). There are two reasons for this. Firstly, maltreatment negatively impacts development of ER (Heleniak et al., 2016; Lavi et al., 2019; Shackman & Pollak, 2014).

Secondly, ER difficulties contribute to psychopathology (Compas et al., 2017) and maltreated children are likely to have difficulties in this and related social and emotional domains (Kim & Cicchetti, 2010; Shields, Ryan, et al., 2001). The argument follows that ER development is of significance to maltreated children and could be an important protective factor against negative outcomes (Milojevich et al., 2019).

A crucial factor inextricably involved in these associations is parenting. In line with parental socialization theories (Eisenberg et al., 1998; Hoffman, 1983), positive parenting practices, for example modelling and provision of opportunity to practice effective ER strategies, exposure to appropriate emotional language, parental validation, and positive cues (Luke & Banerjee, 2013; Morris et al., 2017; Thomsen et al., 2017), and attachment (Gresham & Gullone, 2012; Mikulincer & Shaver, 2019) play an important role in ER development. The opposite is found in relation to negative parenting styles. For example, authoritative and harsh parenting is associated with interrupted and negative ER development (Chang et al., 2003; Chodura et al., 2021). In light of this knowledge, it is surprising that literature pertaining to maltreated children's ER development following placement in alternative care provision has not been explored systematically.

2.1.3 Sensitive Developmental Periods

Research relating to sensitive developmental periods is pertinent to this topic. Consideration of dose-dependent and time-dependent effects of maltreatment on outcomes offers an indication of timepoints whereby maltreatment has its strongest and most potent impact on development. Catch-up effects and the role of protective factors such as alternative caregiving may well differentiate maltreated children from one another depending on the timing. Maltreatment can accelerate or delay development during sensitive periods and is therefore more likely to have a lasting impact following these critical periods (Nelson & Gabard-Durnam, 2020). For example, middle childhood has been proposed as a vulnerable period for negative ER outcomes (Dunn et al., 2018). Coincidentally this overlaps with the developmental switch in frontoamygdala brain activity that underpins crucial ER circuitry development (Gee, 2016). The best opportunity for alternative care to be protective is during infancy because of its malleability and it being a time when other related skills are being developed, such as executive functioning, that can reinforce ER development (Stifter & Augustine, 2019). Considering ER shows development and sophistication over time (Cole, 2014; Gross, 2014) there are several sensitive developmental periods that could be directly or accumulatively impacted by maltreatment. Gross's (2014) antecedent-focused ER strategies are developed in later childhood and work to inhibit emotion expression as needed; they require self-regulation, attentional and reappraisal capacities. The response-focused strategies are developed from infancy where response

modulation to change the emotional experience is evident through strategies like self-soothing. There are also effects of ER development on development in other domains. Difficulties or delay with developing ER is linked with problems with social functioning (Kim & Cicchetti, 2010; Luke & Banerjee, 2013) academic achievement (Graziano et al., 2016; Raver, 2003; Shields, Dickstein, et al., 2001) and emotional or mental health (Compas et al., 2017; Eisenberg et al., 2010; Kim & Cicchetti, 2010; Zeman et al., 2006). Therefore, it is important for research to explore a variety of timings, durations, types and number of maltreatment exposures across the lifespan to understand when and how alternative caregiving can be most beneficial.

2.1.4 Influence of Alternative Caregiving Following Maltreatment

Resilience research highlights the opportunity to thrive despite adversity and in doing so recognises the strengths and capacity for change those survivors of maltreatment possess. Research focusing on protective and resilience factors must be considered alongside maltreatment research. Their interrelationships locate support mechanisms to mitigate the negative impacts of maltreatment (Fritz et al., 2018; Oshri et al., 2019; Rutter, 2006). A child's environment impacts and interrelates with their development. Factors like maltreatment type, severity and duration (Thurston et al., 2018), and placement stability (Johnson & Tottenham, 2015; Konijn et al., 2019) are also influential in determining the impact on outcomes. Parenting is a key mechanism by which maltreatment relates to child outcomes. ER has clear and established associations with parenting (Morris et al., 2017). In addition to environmental factors ER is also influenced by neurobiological factors. Individual differences in ER capacities can be identified within brain activity patterns (Berkman & Lieberman, 2009; Goldsmith & Davidson, 2004; Lewis & Stieben, 2004). There is also evidence of genetic heritability that interplays with key environmental factors such as early child-caregiver relationships (Kochanska et al., 2009).

'Catch-up' effects have been found within alternative caregiving contexts. Meta-analyses have found that children who were adopted following early adversity made progress in different developmental domains relative to peers who were not taken into care and remained exposed to institutionalisation (Van IJzendoorn & Juffer, 2006). For some domains, including height and IQ, adopted children caught up to such an extent that they were comparable to typically developing children (Van IJzendoorn & Juffer, 2006). Whilst research comparing those with and without a history of maltreatment and subsequent alternative care often find a statistically significant group difference in favour of the non-maltreated samples on a variety of developmental domains, the clinical significance of this is sometimes negligible further supporting the notion of catch-up effects via the mechanism of alternative care arrangements (Goemans et al., 2015; Kjelsberg & Nygren,

2004; McGoron et al., 2012). The extent to which ER can demonstrate catch-up effects within the maltreatment literature is limited. It seems unlikely that a full catch-up effect for ER would be evident because of the lack of evidence in related areas. For example, non-maltreated children are more often securely attached than adopted children, although adopted children tend to be more securely attached than non-adopted peers (Van IJzendoorn & Juffer, 2006). Persistent vulnerabilities with heightened behaviour and psychological difficulties are also evident in adopted (O'Connor et al., 2018; Vorria et al., 2006; Wade et al., 2019) and children residing in foster care with experiences of maltreatment (Humphreys et al., 2015).

ER is a critical skill known to underpin several other developmental domains that contribute to later outcomes (Eisenberg et al., 2010; Stifter & Augustine, 2019). This makes it a domain worthy of further consideration to determine the way in which alternative caregiving arrangements protect against negative outcomes and possibly contribute to 'catch-up' effects. The ways in which alternative care can influence ER is complicated and influenced by other factors. For example, there is disagreement on whether certain types of arrangements are more beneficial than others. Some argue that remaining with relatives (e.g. kinship care) is associated with more positive child outcomes than being placed in foster care (Washington et al., 2018). Other research suggests that the benefit is actually down to the quality of parenting and caregiving received irrespective of the type of caregiving arrangement (Anthony et al., 2019; Chodura et al., 2021; Speidel et al., 2020; Wu et al., 2020).

2.1.5 Current Study

ER is a crucial part of socioemotional development. In non-maltreated populations skills relating to ER contribute to positive outcomes and social success (Stifter & Augustine, 2019). It is one of the four systems identified in McCrory's (2017) model of latent vulnerability that is altered because of maltreatment and acts as a mechanism for subsequent negative outcomes. The reason for this is that ER is heavily influenced by caregiving factors. It is an important psychological domain to understand within maltreating and alternative caregiving contexts as it has a crucial role in determining developmental trajectories for maltreated children. It is important to understand the ways that alternative caregiving can benefit ER and in doing so potentially prevent and protect against negative outcomes. To date the literature is limited in understanding how alternative caregiving influences ER following maltreatment experiences. The aim of this systematic review is to better understand how ER is impacted by maltreatment and explore the role of subsequent alternative caregiving arrangements in its development. It seeks to answer the question: Do

maltreated children's ER skills differ from non-maltreated children's and what is the role of alternative caregiving?

2.2 Method

2.2.1 Protocol and Registration

The study protocol was registered with Prospero (CRD42020204335), and it is accessible from: https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=204335.

2.2.2 Inclusion/eligibility Criteria

A PICOS approach was used (see Appendix A). Participants needed to be children and young people (CYP) ranging from birth to 25 years old because in the UK the Children and Families Act (2014) outlines a system of support for CYP from birth to 25 years of age. The research needed to include and compare at least two groups of CYP on the key outcome measure of ER. One group was required to have a history of postnatal adversity, in line with Leeb et al.'s (2008) maltreatment definition previously mentioned, or have experience of institutionalisation (van IJzendoorn et al., 2011), *and* be living in an alternative care setting to the one they were born into (including foster care, adoption, kinship care, legal guardianship etc.). The other group may or may not have experienced postnatal adversity *and* were required to remain living with their biological families. Papers needed to include categorisation of maltreatment using a specific measure or classification system. This ensured that exposure to situations like parental traumatic brain injury or mental health difficulties was not conceptualised as maltreatment. Studies including *currently* institutionalised children were excluded. The key outcome required to be included was a quantitative measure of emotion (dys)regulation or of a specific cognitive or behavioural (mal)adaptive strategy implicated in ER such as cognitive reappraisal and effortful control (Gross, 2014). A classification of caregiving setting was also required. Qualitative, case study and population studies were excluded.

2.2.3 Search Strategy

An initial search for all articles relevant to the review was conducted using *PsycINFO, Web of Science, PubMed,* and *ERIC* electronic databases in September 2020. In addition to bibliographic databases the search included hand-searching the reference lists for included papers and reviewing grey literature on *Social Care Online* and *ProQuest* databases. A search on *ProQuest* was integrated through searches on larger databases.

The review was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Liberati et al., 2009). The search terms used included ("Emotion* regulation" OR "emotion* dysregulation" OR "affect regulation" OR "affect dysregulation" OR "mood regulation" OR "mood dysregulation" OR "Self-regulation of emotion*" OR "affect management" OR "emotion* self-regulation") *AND* (abuse OR neglect OR trauma OR advers* OR institutionali*ation OR post- institutionali*ed OR maltreatment OR adopt* OR "foster care" OR "foster-care" OR "high risk" OR "high-risk") *AND* (parent* OR care-giver OR caregiver OR "natural mentor" OR non-primary care-giver OR non-primary caregiver OR nonprimary care-giver OR nonprimary caregiver OR teacher OR coach OR kinship care* OR legal guardian*).

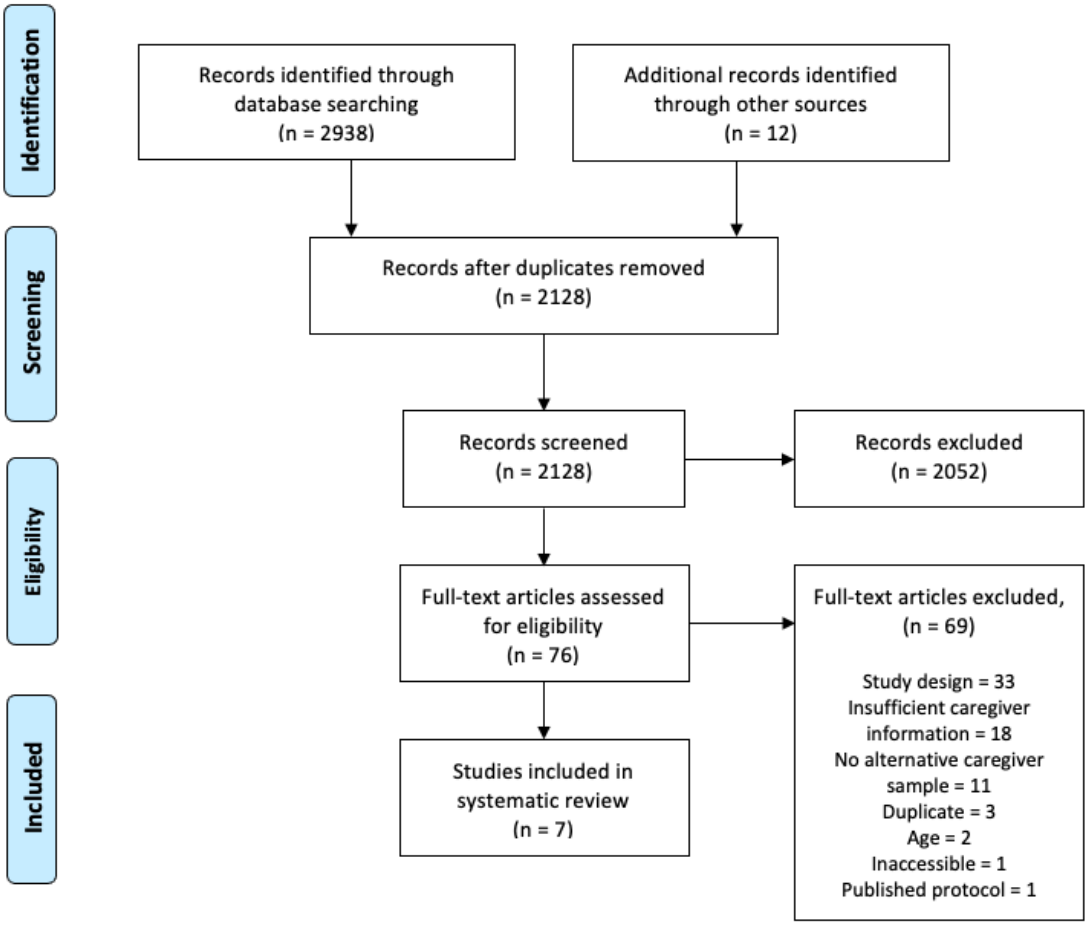
The search terms were searched in title and abstract fields of the bibliographic databases. Whilst no data restrictions were applied the databases have default date ranges within which they search (i.e., *PsycInfo*: 1934-2020; *ERIC*: 1966-2020; *PubMed*: 1972-2020; *Web of Science*: 1970-2020).

The database and grey literature search provided a total of 2,950 citations. After adjusting for duplicates 2,133 titles and abstracts were screened. Of these, 2,052 studies were discarded for not meeting the inclusion criteria. Therefore 76 papers were included in the full-text screening. Excluded papers at this stage were grouped according to reasons for omission (see Figure 1). A total of 7 studies met the inclusion criteria. The search was re-run in July 2021 which resulted in approximately 100 extra studies to consider. Of these extra papers only one met the inclusion criteria resulting in a total of eight studies to be included in this review. Figure 1 outlines the PRISMA process applied prior to re-running the search.

Figure 1

PRISMA Flow Diagram for Screening and Selection

Language restrictions were not implicated in the original database search. All papers had



English abstracts available to be considered in the initial screening. Translation support when considering inclusion of papers was sought during the full-text screening phase. University of Southampton faculty members and personal contacts were able to aid with translating five of the six papers not in English (including those in French, Italian, Chinese, Hungarian and German) of which four were subsequently excluded. One paper (Bardyshevskaya and Trenina, 2008) was unable to be accessed for translation despite multiple attempts to contact the author, journal and affiliated institution. Three studies were excluded because they were theses versions of later-published papers, considering them as duplicates. Some papers incorporated ER measures into composite or profiles for cluster analyses (e.g. Pears et al., 2010, 2015). In these instances, authors were contacted twice to request access to data pertaining to the specific ER measure of interest.

2.2.4 Study Selection

Rayyan, a web-based systematic review software was used to facilitate the initial title and abstract screening process (Ouzzani et al., 2016). Full-text articles were screened in Mendeley, a reference management software (Singh, 2010). An undergraduate Voluntary Research Assistant (VRA) assisted with co-screening the database search results at all stages. They were blinded to the author's categorisation of inclusion and exclusion on Rayyan. Disagreements were resolved by discussion until consensus was reached.

2.2.5 Data Extraction

The author conducted data extraction for the eight included papers. Data retrieved included publication details, country where study was conducted, methodological and participant characteristics such as sample size, study design, ages, gender distribution, outcome measure (of ER and maltreatment) and key findings relating to these outcomes. This information is outlined in Tables 1 and 2.

2.2.6 Study Quality Ratings

Included studies were evaluated using the STROBE quality assessment tool (von Elm et al., 2014) to determine the extent to which their design, procedure and reporting is rigorous and has relevance to the research question. Each item on the primary study checklist was rated (yes = 1, no = 0) in terms of whether the authors followed the recommendations. A maximum of 22 points could be scored. In line with da Costa et al. (2011)'s recommendations of appropriate usage of the STROBE checklist, higher scores indicate a higher level of conformity to the STROBE statements and there are no available cut-offs. The STROBE tool has been applied in this way in other systematic reviews (see for example Secinti et al. 2017). All included papers achieved at least 50% on the STROBE checklist. The maximum score was 79% (Koss et al. 2020) and the minimum was 53% (Delaville & Pennequin, 2020; Norris, 2006).

Table 1

Sample Characteristics of Included Studies

Author	Total			Characteristics by Group					
				Alternative Caregiving Setting			Comparison (Control) Caregiving Setting		
	N	Sex (girls, boys)	Avg. Ages	Type of Caregiving (N,percent of total)	Sex (girls, boys)	Avg. Ages	Type of Caregiving (N, percent of total)	Sex (girls, boys)	Avg. Ages
Batki (2017)	90	40, 50	58.32 ± 6.65 m	Adoption; PI (30, 33%)	16, 14	57.77± 6.9m	Adopted from birth (30, 33%) and biological (30, 33%)	Adopted from birth (16, 14); Biological (15, 15)	58.07 ± 6.52m and 59.13±6.59 m
Delaville & Pennequin (2020)	221	111, 110	7 to 16y	Foster Care (106, 48%) comprised of 34 single placement; 57 multiple placement; 15 mixed placement experiences.	Single placement: 53%, 47% Multiple placement: 47%, 53% Mixed placement: 40%, 60%	Single placement: 10.5 ± 2.6y Multiple placement: 11.5 ± 2.7y Mixed placement: 12.9 ± 3.3y	Biological NM (115, 52%)	48%, 52%	11.6 ± 2.8y
Koss et al. (2020)	145	79, 66	T5: 61.68m	Foster Care (93, 64%)	57%, 43%	T5: 61.54±1.68m T6: 71.72±3.36m	Biological (52, 36%)	50%, 50%	T5: 61.91±1.89m T6: 71.30±3.07m

			T6: 71.55m						
Labella et al. (2020)	211	100, 111	27.8 ± 5.4m	Foster Care (91, 43%)	48.4%, 51.6%	29.5m	Biological Maltreated (120, 57%)	46.7%, 53.3%	26.5m
Norris (2006)	51	51, 0	5 to 6y	Adoption, PI (25, 49%)	100%, 0%	n.r.	Biological (26, 51%)	100%, 0%	n.r.
Perry et al. (2019)	296	174, 122	7.08 to 15.12y	Adoption; PI (124, 42%)	84, 40	11.29 ±2.38y	Biological (172, 58%)	90, 82	11.17 ± 2.29y
Robinson et al. (2009)	123	47%, 53%	12 to 47m (avg. 32.6m)	Foster Care (66, 54%)	42.4%, 576.6%	31.17 ± 9.71m	Biological NM (57, 46%)	52.6%, 47.4%	34.48 ± 11.85m
Waizman et al. (2020)	94	58.5%, 41.5%	9 to 17y	Adoption; PI (36, 38%)	63.9%, 36.1%	14.48y	Biological (58, 62%)	55.2%, 44.8%	13.24y

Note. Exact *N* reported for different sexes where possible. Where this was not possible, percentages of sample are provided.

m = month(s); y = year(s); PI = previously institutionalised; NM = non-maltreated; n.r. = not reported

Table 2

Methodological Characteristics of Included Studies

Author	ER Measure	Maltreatment Measure	Summary of Findings	Location	QA % (STROBE rating)
Batki (2017)	Coded children's narratives in MacArthur Story Stem Batteries (Bretherton & Oppenheim, 2003)	Institutionalisation	The PI group demonstrated significantly less ER: lower narrative coherence, greater dysregulated aggression themes and greater interpersonal conflict themes than the control group.	Hungary	58.82
Delaville & Pennequin (2020)	Child-report Kidcope Scale (Spirito et al. 1988), French version (Djo, 2013; Dumont & Plancherel, 2001) - Emotional Outburst and Relaxation items	Victims of physical, emotional, sexual abuse and/or neglect and deprivation	There were n.s. differences between the control group and all foster groups on the Emotional Outburst and Relaxation subscales of the Kidcope questionnaire.	Canada	52.94
Koss et al. (2020)	Multi-informant (caregiver, teacher and researcher rating of observation in class) ERC (Shields & Cicchetti, 1997) – Lability / Negativity subscale.	Institutionalisation	The PI group had significantly lower ER: higher scores on parent-report, teacher-report and observer-report ERC.	MN, USA	79.41

Labella et al. (2020)	Coded child behaviour in Tool Task (Matas et al., 1978) on negative affect dysregulation and adaptive regulation scales.	Families involved with CPS due to maltreatment concerns (e.g., allegations of child abuse and neglect and/or the presence of established risk factors)	Significant differences were found in the comparison intervention programme group only. Maltreated children remaining with their birth families had significantly greater anger dysregulation and lower adaptive regulation than children living in foster care.	NE USA	76.47
Norris (2006)	Child's behaviour in Disappointing Present Task (Saarni, 1984) coded for nonverbal and verbal responses in 3 categories of behaviour: positive, negative and transitional. Scores inferred for latency and intensity.	Institutionalisation	There were n.s. differences between the groups on positive and negative latency, intensity of positive responses and number of transitional responses. The biological group had significantly greater intensity of negative responses than the adoptive group.	Chicago, IL	52.94
Perry et al. (2019)	Parent-report ERC (results n.r.) and Trier Social Stress Test (TSST-M; Buske-Kirschbaum et al., 1997) positive engagement composite (positive expressivity and social engagement).	Institutionalisation.	Group was a n.s. predictor of ER with n.s. group differences. The group by age interaction was a sig. predictor of ER such that the PI group had sig. lower ER than the control group for participants aged 13 years and older.	MN, USA	63.23
Robinson et al. (2009)	Coding for intensity and frequency of positive affect and anger in parent-child interaction task.	Barnett et al.'s (1993) classification system used to evaluate clinical case files of children in CPS.	The foster group had significantly lower ER (indicated through lower positive affect intensity) than the control group.	parish (county) surrounding a large, urban southern city	58.82
Waizman et al. (2020)	Self-report ERQ-CA (ER Questionnaire for Children and Adolescents) adapted from Gross and John (2003)	Institutionalisation	The PI group scored significantly higher on the expressive suppression subscale of the ERQ-CA.	Los Angeles, CA	70.59

Note. PI = previously institutionalised

2.3 Results

2.3.1 Publication Details

None of the included studies took place in the UK and only one (Batki, 2018) took place in Europe. The majority of the included studies took place in the USA where there are different protocols and legislation surrounding child protection relating to maltreatment and subsequent adoption. Furthermore, there is more international adoption in the USA than in the UK, although there has been a decline in international adoption generally in the past 20 years (Mignot, 2015). Two papers included international adoptees (Koss et al. 2020; Norris, 2006; Perry et al. 2019) and consideration of cultural factors is particularly pertinent in these contexts and will be discussed later.

The majority of the included studies were published in the last 5 years (Batki, 2018; Delaville & Pennequin, 2020; Koss et al., 2020; Labella et al., 2020; Perry et al., 2019; Waizman et al., 2020) with the oldest being published 15 years ago (Norris, 2006).

2.3.2 Participant Characteristics

Seven out of the eight studies compared maltreated children living in alternative care with non-maltreated samples living with their biological families (Batki, 2018; Delaville & Pennequin, 2020; Koss et al., 2020; Norris, 2006; Perry et al., 2019; Robinson et al., 2009; Waizman et al., 2020). One study compared maltreated children living in alternative care with those remaining with their maltreating, biological caregivers (Labella et al., 2020). Robinson et al. (2009) included the biological parents of the maltreated children, rather than their foster caregivers, in the ER measure. Therefore, their study is better described as a comparison between maltreated and non-maltreated children's behaviours in an interaction with their biological caregivers.

Two papers involved comparisons across multiple subgroups. Batki (2018) conducted a three-way group comparison between children in alternative care with and without a history of maltreatment, and non-maltreated biological groups. Delaville and Pennequin (2020) compared multiple foster-care groups, distinguished by their foster placement history, with a non-maltreated biological comparison. All other papers compared two groups of children as outlined above.

The studies spanned children of different ages and developmental periods. Five studies assessed children's ER skills between 2 and 6 years of age, accounting for a group of children who have none or little experience of school. Labella et al. (2020) and Robinson (2009) assessed

the youngest children, approximately 2 years of age, and Batki (2017), Koss et al. (2020), and Norris (2006) assessed children between 4 and 6 years old. The other three studies assessed ER skills in larger age ranges from 7 (Delaville & Pennequin, 2020; Perry et al. 2019) or 9 years old (Waizman et al., 2020) to later adolescence (15 to 17 years old).

All adoptees across the studies were previously institutionalised (PI) and all but one (Batki, 2018) involved international adoptees. In studies using adopted children the age of adoption ranged from 5 to 57 months old with average ages ranging from 12 to 25.17 months. Notably, the range of ages at adoption in Waizman et al.'s, (2020) participant group ranged from 0.13 months suggesting the youngest children had limited exposure to institutionalisation, but the average age at adoption in this study was 14.84 months so there was sufficient variability within the sample. Some adopted children had previous experience of foster care (Norris, 2006). Earlier adoption did not appear to contribute to enhanced ER outcome because in all but one study (Norris, 2006) there was an ER deficit found in maltreated adopted children.

There was a greater variety of ages at which children entered foster care in the other studies. Both Labella et al. (2020) and Robinson et al. (2009) included participants who were in early childhood when taken into care (*M* = 6.6 months in Labella et al. 2020; details not reported in Robinson et al. 2009). Contrastively, Delaville and Pennequin (2020) included three types of foster care arrangements, some of which who had intermittent returns to their biological caregiver. Approximately 50 percent of the sample were between birth and 5 years old when they entered care. At the time of the ER measurement there was variety in the ages of participants and the amount of time in care. Participants in Robinson et al.'s (2009) paper had spent the least amount of time in care (*M* = 6.87 months) compared to ranges of eighteen months to 3.5 years (Labella et al., 2020) and four to sixteen years (Delaville & Pennequin, 2020). Considering only three studies included children in foster care, and there is great variability in other aspects of the methodology as will be discussed later, it is difficult to draw conclusions.

2.3.3 Main Effect of Maltreatment and Subsequent Alternative Caregiving on ER

Overall, there was an even spread of evidence among the included studies of significant and non-significant impacts of maltreatment and subsequent alternative caregiving on ER. Four studies (Batki, 2017; Koss et al., 2020; Robinson et al., 2009; Waizman et al., 2020) found evidence of ER deficits following maltreatment despite transition to alternative caregiving. The majority of these (Batki, 2017; Koss et al., 2020; Waizman et al. 2020) used a sample of post-institutionalised (PI) adoptees and Robinson et al. (2009) used a sample of children in foster care. Perry et al. (2019) found a similar pattern of results but did not reach statistical significance. Delaville and Pennequin (2020) found mixed and non-significant results dependent on foster care

experience. Two papers found results that suggest alternative caregiving arrangements following maltreatment can benefit ER development (Labella et al., 2020; Norris, 2006).

In summary, the majority of the studies highlight greater difficulties with ER following maltreatment within an alternative caregiving context compared to non-maltreated children. Nonetheless there are two studies which identify that alternative caregiving can be beneficial. In the case of Norris (2006), the benefit was so great that ER in the maltreated sample was superior to that of non-maltreated biological controls. Labella et al.'s (2020) paper further corroborates the benefits of alternative caregiving by demonstrating how children in these settings perform better on ER measures than children who remain in a biological maltreating environment. An examination of the methodological differences between studies could account for the differences in results among the papers. The papers differed in relation to the assessments used (of maltreatment and ER) and the type of alternative caregiving arrangements (foster care or adoption).

2.3.4 Maltreatment Assessment

Maltreatment was primarily inferred from qualitative descriptions of experiences outlined in the studies or through the inclusion of PI samples. For example, papers provided descriptions of the maltreated sample as "victims" or offered summaries of the reasons for involvement with child protective services. Only one paper (Robinson et al. 2009) used a standardised classification system. These results exemplify the variability and difficulty in assessing maltreatment in a standardised way (Chandan et al., 2020; Huffhines et al., 2016). The author hoped to compare studies according to factors relating to maltreatment such as type, timing, duration and frequency of exposure considering literature suggesting related variation in outcome (Elton et al., 2014; Rutter, 1998). Unfortunately, there was insufficient detail in the included papers to allow this. Elsewhere, in Labella et al. (2020), there was a risk that the impact of maltreatment was confounded through the inclusion of children exposed to parental substance abuse and homelessness, which were not part of the inclusion criteria. However, the study was included because the reason for transition to alternative care related to maltreatment.

2.3.5 Alternative Care Settings: Adoption Studies

Five papers compared PI adoptees with non-maltreated children living with their biological families (Batki, 2018; Koss et al., 2020; Norris, 2006; Perry et al., 2019; Waizman et al., 2020). Three of the five papers found significant effects of maltreatment (institutionalisation) on ER such that there were greater ER deficits within the maltreated samples (Batki, 2018; Koss et al. 2020; Waizman et al. 2020). Perry et al. (2019) found non-significant group-level differences overall but

did find an age by group interaction highlighting significant group level differences consistent with the above findings for children aged 13 years and older. In contrast, Norris (2006) reported that their comparison group, composed of non-maltreated children living with their biological families, demonstrated significantly greater ER deficits than PI adoptees. Whilst this is suggestive of adoption being a protective factor that can make such an impact that maltreated children can outperform non-maltreated children on ER measures, there were several limitations within Norris's (2006) study. Noteworthy is that in Norris's (2006) study, the adopted group were drawn entirely from a Chinese sample whereas the other studies used international or European adoptee samples. Many of the ER assessment tools, including the 'Disappointing Present Task' (Kinsey & Schlösser, 2013) used in Norris (2006) were standardised for use in western samples and therefore may not have been appropriate for their sample. Furthermore, Norris (2006) had the smallest sample size (N = 51) suggesting a lack of power.

2.3.6 Alternative Care Settings: Foster Care Studies

The three papers that used a sample of children living in foster care also had mixed results. The papers compared children in foster care with a history of maltreatment with non-maltreated (Delaville & Pennequin, 2020; Robinson et al. 2009) and maltreated (Labella et al. 2020) biological controls. Robinson et al. (2009) found that maltreated children in foster care had substantially and significantly lower positive affect intensity (η_p^2 = .15), one of two indicators of emotional dysregulation in their behavioural measure. A similar deficit was evident in the other aspect of their ER measure, anger intensity, with group differences approaching significance but a comparatively smaller effect size (p < .10, η_p^2 = .03).

All three studies compared children in foster care to biological controls but Labella et a (2020) differed with respect to the specific comparisons made. Labella et al. (2020) compared two maltreated samples whereas Delaville & Pennequin (2020) and Robinson et al. (2009) compared maltreated children in foster care with non-maltreated children living with their biological families. Another difference is that Delaville and Pennequin (2020) divided their maltreated sample residing in foster care into three groups to distinguish between foster placement experiences: the single placement group included children who remained with the same foster carer, the multiple placement group consisted of children who experienced changes in foster caregivers and the mixed placements group included children who had transitioned between different foster caregivers and their biological family. They used a coping questionnaire which included two measures of ER: Emotional Outburst and Relaxation and reported non-significant differences between all foster groups and the comparison (non-maltreated) group on these aspects of the questionnaire.

Labella et al. (2020) highlighted how foster care contributes positively to maltreated children's ER in their comparison of two maltreated samples. They reported that children who lived with their biological parents in a maltreating environment had significantly greater anger dysregulation and lower adaptive regulation than children with a history of maltreatment living in foster care. However, the beneficial effect of foster caregiving was only present for those families (foster and biological) participating in an intervention called Developmental Education for Families (DEF). Furthermore, the difference in ER between the maltreated biological and foster care groups became non-significant when excluding those children who had returned to their biological caregiver at the time of the ER assessment. This suggests that intervention programs to promote children's development can be as beneficial for some children's ER development as residing in foster care. Their findings encourage a mixed approach to supporting maltreated children whereby biological families are supported whilst children are in alternative care to ensure that reunification is successful and further harm is prevented.

2.3.7 Outcome Measure

In addition to alternative care settings explored in the studies, another area of difference is the conceptualisation and operationalisation of ER. A variety of measures were used to assess ER from established and standardised questionnaire responses (e.g., Emotion Regulation Checklist (ERC); Shields & Cicchetti, 1997) to behavioural coding systems of children's behaviours in independent or joint parent-child activities. The methods used to assess ER could account for differences in findings.

Three studies used behavioural measures of the child participant (Batki, 2018; Norris, 2006; Perry et al. 2019) and two studies observed children's behaviours in an interaction with their caregivers (Labella et al., 2020; Robinson et al. 2009). Four studies used questionnaire measures (Delaville & Pennequin, 2020; Koss et al., 2020; Perry et al., 2019; Waizman et al., 2020) however Perry et al. (2019) do not report the results of the parent-report ERC.

2.3.8 Coding during Parent-Child Interactions

Robinson et al. (2009) and Labella et al. (2020) used behavioural measures to compare children in the context of interactions with their biological parents. They reported substantial effect sizes in support of a negative impact of maltreatment. They both assessed ER by coding for intensity of adaptive (positive) and anger affect and associated regulation behaviours during a parent-child interaction task. Both studies found greater dysregulation in maltreated children's interactions with their biological caregivers compared with maltreated children in foster care (Labella et al. 2020) and non-maltreated biological children (Robinson et al. 2009). Labella et al.'s

(2020) paper suggests there is a difference in how maltreated children behave in the presence of the parent whom they lived with when maltreated compared with their foster caregiver. Robinson et al. (2009) did not assess children's interactions with their foster caregivers, instead relying on a comparison of maltreated (who resided in foster care) and non-maltreated children's behaviours. These papers would have been improved through combining approaches such that they include comparisons across multiple contexts and include interactions between maltreated children and their biological caregivers so that the benefit of foster care can be more clearly defined. Together these studies suggest that foster caregiving does play a role in protecting against ER deficits, as measured in caregiver-child interactions, but cannot eradicate the negative consequences of early maltreatment when compared to non-maltreated controls.

2.3.9 Coding During Child Task

Three papers measured ER through assessment of child behaviour in an independent activity (Batki, 2018; Norris, 2006; Perry et al., 2019). This included observing children's reactions to and use of regulatory-associated strategies in stress-inducing (Perry et al. 2019) or disappointment-inducing (Norris, 2006) situations or assessing content and form of a child's narrative (Batki, 2018). Batki (2018) reported that PI adoptees used statistically significantly less regulatory behaviours than biological controls and Perry's (2019) paper had similar but overall non-significant results. Norris (2006) found the opposite, with biological controls expressing significantly more intense negative responses in the ER task. Notably, there were non-significant group differences on all other ER measures used in Norris (2006) which suggests that the significant group difference on this specific aspect of the ER measure could be due to other factors, like culture, previously mentioned. Perry et al. (2019) found significant group differences that were only apparent in a small subgroup of their sample, that is, children aged 13 years and older. Although the inferences that can be drawn from their work is limited their study does benefit from a significant intercorrelation between their behavioural and questionnaire (parent-report ERC) assessments of ER despite not reporting group-level differences on the ERC itself; this validity of measures inferred through intercorrelations is not apparent in Norris (2006).

2.3.10 Questionnaires

Four studies used questionnaire measures (Delaville & Pennequin, 2020; Koss et al., 2020; Perry et al., 2019; Waizman et al., 2020). However, Perry et al. (2019) do not report the results of the parent-report ERC and instead focus on the results from their behavioural measure. Koss et al. (2020) used a series of multi-informant ERCs to compare ER between PI adoptees and age-matched biological controls. Their study was longitudinal, and the parent and teacher ERC data

was collected at least two years after adoption and approximately 10 months before the observer-reported ERC was completed following an observation of the child in kindergarten. Parent-report ERC significantly correlated with both other informants in the PI group only. There were also significant correlations between the researcher and teacher-reported ERC scores in both groups. The PI participants consistently demonstrated greater ER difficulties across all informants' reports.

Delaville and Pennequin (2020) and Waizman et al. (2020) used child-report questionnaires. Delaville and Pennequin (2020) used the Emotional Outburst and Relaxation subscales of the Kidcope (Spirito et al. 1988) which is a questionnaire assessing coping strategies in response to stress, including ER. They reported non-significant group differences between three foster group types and biological controls. Waizman et al. (2020) used the ER Questionnaire for Children and Adolescents (ERQ-CA; Gross & John, 2003) which assesses two specific ER strategies: cognitive reappraisal and expressive suppression. Both studies used older participants with a large range of ages (7 to 16 years old) arguably making self-report questionnaires an appropriate measurement tool. Interestingly, only Waizman et al. (2020) reported significant group-level differences between their PI adopted and non-maltreated biological groups. Furthermore, they only found differences on use of expressive suppression whereas there were non-significant differences reported for the cognitive reappraisal indicator of ER. Delaville and Pennequin (2020) found non-significant differences between all four of their groups (three foster groups and one non-maltreated, biological group). This suggests that there could be a difference in results from child-report questionnaire measures of ER in adoptive and foster caregiving contexts but without further research it is not possible to substantiate this claim. The results from Waizman et al. (2020) are in line with Koss et al. (2020) and Batki (2017) suggesting comparability between child-report ERQ-CA, parent and teacher report ERC (Koss et al. 2020) and analysis of a child's narrative (Batki, 2017) in adopted samples.

All together the different methods of assessing ER across the studies yielded different and mixed results but it is hard to determine whether one particular measure is more or less accurate and effective than another considering the small number of studies. It is clear that for effective comparison, studies should incorporate multi-informants with reported intercorrelations and elicit children's views through child-report measures. Consideration of what aspects of ER are being assessed is also important to ensure that both regulatory and dysregulatory strategies are being equally considered so as to gain a better understanding of whether maltreated children's deficit relates to less regulatory and/or more dysregulatory strategies. It would also be worthwhile controlling for emotional experiences especially

considering evidence of maltreated children's sensitivity to and a lower threshold for managing negative emotions.

2.3.11 Maladaptive or Adaptive Strategy Usage

The studies used a few different approaches in their consideration of adaptive and maladaptive ER strategies. Seven of the papers included assessment of both and Koss et al. (2020) only explored ER deficits. The aspect of ER being assessed and exploration of specific results relating to the different aspects are informative. The papers which included both offer opportunity for further analysis. In some cases, the significant group-level differences were driven by a reduced number of adaptive strategies by the maltreated groups. For example, Perry et al. (2019) used a strength-focused coding scheme and coded for positive expressivity and social engagement in the Trier Social Stress Test (TSST; Buske-Kirschbaum et al., 1997). They reported that maltreated children aged 13 years and older demonstrated fewer of these adaptive ER strategies. Similarly, Robinson et al. (2009) found a significant group difference on the positive affect intensity aspect of their measure only, with the group-level difference in anger affect intensity approaching significance.

On the other hand, some papers found their results to be contributed to by the maltreated group demonstrating a greater number of maladaptive strategies. Contrastively to Perry et al. (2019) and Robinson et al. (2009), Norris (2006) found non-significant differences between groups on their positive latency and intensity measures and only found significant differences for the negative emotional aspects. Batki (2018) and Waizman et al. (2020) both found significant differences in their assessment of maladaptive strategies only. In the case of Waizman et al. (2020) they found maltreated children to use significantly more expressive suppression rather than using significantly less cognitive reappraisal, an adaptive strategy. Interestingly only one paper found significant group differences for both adaptive and maladaptive ER strategies (Labella et al. 2020). Labella et al.'s (2020) participant sample and methodology is unique though and their findings indicate that foster care contributes to positive changes so that the children in care are using more adaptive and less maladaptive strategies than their counterparts remaining in a maltreated environment. This suggests that alteration of ER strategies is possible over time and through provision of alternative caregiving, but that cross-sectional methodology prevents clear associations to be made.

Across all studies there were more significant findings indicating maltreated children used a greater amount of maladaptive ER behaviours rather than less adaptive ER responses. This suggests that group differences were attributed to by the maltreated group using more dysregulated responses rather than children in alternative caregiving settings using less prosocial,

regulated responses. Maltreated children in alternative care settings may use more dysregulated strategies than their counterparts and this could reflect their experiences of a greater amount of negative emotion such that adaptive strategies are not as effective for their regulation.

2.4 Discussion

This systematic review identified eight papers which explored the impact of adoption and foster caregiving on ER development in children with a history of maltreatment. Five of the studies focused on the impact of adoption following institutionalisation and three studies focused on the impact of foster care following other forms of maltreatment. Most studies compared two groups of children: maltreated children living in alternative care (adoption or foster care) and non-maltreated children living with their biological families. Whilst Robinson et al. (2009) applied this same methodology, their study differed in how ER was assessed because they involved the biological parent of the maltreated children residing in foster care, rather than the foster caregivers, in their ER measurement. Labella et al.'s (2020) methodology also differed to the others in their comparison of two maltreated groups of children, one group residing in foster care and the other residing with their biological families. Participant ages could be divided into two groups, with five studies including younger children between approximately 2 and 6 years of age, and three studies including an older age group spanning from 7 to 17 years of age. Age at adoption spanned, on average, between 12 and 25 months old. There was less detail pertaining to age of transition to foster care available in the relevant studies.

Overall, the majority (n=4) of the included studies affirm that maltreatment relates to difficulties with ER (Batki, 2017; Koss et al., 2020; Robinson et al., 2009; Waizman et al., 2020). Two studies (Delaville & Pennequin, 2020; Perry et al. 2019) reported non-significant group differences on the ER measures and another two studies reported results in the opposite direction such that children with a history of maltreating residing in alternative care scored higher on ER measures than non-maltreated (Norris, 2006), and in the case of Labella et al. (2020), maltreated, children remaining with their biological caregivers. Children who have experienced maltreatment and transitioned to alternative caregiving generally presented with difficulties with ER compared to non-maltreated children. Findings in six of the eight studies report that maltreated children in both adoption (Batki, 2018; Koss et al. 2020; Norris, 2006; Waizman et al. 2020) and foster caregiving (Robinson et al., 2009; Labella et al. 2020) arrangements differ from non-maltreated children in their ER strategy usage. All but one of these (Norris, 2006) reported that the non-maltreated biological group demonstrated significantly greater ER skills on a variety of measures; Norris (2006) reported findings in the opposite direction.. One study (Labella et al. 2020) showed that foster care can be a protective factor compared with remaining in a

maltreating environment in a context of parenting intervention programmes. There was a limited number of studies overall. They were inconsistent in their methodological approaches and had variability in participant ages and alternative caregiving experiences. These factors limit the conclusions that can be drawn from the studies. Further research in this area is clearly needed to allow for opportunity for replication and validation of findings.

The included papers had methodological differences which were considered in more detail to better understand and explain the different findings. Specifically, this review considered differences between studies investigating adoption and foster caregiving contexts because these were the only available contexts included in the review. Then, differences in ER measures were considered. There was more of a consensus that ER deficits were evident in maltreated children among studies with PI adopted children. In contrast, findings from studies with children in foster care were more mixed and dependent on other factors like foster care experiences. This is likely because all adoption studies included PI children. Institutionalisation is an extreme form of maltreatment and whilst it was not possible to compare the impact of institutionalisation with other forms of maltreatment there is literature supporting the finding of a more consistent deficit being present in PI adoptees (Sherr et al., 2017).

ER was assessed in the studies with behavioural and questionnaire assessments. The majority (*n* = 5) of studies assessed ER through behavioural or narrative coding systems (Batki, 2018; Labella et al., 2020; Norris, 2006; Perry et al., 2019; Robinson et al., 2009). Behavioural measures included assessment of children in interactions with caregivers or during a dysregulation-inducing activity they participated in independently. Due to the limited number of studies included in the review no substantial claims can be made as to the impact of different assessment methodologies. In particular, only two papers (Labella et al., 2020; Robinson et al., 2009) assessed regulation during caregiver-child interactions and both used different population samples, limiting the comparisons that can be made. Norris (2006) and Perry et al. (2019) used realistic scenarios to try and induce disappointment and stress, accordingly, to necessitate application of ER strategies. Neither found results supporting maltreatment contributing to difficulties with ER. This could suggest that these behavioural measures are less valid or reliable especially because they pose risk of assessor bias. However, there were apparent strengths in papers that included both questionnaire and behavioural assessments with intercorrelations validating their joint usage (Perry et al., 2019). Selection of the caregiver involved in the interaction is an important consideration for researchers because children behave differently in the presence of their biological and foster caregiver. To better understand the impact of alternative caregiving it would be advantageous to ensure this caregiver is prioritised in the interaction assessments rather than involving the biological caregiver. This is especially important

because the maltreated child may have had limited contact with the biological caregiver and may have even experienced maltreatment from or in the presence of them.

In addition to the variability of ER assessments among included studies, the content of the measure, linked with the operationalisation of ER, was also identified as an important factor that could account for different results. A strength apparent in all but one paper was that they used measures that considered children's use of both maladaptive and adaptive ER strategies, acknowledging both strengths and difficulties children can have with ER. There was a greater number of statistically significant findings reporting that maltreated children engaged with more maladaptive strategies than their non-maltreated counterparts. This is important because it indicates that maltreated children do not necessarily have a deficit in using adaptive strategies but instead that the group-level differences can be explained by maltreated children using more maladaptive strategies. Maltreated children appear to be more reliant on maladaptive strategies perhaps because they lack confidence or practice in effective use of adaptive strategies. This has implications for professionals, including researchers, working with maltreated children. For example, frequency of usage of maladaptive strategies could be a useful indicator of progress in ER development over time and in relation to any specific interventions used to support maltreated children. Interventions to support ER development in maltreated children should focus on supporting them to be more competent and confident in using adaptive strategies. Maltreated children would benefit from opportunities to observe and learn about the benefits of adaptive strategies through modelling in safe caregiving environments. This would typically be done in a typical caregiving context in line with parental socialization practices (Eisenberg et al., 1998; Hoffman, 1983) and is an experience maltreated children miss out on. These children will also need to feel safe physically, mentally and emotionally in order to use strategies that are different to their engrained responses resulting from their experiences of maltreatment.

Maltreated children have altered threshold or coping systems that cause less effective regulatory processes (McCrory et al., 2017) including recognition of emotions (da Silva Ferreira et al., 2014). Considering the role of emotion identification in the regulatory process (Luke & Banerjee, 2013), deficits in both areas make it difficult for maltreated children to manage dysregulation-inducing situations in a way that is similar to non-maltreated children. They are also more prone to experiencing dysregulation via activation of their 'stress circuits' (Middlebrooks & Audage, 2008; Pollak et al., 2008). Furthermore it has been found that maltreated children particularly struggle with regulating negative affect perhaps because of their reliance on maladaptive strategies (Shackman & Pollak, 2014), which was further evidenced in this review. Further studies should explore the specificity of the types of strategies employed in relation to different emotional states that are being regulated to better understand where to target support.

Based on the current understanding it seems appropriate to suggest that maltreated children can be supported to manage negative affect through encouragement, modelling and support to experience the positive outcomes associated with adaptive strategy usage.

The review of different ER assessments used highlighted a need to also examine the role of cultural background. Most of the adoptees in the studies were internationally adopted but there was no discussion of validity of measures for different cultural backgrounds. As was evident in Norris (2006) cultural background likely plays a role alongside the impact of maltreatment. In a context of intersectionality other individual characteristics such as ethnicity, socioeconomic status and gender are likely to also play a role and are worthy of sensitive consideration in research exploring the impact of maltreatment. This cultural influence needs to be considered carefully and one way of doing this is by reflecting on whether the pre-determined categorisation of strategies as adaptive and maladaptive is valid cross-culturally.

Another systematic review by Fritz et al. (2018) identified individual, family and community-level resilience factors that can prevent psychopathology following maltreatment. Their definition of maltreatment was much broader than the one used in this review (termed 'adversity'), but it does report the ways that ER and parenting resilience factors contribute and protect against later psychopathology. Specifically, they reported high distress tolerance and cognitive reappraisal and low expressive suppression and rumination as key ER resilience factors that mediate or moderate the association between adversity and psychopathology. In line with this, Waizman et al. (2020) found significant group-level differences in expressive suppression such that PI adoptees scored significantly higher on this scale of the ERQ-CA; no significant differences were found for cognitive reappraisal. Targeting specific skills that maltreated children showed difficulties with for support and intervention purposes would be beneficial considering their potential to be resilience factors. Another review explored the impacts of foster care and adoption (Fisher, 2015) and concluded with a similar message of hope and reflection on the mechanisms of positive change alternative caregiving can offer.

2.4.1 Strengths and Limitations

This review has strengths in its robustness and commitment to a pre-published protocol. Efforts were made to have abstracts and papers translated so that they could be considered for inclusion. Only one of six papers in a language other than English were not able to be translated (Bardyshevskaya & Trenina, 2008). Furthermore, authors were contacted for datasets for papers that had not analysed or had not published analyses comparing children within different caregiving contexts. In many papers maltreated children living in different caregiving arrangements were combined into one, maltreated, group without further analysis by caregiver.

This review did not include any domestic adoptees and scarcity of studies with this population has been identified elsewhere too (Brown et al. 2017). There is also recognition of limited research within the UK by others (e.g. Brown et al., 2017) which was found in this review. The limited information and direct assessment of maltreatment experiences is a limitation shared across all but one study (Robinson et al., 2009). The lack of reporting of details prevented an analysis of how factors like intensity, frequency and type of maltreatment experiences differentially contribute to ER development. It also highlights the heterogeneity of maltreatment assessment and the difficulties in distinguishing between maltreatment experiences validly (Moody et al., 2018). It was not possible to compare studies based on details of the adversity experienced due to the lack of detail in the papers. Further evaluation of the differences in studies relating to age, gender, or ethnicity was also not completed and would be helpful avenues of future research. Age in particular is an area of interest considering the development of ER over time and the influence of sensitive developmental periods (Dunn et al., 2018). Perry et al.'s (2019) paper indicated that differences in ER may be more apparent in older adolescent children. They also found a differential developmental trajectory of ER between maltreated and non-maltreated children. The PI adoptees' levels of ER remained fairly consistent across the ages and did not show a typical developmental increase with age. This supports other findings suggesting that regulation is developed earlier in maltreated children because they need it to survive and are arguably more experienced at employing ER skills in anxiety-provoking situations like the Trier Social Stress Test used. Evidence from wider literature compliments Perry et al.'s (2019) findings and highlights the need for longitudinal research and inclusion of a broad range of ages. Longitudinal research will also help to better understand how and if a catch-up effect is present within ER.

It was not possible to compare studies on clinical indices of ER because there were no standardised or normed measures. Interestingly only one paper, Waizman et al (2020), reported in their supplementary materials that both groups reported lower use of the adaptive reappraisal strategy and that the adopted group actually showed comparable use of the maladaptive emotion suppression strategy to age-related norms. Elsewhere in the literature there are reports of children in foster care being assessed within 'expected norms' for their age and not obtaining scores that put them into a standardised category of 'concern' on a caregiver report of ER (Jacobsen et al., 2013). Therefore, there are opportunities, particularly through the use of questionnaire assessments of ER, to contextualise scores against standardised norms which extends the analysis beyond a group comparison to consideration of the ecological significance of the scores.

This review also highlighted a gap in the literature relating to other types of alternative caregiving such as kinship care. Whilst many papers considered for inclusion described instances

of children being looked after by family members, their analyses did not distinguish between different types of caregiving arrangements and could not therefore be included. Future studies should endeavour to incorporate a wider variety of care arrangements to distinguish effects between them. Other reviews have explored these and found similar results suggesting it is the quality of care, rather than the specifics of the arrangements that is of importance (Kinsey & Schlösser, 2013; Washington et al., 2018; Wu et al., 2020).

The findings from this review substantiate and add to the literature outlining the damage of maltreatment on child development. It sits within fields of research exploring and considering mechanisms that translate maltreatment to detrimental developmental trajectories as well as the literature exploring resilience and protective factors, specifically the ways in which alternative caregiving can promote and maximise chances for positive and fruitful developmental trajectories. Perhaps unsurprisingly, given literature suggesting that psychological domains associated with ER show limited evidence of catch-up effects (e.g., attachment) (Van Ijzendoorn & Juffer, 2006), alternative caregiving alone does not seem able to eradicate substantial differences with non-maltreated counterparts. This reinforces the understanding of damage done by maltreatment. However, there is hope and future directions in the field that can gain better understanding of what maltreated children need from and within their alternative caregiving arrangements. The research encourages further investment in initiatives such as parental training and support to prevent childhood maltreatment. It also emphasizes the need to continue exploring and understanding protective and supportive factors so that more of these can be offered to the children who need them.

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Chapter 3 Empathy Development in Adopted Children with a History of Maltreatment and the Influence of Caregiver Empathy

Abstract

Empathy develops in the context of close relationships. Children observe their parents' emotional responses to others and listen to their parents explain emotions and associated behaviours. It follows that the experience of maltreatment interferes with typical empathy development because sensitive caregiving is compromised. This study aims to explore the influence of maltreatment and subsequent adoption on empathy development in a cross-sectional design comparing adopted with non-adopted primary-school-aged children. It is hypothesised that there will be a group difference, with adopted children scoring lower on parent-report and behavioural measures of empathy than the non-adopted group. Because empathy develops within caregiver-child relationships, it is expected that caregivers' empathy is associated with child empathy, and, further, that this relationship is moderated by maltreatment (group) status. The sample comprised 27 adopted and 72 non-adopted comparison children (Mean age = 8.77 years, SD = 1.61) and their caregivers living in the UK recruited through schools and adoptive agencies. A combination of questionnaire measures to assess trait empathy and behavioural assessments to assess state empathy is used. Adopted children scored significantly lower on both state and trait measures of empathy. Intriguingly caregivers also differed significantly on state and trait measures of empathy with adoptive parents scoring higher. Significant associations appear between caregiver and child trait empathy measures, but these relationships were not significantly moderated by maltreatment status. Findings are discussed in terms of their relevance for professionals, including in educational contexts, supporting maltreated children, and for biological and alternative caregivers.

3.1 Introduction

Vulnerabilities associated with childhood adversity are multi-dimensional. The damaging effects of childhood maltreatment on development has been widely documented including effects in biological (Berens et al., 2017), physiological (Kroupina et al., 2015), psychological (Karevold et al., 2009), behavioural (Esposti et al., 2020) and social (Zamir, 2021) domains. Negative outcomes following maltreatment have also been reported with respect to difficulties with mental health (Askeland et al., 2017), forming and the quality of peer relationships (DeLuca

et al., 2019), and reduced academic attainment (Brown et al., 2017). These areas of difficulty persist into a child's later and adult life too (Kreppner et al., 2007; Li et al., 2016; Mersky & Topitzes, 2010; Norman et al., 2012; Sonuga-Barke et al., 2017).

There are many conceptualisations and ways of assessing or measuring exposure to maltreatment including consideration of type, severity and frequency. The variety in approaches makes accurate assessment and differentiation of prevalence worldwide difficult (Norman et al., 2012; Stoltenborgh et al., 2015). UK statistics in 2020 indicated an incident rate of 60.1 per 100,000 children (Chandan et al., 2020). There are, however, well recognised universal definitions used consistently in the literature. These are proposed by organisations like the World Health Organisation (WHO) and Centers for Disease Control and Prevention (CDC) (Leeb et al., 2008). The definition referred to in this paper is by Leeb et al. (2008, p.11): "any act or series of acts of commission or omission by a parent or other caregiver that results in harm, potential for harm or threat of harm to a child". The four most common categories of maltreatment are sexual, physical, emotional or psychological abuse and neglect (Norman et al., 2012; Stoltenborgh et al., 2015).

Generally speaking, removal from a maltreating caregiving setting and transition to more adequate arrangements is associated with more positive outcomes than if a child remains in a maltreating environment. For example, longitudinal research shows that alternative and adequate caregiving can facilitate some 'catch-up' (McCrory et al., 2017; Van IJzendoorn & Juffer, 2006) or 'psychological recovery' (van den Dries et al., 2009) in certain developmental domains. However, many maltreated children show persistent vulnerability or delay particularly in socioemotional domains (Luke & Banerjee, 2013). In many countries there are systems to protect children against experiencing maltreatment and associated outcomes which often involves removing the child from their biological family, at least temporarily, to prevent further harm. In the UK, the majority of children are looked after (CLA) due to abuse and neglect (Bentley et al., 2020).

A variety of research methodologies have been applied to analyse the positive impacts of alternative caregiver settings (e.g., foster care or adoption) following prolonged maltreatment. This has included longitudinal (Kumsta et al., 2017; McCall et al., 2016; Sonuga-Barke et al., 2017) and cross-sectional (Luke & Banerjee, 2013; Van IJzendoorn & Juffer, 2006) research, but the majority are retrospective (Kumsta et al., 2017). Importantly, agreement between retrospective and prospective assessment of the impact of childhood adversity on development is low (Baldwin et al., 2019). Moreover, the different methodological approaches identify different, non-overlapping samples (Baldwin et al., 2019; Newbury et al., 2018; Reuben et al., 2016). There is also a comparatively limited amount of research with children, highlighting a need for more child-focused research.

In addition to identifying associations between maltreatment and negative outcomes researchers have also considered underlying mechanisms to account for such persistent difficulties. For example, the dimensional model proposed by Mclaughlin and Sheridan (2016) considers the differential influences of different types of maltreatment on aspects of development by distinguishing the experience of threat and deprivation implicated in the maltreatment exposure. For example, physical, emotional and sexual abuse would be considered high on the threat dimension and neglect would be considered to be high on the deprivation dimension. Understanding the mechanisms by which maltreatment negatively influences development is important because it offers opportunity for interventions, like alternative caregiving, to focus and promote enhancement in. For example, research has highlighted how difficulties with particular socioemotional skills can account for difficulties maltreated children experience. Socioemotional skills underpin successful and effective social and emotional processes. Luke and Banerjee (2012) interviewed foster carers who reported that difficulties with social understanding and empathy were specific, key contributing factors to the frequent socioemotional difficulties the children they looked after presented with. Meta-analyses and systematic reviews report that maltreated children have more difficulties than non-maltreated peers with socioemotional skills like emotion understanding (Luke & Banerjee, 2013), social cognition (Hyter, 2021) and on false-belief tasks (Benarous et al., 2015; Hyter, 2021). Maltreated children are more likely to experience more sadness, hostility and fear, and behave more aggressively (Lavi et al., 2019).

The impact of alternative caregiving within this domain has also been investigated. Goemans's (2015) meta-analysis of longitudinal research reported no changes in children's adaptive functioning and behavioural outcomes when residing in foster care. However, Chodura et al.'s (2021) meta-analysis specifically assessed aspects of foster care parenting and found links between functional parenting and adaptive child developmental outcomes. This is in line with other literature emphasising the quality of care, rather than the type of caregiving arrangement that is most influential (85 & Schlösser, 2013; Washington et al., 2018; Wu et al., 2020). There is comparatively little research exploring socioemotional skills in an adoption context although Blake et al. (2021) recently compared a dysregulation profile within a group of adoptees and found a dose-dependent negative effect of pre-adoptive maltreatment. There is a limited amount of research comparing aspects of socioemotional development in alternative caregiving to those who remain in maltreating environments. This type of evidence is more readily available for other domains such as physical, academic and relational development (van Ijzendoorn & Juffer, 2006) though.

Despite there being a wide range of research exploring the impact of maltreatment on socioemotional development generally there is less research on specific skills and therefore a lack of understanding of key underpinning mechanisms. In particular it is surprising that little research has explored the impact on empathy development considering how maltreatment has been reported to impact on related skills like perspective taking as assessed with false-belief tasks (Benarous et al., 2015; Hyter, 2021). Furthermore, other areas of difficulty commonly associated with maltreated children, such as social relationships and mental health, are also underpinned by empathy in a non-maltreated population (Stern & Cassidy, 2018). Unfortunately, there is limited research into empathy specifically in maltreated samples. Literature reviews conclude that generally speaking, maltreatment has negative consequences even within the context of alternative caregiving arrangements (Brown et al., 2017; Van IJzendoorn & Juffer, 2006) but there is insufficient research on specific socioemotional skills such as empathy.

3.1.1 Defining Empathy

Luke and Banerjee (2013) explored a variety of socioemotional skills and highlighted difficulties maltreated children can have with individual skills such as emotion recognition, understanding and perspective taking. These skills relate to the cognitive aspect of empathy and predict empathic skills and behaviours more generally (Cuff et al., 2014). In line with Stern and Cassidy's (2018) theoretical model, these skillsets can further vary according to individual differences and children's experiences contributing to different profiles of social understanding and empathy. Empathy is a multidimensional concept with an affective and a cognitive component (Cuff et al., 2014; Decety & Moriguchi, 2007). Some of the literature also conceptualises a behavioural component but empathy does not always lead to a behavioural outcome and the link with behaviours likely involves other factors (Cuff et al., 2014). Empathy is socially adaptive and implicates the same neural pathways as when the emotion is experienced personally (Mackes et al., 2018). It is described by Preckel et al. (2018, p.1) as "the process of sharing feelings, that is resonating with someone else's feelings, regardless of valence (positive/negative) but with the explicit knowledge that the other person is the origin of this emotion". Empathy is further categorised in the literature into "state empathy", a temporary psychological state influenced by stimuli, and "trait empathy", a personality characteristic that is more stable over time (McKenzie et al., 2021; Song et al., 2019). Self-report questionnaires are most commonly used to assess empathy in research. This limits the conceptualisation and understanding of empathy such that complimenting an assessment of "state empathy" via questionnaires with a behavioural assessment of "trait empathy" is becoming increasingly popular (Main & Kho, 2020; McKenzie et al., 2019). Luke and Banerjee (2012, 2013) highlight empathy, a

component of social understanding, as a key mediating influence on social and emotional development in maltreated samples but also acknowledge, as others have (Locher et al., 2014), that their conclusions draw on a limited evidence base.

There are multiple factors that contribute to empathy development including biological, genetic, temperament, and experiential influences (see Stern & Cassidy, 2018 for a review). One of the key influencing factors is argued to be the child-caregiver relationship. According to Stern and Cassidy's (2018) theoretical model, empathy has its basis in attachment. Bowlby (1969) even goes as far as suggesting that without a secure attachment adults cannot respond to others with empathy and attunement. Secure attachments implicate a caregiver responding sensitively and with attunement to a child's needs. In response a child feels safe and comfortable to explore out of their comfort zone, promoting psychological development across domains. Attachment relationships that are not secure, like those often accounted for in maltreating environments, are associated with a range of difficulties for the child, including socioemotional challenges and negative outcomes (Stern & Cassidy, 2018). For example, sexually abused preschoolers have more disorganised attachments (Charest et al., 2018) with their non-abusing, biological caregiver than a control group. Attachment is one of the domains where a catch-up effect is not as evident in research with PI adoptees (Van IJzendoorn & Juffer, 2006) suggesting that the negative consequences of maltreatment on attachment can be persistent despite introduction of more appropriate and sensitive caregivers. Whilst catch-up in height and IQ has been found to such an extent that adoptees were comparable to typically developing children, typically developing children remain consistently more securely attached than adoptees throughout childhood (Van IJzendoorn & Juffer, 2006). Notably, adoptees tend to be more securely attached than their non-adopted peers who remain in adverse environments, but it appears that alternative caregiving cannot deter the negative impacts of early maltreatment on subsequent attachments. There is also evidence that the impact of maltreatment on attachment can be protected against through a child's skills in other areas like emotion regulation (Hawkins & Haskett, 2014) suggesting that individual differences in a range of socioemotional skills are influential on attachment and therefore empathy. This suggests that maltreated children who transition to alternative care are likely to already have interrupted attachments. The impact of this on their empathy development needs to be understood. Then, research can consider whether their existing empathy and other socioemotional skills can protect against this effect.

Two studies (Fourie et al., 2019; Locher et al., 2014) have used retrospective methods to explore the association between maltreatment and empathy in adults. Locher et al. (2014) identified overall deficits on their empathy measures and differential impacts of maltreatment on empathy dependent on the severity of maltreatment experienced. Empathy was assessed

through participants' responses to videos of hearings investigating human rights violations. Fourie et al. (2019) assessed the impact of social discrimination on brain responses associated with empathic responding. They found that greater social adversity was associated with reduced compassion. This finding is in line with McCrory et al.'s (2017) theory of latent vulnerability, implicating underpinning brain activity patterns to distinguish behavioural differences between children and young people exposed to early maltreatment and typically developing samples.

3.1.2 The Influence of Caregiver Empathy

Stern & Cassidy's (2018) theoretical model of individual differences in empathy acknowledges individual, dyadic, group and societal moderators linking attachment with empathy. They further explain the connection between these moderators and parenting, an environmental influence. According to the model, although individual differences in empathy likely stem from a combination of temperament, biological, and genetic factors (see also Knafo & Uzefovsky, 2013), its development also appears to be related to interactions with parents (see also Spinrad & Eisenberg, 2019). In fact, parental empathy itself is one contributing factor. There is evidence to suggest that maltreating parents experience greater personal distress, and reduced perspective taking and empathic concern than non-maltreating caregivers, including foster caregivers (Asla et al., 2011; Kim & Cicchetti, 2010; Meidan & Uzefovsky, 2020; Shipman et al., 2007; Shipman & Zeman, 2001). This results in fewer parenting practices associated with child empathy; for example, less capacity to be a co-regulator with their child and less parental socialisation including modelling and emotion socialisation (Eisenberg et al., 1998; Hersh & Hussong, 2009; Shipman et al., 2007; Shipman & Zeman, 2001; Zhou et al., 2002). Maltreating parents and more specifically the use of punitive discipline and excessive control is linked with less child empathy (Cornell & Frick, 2007; Yoo et al., 2013).

Parental empathy can therefore be both a risk factor, when there is a lack of it, or a protective factor where it is present. Maltreated children have an opportunity to experience typical parental empathy in an alternative caregiving environment. The consequences of this are not well understood but considering theories of parental socialization (Eisenberg et al., 1998; Hoffman, 1983) it follows that alternative caregivers could contribute positively to interrupted empathy development in maltreated children. Meidan and Uzefovsky (2020) recently found direct and mediated associations between parent and child empathy using questionnaires in a sample of biological caregiver-child dyads in environments deemed 'at-risk' of child maltreatment but similar research within an adoptive context is not available. This evidence contributes to an understanding of intergenerational transmission of empathy and a push for investigation of empathy at a relational level (Main & Kho, 2020). However, considering literature reporting that

attachment is negatively impacted by maltreatment (Charest et al., 2018; van Ijzendoorn & Juffer, 2006) and plays a pivotal role in empathy development (Stern & Cassidy, 2018) the ways in which empathy development is influenced by both maltreatment and subsequent adoption is less understood. Adoptive caregivers could have similar influence to that of a biological parent but it may also be that the negative impact of maltreatment on children's empathy development pose unique challenges and circumstances that require different parental socialization practices. It follows that the association between child and caregiver empathy in an adoption context, specifically following previous experiences of maltreatment, would differ between maltreated and non-maltreated samples.

3.1.3 Current Study

In summary, empathy is the result of interactions between sensitive parenting, attachment and moderators that are both internal and external to the child. Empathy development is interrupted for maltreated children because parenting and the development of secure attachments are compromised. Considering the significance of empathy for social understanding (Luke & Banerjee, 2013) and relationship-building (Boele et al., 2019), it is surprising that the impact of maltreatment on empathy specifically has not yet been extensively explored. There is strong theoretical evidence to suggest that empathy development is altered by maltreatment. Therefore, the first aim of this study is to assess empathy in children with a history of maltreatment compared to children without a history of maltreatment. As there is emerging evidence that caregiver and child empathy are correlated, the secondary aim of this study is to consider the role of caregiver empathy and specifically its association with child empathy in the context of adoption and maltreatment experiences. Due to the lack of evidence-based literature relating to this secondary aim this paper seeks to explore associations between maltreatment experiences, and caregiver and child empathy. Accordingly, the primary research question is: Do children who were maltreated and subsequently adopted have less empathy than non-maltreated children living with their biological family? The secondary research question is: Does maltreatment experience moderate the association between parent and child empathy?

3.2 Methods

3.2.1 Hypotheses

With regard to the primary research question, it is hypothesised that there will be a group difference, with adopted children scoring lower on empathy measures than the non-adopted group.

With regard to the secondary research question, it is hypothesised that an association between caregiver and child empathy exists in both groups. A moderation analysis is used to explore the influence of a child's maltreatment experiences on this association.

3.2.2 Design

This research was part of a larger-scale study within the University of Southampton's Centre for Innovation in Mental Health (CIMH) Adversity Research Project (CARE). The CARE research team is comprised of two supervisors, four doctoral students, and a group of undergraduate researchers and research assistants. Recruitment was shared among the doctoral students and a variety of data pertaining to different research foci was collected. This paper describes the key aspects relevant to the author's specific research project and research questions.

3.2.3 Participants

Two groups of children and their parents were compared on measures of empathy. In total, after excluding participants who did not meet the age and caregiving experience criteria data pertaining to 105 children were available. Seventy-six children (59.2% boys) were non-maltreated and remained living with their biological caregiver(s) since birth. Twenty-nine children (44.8% boys) were adopted following maltreatment constituting approximately 25 percent of the sample. Children were between the ages of 6 and 11 years old (Mean age = 8.77 years, SD = 1.61). Age of placement for the adopted sample ranged from 1 month old to 7.42 years (7y5m).

Demographics of the current sample are presented in Table 3. No significant differences between groups were observed for child sex, child age, caregiver sex, and caregiver role (see Appendix C). Children's cognitive ability was assessed for a subsample (*n* = 21) taken from both groups (Adopted group *n* = 7; Non-adopted group *n* = 14) with the composite score derived from the Matrix Reasoning and Vocabulary subscales of the Wechsler Abbreviated Scale of Intelligence – Second Edition (WASI-II; Wechsler, 2011). The two groups differed significantly on the WASI-II composite score, therefore, cognitive ability was controlled for in subsequent analyses involving the subsample. Sibling participants that met the inclusion criteria were permitted.

Table 3

Demographic Details of Participants by Group

Demographic Variables	Total (*N*)	Group

		Adopted (*N*)	Biological (*N*)
Gender of child			
Male	58	13	45
Female	47	16	31
Age of child (Years)			
6	18	3	15
7	22	4	18
8	19	8	11
9	17	3	14
10	16	5	11
11	13	6	7
Number of foster care placements prior to adoption			
0		1	-
1		12	-
2		3	-
3		1	-
4		0	-
5		1	-
Missing		11	-
Gender of caregiver			
Male	10	5	5
Female	94	24	70
Age of caregiver (Years)			
20 – 29	5	-	5
30 – 39	38	5	33
40 – 49	47	15	34
50 – 59	11	8	3
Missing	2	1	1
Highest level of parent education			
GCSE/O levels	10	4	6
A levels	6	-	6
Vocational training	10	2	8
University degree	48	9	39
Higher degree	29	13	16
Missing	2	1	1

3.2.4 Recruitment

Both groups were recruited through primary schools, local authority newsletters for families, adoptive agencies' newsletters and social media platforms and advertisements on researcher's personal and professional social media accounts. The recruitment advertisements targeted parents of adopted and biological children with and without a history of maltreatment. Specifically, parents of adopted children were invited to participate if their child had a history of abuse and neglect, and parents of biological children were invited to participate if their child had no history of abuse and neglect. Additional exclusion criteria included a diagnosis of Fetal Alcohol Syndrome and children outside of the age range of six to eleven years old.

3.2.5 Measures

In summary, 99 of the children had individual parent-report questionnaire data which included questionnaires assessing both child and caregiver empathy. The reduction in sample size was because six participants did not have data relevant to the author's research questions. Twenty-one children (two did not have compatible questionnaire data) also had behavioural assessment data via the KEDS (Kids Empathic Development Scale - see below; Reid et al., 2013). Fourteen parents of the 21 children in the subsample also completed a behavioural assessment of their own empathy using the Empathic Accuracy Task (EAT) (Mackes et al., 2018; Zaki et al., 2009). Both child and parent empathy were assessed. The questionnaire data constitutes an assessment of trait empathy. The behavioural assessments (KEDS and EAT) assess state empathy. In cases of siblings, parents were asked to complete questionnaires for each participating child, and one EAT per family (rather than per child - see below).

3.2.5.1 Child Trait Empathy - Griffith's Empathy Measure

The Griffith's Empathy Measure (GEM) (Dadds et al., 2008) is a 23-item parent report standardised assessment of child trait empathy. Respondents are asked to rate their level of agreement on a 9-point Likert scale ranging from 'Strongly Disagree (-4)' to 'Strongly Agree (+4)'. It is comprised of three subscales: cognitive empathy, affective empathy, and a total empathy score. A higher subscale score represents a higher level of child trait empathy. The GEM has been shown to have good test-retest reliability and convergent validity for respondents referring to their child aged 4 to 16 years old (Dadds et al., 2008). Cronbach's alphas for the 6-item cognitive, 9-item affective empathy and 23-item total empathy subscales were in a good range for this study (.76, .67, and .87, respectively).

3.2.5.2 **Caregiver Trait Empathy - Interpersonal Reactivity Index**

The Interpersonal Reactivity Index (IRI) (Davis 1980, 1983) is a 28-item self-report standardised questionnaire used to assess adult trait empathy. In this study it was used to assess caregiver's empathy. Caregivers were asked to rate their level of agreement on a 5-point Likert scale ranging from 'Does not describe me well' to 'Describes me very well'. It is comprised of four 7-item subscales: Perspective Taking, Fantasy, Personal Distress and Empathic Concern. A higher subscale score represents a higher level of adult trait empathy. The Perspective Taking and Fantasy subscales are widely considered assessments of cognitive empathy and the Personal Distress and Empathic Concern subscales are described as assessing affective empathy (Meidan & Uzefovsky, 2020). The four subscales are inter-related and also constitute valid and independent aspects of empathy with associations to social functioning, self-esteem, emotionality and sensitivity to others (Davis, 1983; Hawk et al., 2013; Kang et al., 2009; Manarte, 2017). The IRI has been shown to have good test-retest reliability and convergent validity (Davis, 1983) for adults. Cronbach's alphas for the four subscales were in a good range in this study (Perspective Taking: .74, Fantasy: .77, Personal Distress: .82, and Empathic Concern: .73).

3.2.5.3 **Child State Empathy - Kids Empathic Development Scale (KEDS)**

The Kids Empathic Development Scale (KEDS, Reid et al., 2013) is a standardised interactive measure that assesses cognitive, affective and behavioural aspects of state empathy. It uses emotion recognition, picture-based scenarios and behavioural self-report. It was delivered virtually by the researchers directly with the children over Microsoft Teams. Children were encouraged to provide verbal responses because it was not possible for the researchers to see what children pointed at on Microsoft Teams. Children were presented with 12 faceless drawings of people one at a time. The drawings portrayed characters of various genders and ages. At the beginning of the task children were asked to provide emotion labels to six ideograms and were prompted to use the pre-determined labels of sad, happy, angry, surprised, afraid, and relaxed if they did not do so independently. Children were asked questions relating to both the depicted victim and protagonist characters. Children's affective empathy was assessed when they were asked to assign one of the six pre-labelled emotions to each faceless individual in the drawing (e.g., *How do you think the boy feels?*). The ideograms were available for children to see and choose from with each picture presentation. Children were asked a series of questions relating to the emotional label they provided which assessed their cognitive empathy (e.g., *Why do you think this boy feels happy?*) and behavioural empathy (e.g., *What would you have done if you were that boy?*). Subscale scores were derived for each aspect of empathy assessed by summing scores

across the 12 drawings. Higher scores in each subscale represents a higher level of child state empathy.

The KEDS is validated for use with children between 7 and 10 years of age (Reid et al., 2013), and was recently modified for use with pre-schoolers (Ştefan & Avram, 2019). It has been used effectively with vulnerable groups such as preterm 7-year-olds (Campbell et al., 2015). Cronbach's alpha in this study was .68 for the 18-item Affective Empathy subscale, .75 for the 31-item Cognitive Empathy subscale, .64 for the 21-item Behavioural Empathy subscale, and .85 for the 69-item Total Empathy scale.

3.2.5.4 **Caregiver State Empathy - Empathic Accuracy Task (EAT)**

The Empathic Accuracy Task (EAT) (Mackes et al., 2018; Zaki et al., 2009) is an assessment of adult state empathy involving naturalistic stimuli. EAT empathic accuracy scores are associated with neurological activity in regions of the brain implicated in empathy and with cognitive empathy assessed through the Perspective Taking subscale of the IRI (Mackes et al., 2018; Zaki et al., 2009). Caregivers were sent a link to access the task on their personal web browser. The task was hosted on the JATOS (Lange et al., 2015) platform. Caregivers were provided with a pre-recorded instruction video and a demonstration of the task. Caregivers were asked to watch eight short (approximately 90-seconds) video clips of another person describing an autobiographical event. Whilst watching, participants continuously rated the intensity of the emotion of the narrator via button pressing on a keyboard. The rating scale ranged from 1 (No emotion) to 9 (Very strong emotion), with 5 (Moderate Emotion) as the pre-set, middle option. The videos included four 'Happy', two 'Angry' and two 'Sad' clips validated by Mackes et al. (2018). After each video caregivers were subsequently asked to choose which of six emotion labels (Happy, Angry, Surprised, No Emotion, Sad, Frightened) they perceived the narrator of the video was experiencing whilst speaking, which emotion label they experienced most strongly themselves whilst watching the clip and to rate the intensity of their emotion on the same rating scale ranging from 1 to 9.

An empathic accuracy score was calculated through correlating the caregiver's ratings (every 2 seconds) with the narrator's original ratings of their own video clip. For analysis, Pearson correlations between the narrator's and caregiver's emotional strength ratings were Z-transformed (Fisher's Z transformation – see Zaki et al., 2009) to correct for interindividual variation in use of the rating scale. The score therefore reflects the dynamic nature of empathy. Empathic accuracy scores were averaged to create an EAT-Total score. The scores relating to the Happy videos were averaged to create an EAT-Positive score and the scores relating to the Angry and Sad videos were averaged to create an EAT-Negative score.

3.2.5.5 **Maltreatment Screening Tool – ACE-Q and Y-VACS**

As part of the participant screening process pre-validated questionnaires were used to assess maltreatment experiences. These questionnaires were used only to confirm the presence of maltreatment in the adopted group and an absence of maltreatment in the biological group. Only items 5 to 8 of the Adverse Childhood Experiences Questionnaire, Child-version (ACE-Q; Centre for Childhood Wellness, 2015) (e.g. *More than once, your child went without food, clothing, a place to live, or had no one to protect him/*her) and items 14, and 17 to 19 (e.g. *Has an adult in the household hit, pushed, or thrown your child?*) were considered indicators of maltreatment as these were in line with Leeb et al.'s (2008) definition used. See Appendix B for further details.

Two tools were used: the ACE-Q and the Yale-Vermont Adversity in Childhood Scale-Parent Report (Y-VACSpr; Hudziak & Kaufman, 2014). The ACE-Q was used in the earlier stages of recruitment. In total, 62 participants used the ACE-Q and 49 participants, including the subset who completed behavioural measures, used the Y-VACS. One adopted child was excluded, and six biological children were excluded.

The ACE-Q is a 17-item parent report questionnaire measuring children's exposure to adversity. It is composed of two scales that are scored separately. The first ten questions include the original ACE items (Felitti et al., 1998) and the additional seven questions cover other adversities such as foster care experience and discrimination. Parents were asked to indicate 'Yes' or 'No' to each item. Parents of biological children who indicated 'Yes' to any items except for the item enquiring about divorce were excluded. Parents of adopted children who indicated 'Yes' to items were also asked to give information about the timing of exposure by selecting one of three options asking if their child was exposed to the adversity 'Before', 'After' or 'Before and after' adoption.

The Y-VACS is a 20-item parent report measuring children's exposure to adversity. It is composed of two scales of maltreatment experiences: intra- familial (e.g., *"Has your child ever been bullied?"*) and extra-familial (e.g., *"Has an adult in the household ridiculed, rejected, or threatened your child?"*). Parents were asked to rate the frequency their child had experienced, or not, the situation described in the item on a 3-point Likert Scale ranging from '0-Never' to '2-More than once'. If they indicated that the frequency was at least a score of 1 ('One Time') then they were prompted to rate the severity of the child's experience of the item on a 3-point Likert scale ranging from '1 Mild or Suspected' to '3-Severe'. Therefore, higher scores were indicative of a child having more severe and/or more frequent exposure to intra- and extra-familiar adversity.

3.2.5.6 **Cognitive Ability – WASI-II**

The Wechsler Abbreviated Scale of Intelligence – Second Edition (WASI-II; Wechsler, 2011) is a commonly used and valid measure of cognitive ability. Two of the subtests were used: Vocabulary and Matrix Reasoning. The Vocabulary assessment is comprised of 31 items that examines word knowledge, verbal concept formation, fund of knowledge and degree of language development. The Matrix Reasoning assessment is comprised of 30 items that measure spatial ability and perceptual organisation. Raw scores for each subtest are computed into *T*-scores (M=50, SD=10) and a composite Full-Scale 2 score is derived from the sum of their *T*-scores (M=100, SD=15). The composite score was compared between groups.

3.2.6 Statistical Procedure

Analyses were conducted in three parts. First, descriptive statistics and bivariate correlations were examined for the entire sample and for each group separately. Then, the first research question was explored through examination of group differences in trait (GEM questionnaire) and state (KEDS) measures of child empathy. WASI-II scores were used as a covariate where available (N = 21) in analyses as supplementary exploratory analyses. These are indicated within each section below. A Shapiro-Wilk test showed a significant deviation from normality on the Personal Distress subscale of the IRI in the adopted group ($W(26) = .92$, $p = .057$), the Cognitive subscale of the GEM in the biological group ($W(72) = .96$, $p = .018$) and all four of the IRI subscales in the biological group (Personal Distress subscale: $W(68) = .96$, $p = .038$; Perspective Taking subscale: $W(68) = .95$, $p = .009$; Fantasy subscale: $W(68) = .96$, $p = .016$; Empathic Concern subscale: $W(68) = .93$, $p < .001$). Shapiro-Wilk tests were non-significant for all other measures indicating an acceptable level of normality to use parametric analyses9. Comparisons between groups and correlational analyses on these scales were re-analysed using non-parametric analyses (see Appendix D). All but one finding (correlation between the GEM Total scores and the IRI Personal Distress subscale scores in the biological group) remained the same when using non-parametric tests. This is considered further in section 3.3.3. Levene's test assumptions were met in most cases; instances where this is not the case are made clear in Table 4. Finally, the second research question was considered through exploratory moderation models to analyse the role of parental empathy in the association between maltreatment and child empathy using PROCESS v3.5 (Hayes, 2018). All analyses were False Discovery Rate (FDR) corrected for multiple comparisons (Benjamini & Hochberg, 1995). Instances where this alters the reported significance of results are described in further detail below; only one correlation in the biological group was altered through this correction. The corrected significance levels were as follows:

- t-test analyses: p = .025
- correlational analyses in biological group: p = .026
- correlational analyses in adopted group: p = .004

3.3 Results

3.3.1 Hypothesis 1: Group-level differences – Child Empathy

When comparing means of study variables between groups there were significant differences on trait and state measures of child empathy. Descriptive statistics are displayed in Table 4 for each group separately. Bivariate correlations for each group are displayed in Table 5.

3.3.1.1 Child Trait Empathy - GEM

A series of independent-samples t-tests were run to determine if there were differences in parent-reported child empathy (GEM) between maltreated (adopted) and non-maltreated children. Overall, parents of non-maltreated children reported their children to have significantly greater scores on the GEM's cognitive, affective and total empathy subscales. Exploratory analyses were run on the sub-sample which had WASI-II data available. One-way ANCOVAs (analysis of covariance) were run controlling for the WASI-II Composite Score. The group differences within the sub-sample for all scales became non-significant such that there were non-significant differences between the groups within the subsample where both measures were available (n = 19). The change in scores was such that groups were more similar in their mean scores as follows:

GEM Total: Maltreated group (n = 6; M = 149.17, SD = 21.56) vs. Non-maltreated group (n = 13; M = 148.38, SD = 13.48); F(1, 16) = .36, p = .557, d = .30; covariate p = .222

GEM Cognitive: Maltreated group (n = 6; M = 41.33, SD = 9.37) vs. Non-maltreated group (n = 13; M = 39.62, SD = 5.55); F(1, 16) = .01, p = .937, d = .04; covariate p = .539

GEM Affective: Maltreated group (n = 6; M = 52.33, SD = 6.47) vs. Non-maltreated group (n = 13; M = 53.31, SD = 5.82); F(1, 16) = .10, p = .753, d = .16; covariate p = .924

3.3.1.2 Child State Empathy - KEDS

A series of independent-samples t-tests was run to determine if there were differences between maltreated and non-maltreated children in child empathy assessed with the KEDS. Groups differed in the hypothesised direction. There were significant group-level differences for

the KEDS Total and Cognitive scales such that non-maltreated children demonstrated higher scores. Whilst the scores for the KEDS Affective and Behaviour scales were in the same direction, their differences between groups were non-significant. Exploratory one-way ANCOVAs were run controlling for the WASI-II. There still appeared to be a significant difference in scores between groups as follows and the results remained significant:

KEDS Total: Maltreated group (n = 7; M = 94.00, SD = 4.80) vs. Non-maltreated group (n = 14; M = 107.50, SD = 11.22); $F(1, 18) = 5.22$, $p = .035$, $d = 1.08$; covariate $p = .631$

KEDS Cognitive: Maltreated group (n = 7; M = 41.57, SD = 3.99) vs. Non-maltreated group (n = 14; M = 49.57, SD = 5.56); $F(1, 18) = 5.21$, $p = .035$, $d = 1.07$; covariate $p = .211$.

Table 4

Descriptive Statistics by Group

	Adopted Children					Non-adopted Children					*T*	*df*	*p*	*d*
	N	*M*	*SD*	*Skew-ness*	*Kurt-osis*	*N*	*M*	*SD*	*Skew-ness*	*Kurt-osis*				
Children's Empathy Measures														
GEM – Total Empathy	27	132.62	24.66	-.26	-.26	72	149.25	23.21	-.37	-.21	**3.12**	**97.00**	**.002**	**0.70**
GEM – Cognitive Empathy	27	33.91	10.44	.18	-1.02	72	39.91	8.59	-.51	-.58	**2.92**	**97.00**	**.004**	**0.66**
GEM – Affective Empathy	27	38.79	8.17	-.81	1.93	72	53.45	9.10	-.03	.32	**2.32**	**97.00**	**.022**	**0.53**
KEDS – Total Empathy	7	94.00	4.80	-.51	-.26	14	107.50	11.22	-.14	-1.11	**3.85**	**18.80***	**.001**	**1.40**
KEDS – Cognitive Empathy	7	41.57	3.99	.82	2.04	14	49.57	5.56	.03	-1.25	**3.38**	**19.00**	**.003**	**1.56**
KEDS – Affective Empathy	7	20.57	3.46	.51	-1.23	14	23.36	4.05	-.74	.80	1.55	19.00	.137	0.72
KEDS – Behavioural Empathy	7	26.86	2.54	-.54	-.86	14	29.07	3.73	-.90	.00	1.41	19.00	.176	0.65
Parent Empathy Measures														
IRI – Personal Distress	26	7.76	4.92	.82	.25	68	11.54	5.45	.34	.82	**3.09**	**92.00**	**.003**	**0.71**
IRI – Perspective-Taking	26	20.27	3.29	.57	.24	68	19.97	4.41	-.84	2.39	.31	92.00	.755	0.07
IRI - Fantasy	26	14.50	5.86	-.02	1.01	68	15.85	5.65	-.44	-.31	1.03	92.00	.307	0.24

IRI – Empathic Concern	26	22.50	3.49	-.28	-.66	68	21.74	4.24	-1.04	2.08	.82	92.00	.415	0.19
EAT - Total	5	0.62	.36	-1.45	2.23	8	0.50	.10	-.23	-1.79	-.74	4.40*	.496	-0.53
EAT – Positive	5	0.57	.33	-1.39	1.66	8	0.50	.20	-.84	-.29	-.47	11.00	.646	-0.27
EAT - Negative	4	0.83	.18	.24	-.14	8	0.50	.13	.04	1.23	**-3.69**	**10.00**	**.004**	**-2.26**

*Note. * =* Levene's Test for Equality of Variances was significant, results when equal variances are not assumed are reported.

3.3.2 Hypothesis 2: The Role of Caregiver Empathy

The associations between caregiver and child empathy were explored through a moderation analysis to test Hypothesis 2. First, differences between caregiver groups were explored to investigate caregiver empathy across the groups. Then, maltreatment was considered as a potential moderator in the association between caregiver and child empathy. Correlations between child and caregiver empathy measures within each group are considered separately. Then, a moderation analysis is presented.

3.3.2.1 Caregiver Trait Empathy – IRI

I first explored differences in self-reported trait empathy between parent groups through a series of independent-samples t-tests (see Table 4). Parents of maltreated and non-maltreated children only differed significantly on the Personal Distress scale, with adoptive parents reporting lower levels of personal distress in response to negative emotional states of their children.

3.3.2.2 Caregiver State Empathy – EAT

Next,the author explored differences between caregiver groups in state empathy using a series of independent-samples t-tests (see Table 4). Overall, the empathic accuracy scores were greater in the parents of adopted children and the group-level difference was significant for the Negative composite. Further investigation of the Negative composite revealed that the significant difference was driven by the adoptive caregiver group having higher scores on the Sad videos.

3.3.3 Intercorrelations Between Child and Caregiver Empathy

The pattern of caregiver-child empathy correlations varied across the two groups and group-specific associations are noted in Table 5. In order to explore the role of maltreatment (group) status in the caregiver-child empathy associations the intercorrelations are presented for

each group separately. There were too few data to run correlation analyses on the EAT and KEDS data (*n* is less than 25; see Bonett & Wright, 2000), further data is needed.

3.3.3.1 Trait Empathy Intercorrelations – GEM and IRI

Several significant correlations were found between the trait measures of child empathy (GEM) and caregiver empathy (IRI) in each group. Six significant correlations were found between the GEM and IRI subscales in the biological group. Specifically, the IRI Perspective Taking subscale significantly correlated (*r*s ranging from .30 to .37) with all three GEM subscales in the biological group. The IRI Personal Distress subscale significantly and negatively correlated with the GEM Total scale in the biological group only. IRI Empathic Concern significantly correlated with the GEM Total and GEM Cognitive subscales in the biological group only. All of these correlations remained significant after the FDR correction for multiple comparisons. The corrected significance level for the biological group was $p = .026$. There were significant deviations from normality on the GEM Total and all IRI subscales in the biological group, as outlined previously. A non-parametric Spearman's analysis found a non-significant negative correlation between GEM Total and IRI Personal Distress subscales, $r(66) = -.116$, $p = .347$. All other correlations retained their significance levels in the non-parametric test (see Appendix D for further details).

There was one significant GEM-IRI correlation in the adopted group. The IRI Fantasy subscale significantly correlated with the GEM Affective subscale in the adopted group only however this did not remain significant after adjusting for multiple comparisons using the FDR correction which set the corrected significance level at $p = .004$.

Table 5

Intracorrelations Between Empathy Measures by Group

Variable	1	2	3	4	5	6	7
1. GEM – Total Empathy	**1.00**	.765**	.761**	-.253*	.492**	.117	.338**
2. GEM – Cognitive Empathy	.792**	**1.00**	.304**	-.186	.403**	.148	.262*
3. GEM – Affective Empathy	.693**	.208	**1.00**	-.152	.333*	.150	.180
4. IRI – Personal Distress	-.030	-.117	.127	**1.00**	-.121	.049	-.070
5. IRI – Perspective-Taking	.129	.202	.219	-.021	**1.00**	.244*	.581**
6. IRI - Fantasy	.288	.089	.506**	.473*	.283	**1.00**	.280*

7. IRI – Empathic Concern	.220	.180	.112	-.052	.357	.326	**1.00**

Note. Biological group above the diagonal and adopted group below the diagonal. Sample sizes varied from *n* = 4 to *n* = 27 in the adopted group and from *n* = 7 to *n* = 72 in the biological group.

* *p*<.05 ** *p*<.01

3.3.4 Moderation analyses

Parental empathy was used as a predictor and maltreatment (group) status as a moderator in predicting child empathy using PROCESS v3.5 (Hayes, 2018). Considering the number of measures of child and caregiver empathy used and to reduce the impact of risk and bias associated with multiple comparisons measures were pre-selected for analysis. The measures used in the moderation analysis were selected based on the analyses exploring group differences and intracorrelations. Specifically, the GEM Total subscale was selected as the measure of child empathy because it had the largest effect size for group-level differences, had a larger number of participants with relevant data and showed significant and moderate correlations with all but one of the subscales of the IRI. The Perspective Taking and Empathic Concern subscales of the IRI were selected as the measures of caregiver empathy because there were negligible differences between caregiver groups on the scales, they had a larger number of participants with relevant data, and they were significantly correlated with multiple measurements of child empathy. Furthermore, the measures selected intercorrelated with other subscales within the same measure. The GEM Total scores had high correlations with the GEM Cognitive and Affective subscales (rs > .7) and the PT and EC subscales of the IRI also intercorrelated with other IRI subscales, except the PD.

Tables 6 and 7 show that the relationships between parental empathy and child empathy was not significantly different for those with and without a history of maltreatment and subsequent adoption. Both models showed a main effect of group but no main effect of caregiver empathy although the associations between child (GEM Total) and caregiver empathy (IRI PT) approached significance (p = .07). However, the interaction between maltreatment status and parental empathy did not moderate the association between parent and child empathy. The analyses confirmed that child empathy is higher if the parent is biological and the child does not have a history of maltreatment. Child empathy was also higher if parents' scores on the IRI PT subscale was higher, although this was not significant.

Table 6

Results of Moderation Analysis: Caregiver Empathy (IRI Perspective Taking) Predicting Child Empathy (GEM Total)

Variable	*B*	*SE*	*t*	*p*	95% CI
IRI Perspective Taking	4.20	2.26	1.86	.07	-.28, 8.68
Maltreatment Status (Group)	-15.51	5.70	-2.72	.01	-26.82, -4.21
IRI PT x Maltreatment Status	-1.61	2.10	-.77	.44	-5.77, 2.55

Note. CI = Confidence Intervals

Table 7

Results of Moderation Analysis: Caregiver Empathy (IRI Empathic Concern) Predicting Child Empathy (GEM Total)

Variable	*B*	*SE*	*t*	*p*	95% CI
IRI Empathic Concern	2.18	1.99	1.10	.28	-1.77, 6.13
Maltreatment Status (Group)	-16.11	5.81	-2.77	.01	-27.63, -4.58
IRI EC x Maltreatment Status	-.30	1.70	-.18	.86	-3.68, 3.08

Note. CI = Confidence Intervals

3.4 Discussion

Empathy is important for positive and healthy social and emotional development. The impact of maltreatment on empathy is less well understood but considering the importance of empathy in other aspects of development like building social relationships (Stern & Cassidy, 2018) it is crucial that any negative consequences of maltreatment on empathy development are well understood so that appropriate support can be integrated for these vulnerable children. The current study sought to add to the growing understanding of empathy development following maltreatment by examining differences in empathy between maltreated and non-maltreated children. Significant group-level differences between maltreated and subsequently adopted children and non-maltreated children remaining with their biological caregivers were found on the parent-

report child trait empathy measure (GEM) and the state empathy measure (KEDS). The children in the adopted group scored significantly lower on both measures than the children in the biological comparison group. The difference on the KEDS Total and KEDS Cognitive measures remained significant when controlling for WASI-II scores within a subsample for which this data was available.

This study also examined the ways in which parental empathy relates to child empathy. Surprisingly, significant group-level differences were found on some measurements of caregiver empathy. The adoptive caregivers reported lower scores on the IRI Personal Distress subscale. This indicates that they experience less personal distress when faced with negative experiences of others enabling greater compassion and empathy for the other person (Davis, 1983). Adoptive caregivers also scored significantly higher on the EAT Negative videos, depicting angry and sad emotions. This suggests a greater empathic accuracy for negative emotions in the adoptive parents. The hypothesis that parent and child empathy were associated was also supported. Five intercorrelations between subscales of the parent-report child empathy (GEM) and the parent-report empathy (IRI) questionnaires were significant in the biological group. No significant correlations appeared in the adoptive group on these trait empathy measures once a FDR correction had been applied. The exploratory moderation analysis reported that the associations between caregiver and child empathy was not moderated by maltreatment status. Caregiver empathy was not differentially related to child empathy depending on childhood maltreatment experiences. Main effects of group were found, supplementing the group-level differences in child empathy measures.

Our findings support others in the field insofar as identifying less empathy in those with experiences of maltreatment. Both qualitative (Luke & Banerjee, 2012) and quantitative (Fourie et al., 2019; Locher et al., 2014; Main & George, 1985) research has identified a similar pattern of findings. This study, however, is unique in its approach to exploring empathy development in maltreated school-age children and comparing between adopted and biological contexts. Examination of systematic reviews exploring associated and interrelated psychological domains such as facial emotion processing and recognition (da Silva Ferreira et al., 2014) and social understanding (Luke & Banerjee, 2013)also highlight a deficit in maltreated children. This means that this study contributes to a growing evidence base examining the impact of maltreatment, as well as subsequent alternative caregiving arrangements, on socioemotional development generally and more specifically on empathy development. Considering that empathy is increasingly being considered a key mechanism by which maltreatment impacts on socioemotional development (Luke & Banerjee, 2013) the current study has added to this understanding.

It has established a significant group-level difference between maltreated and nonmaltreated school-age children that is present even in a context of adoption. Whilst the cross-sectional design of this research prevents indications of potential catch-up effects it does suggest that differences in empathy remain evident in school-age maltreated children who are adopted.

There were no significant intercorrelations between caregiver and child empathy in the adopted group after using the FDR correction for multiple analyses. All correlations between the IRI and GEM subscales in the biological group remained significant after applying the FDR correction. However, the non-parametric Spearman's correlation between the IRI Personal Distress and the GEM Total subscales did not confirm this. The non-parametric analysis is a more appropriate test for these measures as both significantly deviated from normality. Therefore the significant parametric correlation with FDR correction was disregarded. . These results highlight caregiver empathy, specifically empathic concern and perspective taking, as possible contributing factors to child empathy in a non-maltreating, biological context. Of course, correlation does not infer causation and factors like amount of exposure to maltreatment, timing of adoption and age at time of empathy assessment also likely play a role. In the moderation analysis IRI Perspective Taking approached significance as a main effect influencing GEM Total. Meidan and Uzefovsky (2020) also posit that parental perspective taking is a contributing and protective factor to developing child empathy and that in the absence of abuse risk it has the potential to make a positive impact. The fact that the moderation analysis was non-significant and that these caregiver-child empathy associations were not apparent in the adopted group raises questions about what the relationship between caregiver and child empathy is when the child has experience of maltreatment. A larger sample of adopted children and their caregivers would help to clarify these findings. Based on the current findings, recommendations to encourage parental perspective taking in order to support child cognitive empathy development seem reasonable.

Another possibility to account for the limited intercorrelations in the adopted group between caregiver and child empathy, as well as the non-significant moderation analysis is that perhaps caregiver empathy is not the key influential factor in child empathy development. There are many other factors at play and that interrelate with empathy development such that focusing purely on parental empathy was perhaps too limited. For example, elsewhere research highlights the importance of parent-child attachment (Barone & Lionetti, 2012), relationship quality (Boele et al., 2019), caregiver gender (Boele et al., 2019), emotion regulation (Panfile & Laible, 2012), age at placement (Gabrielli et al., 2015), maltreatment type and severity (Baiden et al., 2017; Norman et al., 2012), and

foster care experience (Konijn et al., 2019; Lockwood et al., 2015). The findings suggest that there are not differential relationships between parent and child empathy depending on caregiving/maltreatment status. Perhaps instead these other factors are more influential in determining and contributing to inter-relationships between parent and child empathy. Moderation analyses incorporating other measures of these other constructs would be beneficial.

In the study there were unexpected significant differences between groups on measurements of caregiver empathy. Adoptive caregivers scored higher on empathic accuracy for the Negative videos in the EAT. Whilst these differences were unexpected, they do emphasize the sensitivity of the EAT measure in identifying difference. This finding can also be linked with another significant difference between caregiver groups on the IRI Personal Distress subscale. Biological parents scored significantly higher overall on the IRI Personal Distress subscale indicating that they experience more distress in response to another person's negative experiences than adoptive parents do. Together the EAT and IRI results indicate that the biological caregivers scored lower on empathic accuracy for negative emotions which could be explained by their lower threshold for coping with personal distress. This is in line with a socialization model of parenting such that parents who struggle to manage situations when they witness negative experiences in another will be less likely to apply effective regulatory and empathic strategies therefore reducing opportunity for modelling these strategies to their children to enable them to replicate them in similar situations (Hoffman, 1983; Eisenberg, et al. 1998). Adoptive parents are perhaps more likely to have been exposed to a greater number of situations that induce a sense of personal distress. For example, in line with vulnerabilities and behavioural, social and emotional outcomes commonly associated with a history of maltreatment, adoptive caregivers will have witnessed their adopted child experiencing distress or they may be aware of distress their child has experienced in the past (e.g., through records of maltreatment experiences). This experience and knowledge could alter the caregivers' thresholds for coping which, when paired with the training they will have received from adoption agencies, prepares them to manage these difficult situations effectively and empathically. Another interpretation is that adoptive caregivers possess a greater number of specific skills relating to empathy, in particular reduced personal distress and enhanced empathy in negative emotional situations, that deem them sensitive and nurturing caregivers for an adoption context.

A logical next step from this research would be using longitudinal research to better understand whether or not empathy is an area of development that shows a catch-up effect. This study found, through cross sectional methods, that maltreated and

subsequently adopted children do show a deficit on measures of state and trait empathy compared to non-maltreated controls. Further exploration relating to the role of sensitive developmental periods and whether there is scope for catch-up at different ages or following different types or frequency of maltreatment would add to this finding. It is also important to encourage research to compliment identification and understanding of risk factors through exploration of potential protective factors. This study considered caregiver empathy as one such protective factor.

3.4.1 Strengths and Limitations

This study would have benefitted from an additional group of at-risk children to give a more accurate indicator of the extent to which children's empathy benefits from not remaining in a maltreating environment.. This group could have been, for example, a currently institutionalised sample, at-risk families who scored high on a measure like the Brief Child Abuse Potential Inventory (B-CAP; Ondersma et al., 2005) indicating a potential for child maltreatment, or at-risk families identified within Child Protection Services or equivalent. However, inclusion of these vulnerable groups poses ethical dilemmas and difficulties. The decision to use a screening tool to confirm the presence and absence of maltreatment experiences for the adopted and biological group accordingly is a commonly used approach. The researcher had hoped to collaborate with the adoption agency whom they partnered with to gain access to records detailing the maltreatment experiences of the children to allow a sensitivity analysis by maltreatment type, severity, or frequency but unfortunately this was not possible for valid ethical reasons. Together, this raises the challenges and considerations that must be carefully and ethically made when researching the area of maltreatment. This study was completed in a way that prioritised the wellbeing of the participants and enquired sensitively and curiously about how past events impact on current behaviours.

Another strength of this research was inclusion of both state and trait, and self-, parent-, and child-report empathy measures. This study tried to overcome criticisms of a lack of agreement in measuring and conceptualising empathy (Main & Kho, 2020) by triangulating different measures. The benefit of state empathy (KEDS and EAT) measures selected is that they pose less reporter bias than questionnaires. Future studies should continue to use both types of measures and ideally have equitable samples for all measures. This study could have been further expanded by including measurements of empathy in other contexts such as peer relationships or empathy reported by others who know the child well (e.g., a teacher, coach, peer). This would allow for a broader

understanding of the impact of maltreatment on empathy in a range of contexts. It is possible that children may demonstrate varied levels of empathy depending on the circumstances and context. It may also be that impact of maltreatment and subsequent adoption differentially impacts other interrelated areas of empathy development. For example, Luke and Banerjee (2012) described how foster carers' narratives about their looked after children highlighted that although maltreated children may behave in a way that suggests they lack an empathic understanding to their peers they demonstrated skills relating to empathy in other contexts such as with the carer themselves. Accurate assessment of underlying empathy skills and consideration of application of these skills in a variety of contexts would account for individual differences generally but also especially indicate areas of potential strength on which interventions could build upon for maltreated children. This evaluation also highlights the importance in considering the multi-facetedness of empathy such that cognitive, affective, behavioural as well as state and trait classifications are made.

Sample size is a limitation. Due to the small sample size within the adopted group and within the state empathy (KEDS and EAT) measures, analyses were restricted. For example, it was not possible to include data from the KEDS and EAT measures in the correlational analyses thereby leaving a gap in understanding how and if an interrelationship between caregiver empathy and child state empathy differs between the adopted and biological groups. A larger sample size, particularly in the adopted group, would have allowed further analyses to be completed. It would also increase the power of the analyses aiding a better and more robust interpretation of findings. It contributes to a better understanding of the caregiver-child empathy relationship within an adoptive caregiver context. Increasing the sample size of this study would also have increased the variability in empathy assessments, specifically increasing the amount of non-questionnaire assessments. There are limitations in relying on self-report and parent-report questionnaires. McKenzie et al. (2021) found different group-level differences depending on which measure (IRI or EAT) of empathy was being examined in their comparison of those with and without a diagnosis of autism. This highlights a methodological strength of the current study in selecting both types of measures; it also reduces bias from having only parent-report measures. Although there was a small sample size for which both measures were available there were some group-level differences on the KEDS and the EAT. This gives an indication that these alternative measures have the potential to distinguish differences in aspects of child and caregiver empathy. It is unclear, however, whether they can distinguish different aspects to that assessed through questionnaire methods. Due to the small sample size the

intercorrelations between state (behavioural i.e., KEDS and EAT) and trait (questionnaire i.e., GEM and IRI) empathy measures were not possible but examination of these within a larger sample size would be worthwhile. This would develop a better understanding of the caregiver-child empathy relationship within an adoptive caregiver context.

3.4.2 Implications and Future Directions

There was a clear difference in child empathy such that maltreated children appear to score lower on empathy measures than their non-maltreated counterparts. This means that it is an important area to focus on when considering support for maltreated children. There were several significant intercorrelations between caregiver empathy and child empathy measures in the biological group. This provides two routes for next steps. Firstly, the understanding of links between caregiver and child empathy in a non-maltreating context could be useful starting points to consider what maltreated children need and would benefit from in adoptive environments. These pose viable skill areas to target in training for adoptive parents to encourage and promote child empathy development. For example, targeting development of empathic concern and perspective taking would be viable options. The former involves compassion, warmth and concern for others and the latter involves active attempts to perceive things from another person's point of view. These can be modelled whilst explicitly explaining conscious efforts and actions to engage with these skills by parents to their children, in line with a socialization model (Hoffman, 1983; Eisenberg, et al. 1998). They are also key experiences that all children should experience during their development. Secondly, the results could be interpreted as identifying a unique situation specific to a biological context such that further research, with a larger sample size of adoptees, is needed to clarify how the relationships in an adoptive caregiving context differ to non-maltreating, biological ones. It is interesting that there were no significant intercorrelations between caregiver and child empathy measures in the adopted group. Adopted children are likely making up for an interrupted and damaged start to life such that they may need what typically happens at earlier stages of empathy development when parents are modelling and emotionally socialising their children. Research with different age groups and comparison of the subtleties in different aspects of empathy would add to this understanding. Adoption agencies provide parents training to prepare and support adoptive parents; many of these focus on developing skills to enable them to foster positive attachments and understand their child's experiences using empathy. It would be interesting to collaborate with an adoptive agency to learn more about their training programs and assess the impact of different

components. It would also be of interest to consider the empathy of adoptive parents generally, at the point of making contact with an agency, and also its development in relation to any training programs they participate in.

The fact that the moderation analysis showed non-significant interactive effects of maltreatment status and caregiver empathy on child empathy and there were non-significant correlations between caregiver and child empathy in the adoptive group suggests that there are other areas of influence in a child's life contributing to their empathy. It could be that schools can offer a helpful and supportive space to encourage empathy development. Opportunities for modelling and practicing empathy in peer interaction settings are possible. Children also learn from their observations of other children so perhaps pairing children together to enable social learning from one another could be helpful. Schools should also be understanding of the difficulties maltreated children have with empathy which could pose challenges in skill like perspective taking. Differentiated approaches to behaviour management such as restorative justice which makes the wants and needs of those involved in altercations explicit could be a helpful framework for these children.

To conclude, this study hypothesised that there would be differences between adopted children with a history of maltreatment and non-maltreated biological children in state and trait empathy. It was also hypothesised that there would be an association between caregiver and child empathy and the way in which this inter-relationship differs between groups, or maltreatment status, was explored. The findings conclude that maltreated children do have difficulties with their empathy compared to non-maltreated biological controls and therefore need extra support and a sensitive understanding of their needs. There was not a significant interaction between caregiver and child empathy when group status was considered a moderator. It was surprising that caregivers significantly differed on their empathy and that adoptive caregivers scored higher on the state empathy measure (EAT). It highlights the different experiences maltreated children continue to have from their non-maltreated counterparts even following adoption. This study has a number of strengths including its methodological approach and conceptualisation of empathy, its recruitment of school age children and their parents, and its ethical strengths in sensitively enquiring about maltreatment experiences. Next steps include longitudinal research, broadening the context in which empathy is assessed, and considering mechanisms that contribute to empathy development in an adoptive context (e.g., training for adoptive caregivers and the role of schools).

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Appendix A PICOS Table

Table A1.

PICOS Table for Systematic Literature Review

	Include	Exclude
Population	✓ 0-25yo with a history of <u>postnatal</u> exposure to maltreatment*	× Adults aged 26y or over × 0-25yo with exposure only to prenatal adversity
Interventions	✓ Living in a family care setting that is not the one they were born into and someone other than the biological parent is the primary caregiver: ▪ care settings ▪ alternative caregivers ▪ foster care ▪ kinship care ▪ legal guardianship ▪ adoption	× Living in institutions (this is a form of adversity) × Living in alternative accommodation (e.g., homeless shelters) with parent × Experience of a natural disaster × Traumatic brain injury/parental mental health difficulties × Living with at least one biological parent × College students (presuming they live independently)
Comparators	✓ Living with at least one biological parent: ▪ Biological parent couples ▪ Single parents ▪ One biological parent living with a new partner (i.e., step-parent) ✓ No experience of postnatal adversity ✓ Experience of postnatal adversity and remain living with at least one biological parent or in an institution	× Living in a care or adoptive family setting
Outcomes	✓ Includes measures of the following that are compared between biological and alternative caregiver groups ▪ adversity/maltreatment (inc. population indices of adversity) ▪ categorisation of care setting ▪ emotion regulation**)	× Does not report any outcome specified in inclusion criteria

Study Design	✓ Comparison studies comparing groups that have/have not experienced adversity	× Within-maltreated sample correlations or comparisons (i.e., international vs. domestic adoption comparisons) × Case control designs × Studies without comparison groups × Qualitative studies × population studies that compare a group with ACEs

Appendix B Maltreatment Measures

B.1 ACE-Q

ACE-Q Items
1. Your child's parents or guardians were separated or divorced
2. Your child lived with a household member who served time in jail or prison
3. Your child lived with a household member who was depressed, mentally ill or attempted suicide
4. Your child saw or heard household members hurt or threaten to hurt each other
5. A household member swore at, insulted, humiliated, or put down your child in a way that scared your child OR a household member acted in a way that made your child afraid that s/he might be physically hurt
6. Someone touched your child's private parts or asked you child to touch their private parts in a sexual way
7. More than once, your child went without food, clothing, a place to live, or had no one to protect him/her
8. Someone pushed, grabbed, slapped or threw something at your child OR your child was hit so hard that your child was injured or had marks
9. Your child lived with someone who had a problem with drinking or using drugs
10. Your child often felt unsupported, unloved and/or unprotected
11. Your child was in foster care
12. Your child experienced harassment or bullying at school
13. Your child lived with a parent or guardian who died
14. Your child was separated from her/his primary caregiver through deportation or immigration
15. Your child had a serious medical procedure or life-threatening illness
16. Your child often saw or heard violence in the neighbourhood or in her/his school neighbourhood

17. Your child was often treated badly because of race, sexual orientation, place of birth, disability or religion.

B.2 Y-VACS

First Name: _____ Rater: _____

Child's ID: _____

Yale-Vermont Adversity in Childhood Scale (Y-VACS)
Hudziak, J.J. & Kaufman, J. (2014)

PARENT REPORT (PR)

Instructions: As much as we try to protect our children, bad things often happen to the ones we love. Children sometimes encounter a variety of different stressful experiences. For each of the following questions, please note in the Frequency column whether the experience happened to your child, and if it happened more than one time. If these experiences did happen, please record in the Severity column how severe you think they were. The first questions will focus on natural disasters, community, and health-related experiences.

Child's age: _____

Frequency:
0 = Never
1 = One time
2 = More than once

Severity:
1 = Mild or Suspected
2 = Moderate
3 = Severe

Frequency	Natural Disasters, Community, and Health-Related Experiences [Record ages when events occurred]	Severity
0 1 2	1. Was your child ever exposed to floods, tornadoes, hurricanes, earthquakes, or other natural disasters?	1 2 3
0 1 2	2. A serious fire?	1 2 3
0 1 2	3. War, armed conflict, or terrorism?	1 2 3
0 1 2	4. Was your child ever involved in a car or other accident resulting in serious injury or someone's death?	1 2 3
0 1 2	5. Did someone outside the immediate family that your child loved pass away?	1 2 3
0 1 2	6. Did your child ever require hospital care for a medical problem?	1 2 3
0 1 2	7. Has your child witnessed community violence?	1 2 3
0 1 2	8. Has your child been bullied?	1 2 3
0 1 2	9. Has a non-household, non-family member forced your child to watch or do something sexual?	1 2 3
0 1 2	10. Other: Specify.	1 2 3

First Name: _____ Rater: _____

Child's ID: _____

The following questions focus on different experiences related to you, your child, and immediate family and household.

Frequency	Family-Related Experiences [Record ages when events occurred]	Severity
0 1 2	1. Has your child ever been separated from his or her parents?	1 2 3
0 1 2	2. Has your child seen or heard adults in the household fighting?	1 2 3
0 1 2	3. Has a parent or other adult in the household ever been arrested or incarcerated?	1 2 3
0 1 2	4. Has your child ever lacked food, shelter, supervision, or routine or specialized medical care?	1 2 3
0 1 2	5. Has a parent or other adult in the household ever misused alcohol or drugs?	1 2 3
0 1 2	6. Has a parent or other household member attempted suicide or intentionally harmed him or her self?	1 2 3
0 1 2	7. Has an adult in the household ridiculed, rejected, or threatened your child?	1 2 3
0 1 2	8. Has an adult in the household hit, pushed, or thrown your child?	1 2 3
0 1 2	9. Has a parent, other adult in the household, or other family member forced your child to watch or do something sexual?	1 2 3
0 1 2	10. Other: Specify.	1 2 3

If you indicated that your child experienced any of the above, please indicate how old your child was when these events occurred:
0-5:____ 6-10:____ 11-15:____ 16-20: ____

Appendix C Demographic Statistics by Group

Group Statistics

	Are you the child's biological parent?	N	Mean	Std. Deviation	Std. Error Mean
What is your child's gender?	Yes	76	1.41	.495	.057
	No	29	1.55	.506	.094
Age_Of_Child_Years	Yes	76	8.6209	1.57392	.18054
	No	29	9.1709	1.65957	.30817
What is your gender?	Yes	75	1.93	.251	.029
	No	29	1.83	.384	.071
What is your role towards the child?	Yes	75	1.07	.251	.029
	No	28	1.18	.390	.074
Full Scale-2 Composite Score	Yes	14	114.3571	14.92343	3.98845
	No	7	95.0000	18.11997	6.84871

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
What is your child's gender?	Equal variances assumed	.417	.520	-1.324	103	.189	-.144	.109	-.359	.072
	Equal variances not assumed			-1.310	49.672	.196	-.144	.110	-.364	.077
Age_Of_Child_Years	Equal variances assumed	.032	.859	-1.577	103	.118	-.55002	.34872	-1.24161	.14158
	Equal variances not assumed			-1.540	48.390	.130	-.55002	.35716	-1.26799	.16796
What is your gender?	Equal variances assumed	10.460	.002	1.646	102	.103	.106	.064	-.022	.233
	Equal variances not assumed			1.372	37.615	.178	.106	.077	-.050	.262
What is your role towards the child?	Equal variances assumed	11.294	.001	-1.714	101	.090	-.112	.065	-.241	.018
	Equal variances not assumed			-1.413	35.693	.166	-.112	.079	-.273	.049
Full Scale-2 Composite Score	Equal variances assumed	.020	.889	2.613	19	.017	19.35714	7.40749	3.85310	34.86119
	Equal variances not assumed			2.442	10.218	.034	19.35714	7.92544	1.74900	36.96529

Appendix D Non-parametric Tests

Table A1

Non-Parametric (Mann-Whitney U Test) Statistics by Group

	Adopted Children		Non-adopted Children				
	N	*Mdn*	*N*	*Mdn*	*U*	*z*	*p*
Children's Empathy Measures							
GEM – Cognitive Empathy	27	32.00	72	41.50	**646.00**		**.010**
Parent Empathy Measures							
IRI – Personal Distress	26	7.00	68	12.00	**533.50**		**.003**
IRI – Perspective-Taking	26	20.50	68	20.00	884.50		.997
IRI - Fantasy	26	15.00	68	15.00	754.50		.273
IRI – Empathic Concern	26	23.00	68	22.00	961.00		.513

Correlations[a]

			GEA_Total_Scale	GEA_Cognitive_Scale	GEA_Affective_Scale	IRI_PersonalDistress_Scale_new2	IRI_PerspectiveTaking_Scale_New2	IRI_Fantasy_Scale_new2	IRI_EmpathicConcern_Scale_new2
Spearman's rho	GEA_Total_Scale	Correlation Coefficient	1.000	.776**	.765**	-.116	.516**	.147	.359**
		Sig. (2-tailed)	.	<.001	<.001	.347	<.001	.231	.003
		N	72	72	72	68	68	68	68
	GEA_Cognitive_Scale	Correlation Coefficient	.776**	1.000	.343**	-.082	.450**	.154	.310**
		Sig. (2-tailed)	<.001	.	.003	.507	<.001	.210	.010
		N	72	72	72	68	68	68	68
	GEA_Affective_Scale	Correlation Coefficient	.765**	.343**	1.000	-.062	.273*	.168	.138
		Sig. (2-tailed)	<.001	.003	.	.614	.024	.170	.263
		N	72	72	72	68	68	68	68
	IRI_PersonalDistress_Scale_new2	Correlation Coefficient	-.116	-.082	-.062	1.000	-.150	-.020	-.134
		Sig. (2-tailed)	.347	.507	.614	.	.221	.872	.276
		N	68	68	68	68	68	68	68
	IRI_PerspectiveTaking_Scale_New2	Correlation Coefficient	.516**	.450**	.273*	-.150	1.000	.170	.519**
		Sig. (2-tailed)	<.001	<.001	.024	.221	.	.166	<.001
		N	68	68	68	68	68	68	68
	IRI_Fantasy_Scale_new2	Correlation Coefficient	.147	.154	.168	-.020	.170	1.000	.173
		Sig. (2-tailed)	.231	.210	.170	.872	.166	.	.159
		N	68	68	68	68	68	68	68
	IRI_EmpathicConcern_Scale_new2	Correlation Coefficient	.359**	.310**	.138	-.134	.519**	.173	1.000
		Sig. (2-tailed)	.003	.010	.263	.276	<.001	.159	.
		N	68	68	68	68	68	68	68

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

a. Are you the child's biological parent? = Yes

Correlations[a]

			GEA_Total_Scale	GEA_Cognitive_Scale	GEA_Affective_Scale	IRI_PersonalDistress_Scale_new2	IRI_PerspectiveTaking_Scale_New2	IRI_Fantasy_Scale_new2	IRI_EmpathicConcern_Scale_new2
Spearman's rho	GEA_Total_Scale	Correlation Coefficient	1.000	.788**	.757**	-.055	.201	.202	.192
		Sig. (2-tailed)	.	<.001	<.001	.791	.324	.322	.348
		N	27	27	27	26	26	26	26
	GEA_Cognitive_Scale	Correlation Coefficient	.788**	1.000	.350	-.173	.250	.016	.124
		Sig. (2-tailed)	<.001	.	.073	.399	.217	.936	.545
		N	27	27	27	26	26	26	26
	GEA_Affective_Scale	Correlation Coefficient	.757**	.350	1.000	.139	.302	.488*	.121
		Sig. (2-tailed)	<.001	.073	.	.499	.134	.012	.556
		N	27	27	27	26	26	26	26
	IRI_PersonalDistress_Scale_new2	Correlation Coefficient	-.055	-.173	.139	1.000	-.177	.545**	-.038
		Sig. (2-tailed)	.791	.399	.499	.	.388	.004	.854
		N	26	26	26	26	26	26	26
	IRI_PerspectiveTaking_Scale_New2	Correlation Coefficient	.201	.250	.302	-.177	1.000	.106	.243
		Sig. (2-tailed)	.324	.217	.134	.388	.	.605	.232
		N	26	26	26	26	26	26	26
	IRI_Fantasy_Scale_new2	Correlation Coefficient	.202	.016	.488*	.545**	.106	1.000	.346
		Sig. (2-tailed)	.322	.936	.012	.004	.605	.	.083
		N	26	26	26	26	26	26	26
	IRI_EmpathicConcern_Scale_new2	Correlation Coefficient	.192	.124	.121	-.038	.243	.346	1.000
		Sig. (2-tailed)	.348	.545	.556	.854	.232	.083	.
		N	26	26	26	26	26	26	26

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

a. Are you the child's biological parent? = No

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