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Investigating Psychological Influences on Parental Reflective Functioning

by

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Thesis for the degree of Doctor of Clinical Psychology

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Abstract

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Parental reflective functioning describes the ability of a parent or caregiver to interpret their child's behaviour as motivated by internal mental states different to their own, and to recognise how the parent and child's mental states influence their interactions and relationship. More sophisticated reflective skills are associated with greater confidence in the parent/caregiver role, whilst poorer parental reflective functioning has been linked to higher levels of caregiver stress. Theory suggests that capabilities for parental reflective functioning develop in the context of the adult's early relationships and attachment to their own parent. However, a 'loose coupling' exists between adult attachment style and parental reflective functioning, whereby insecure attachment is associated with poorer parental reflective functioning, yet the quality of parental reflective functioning is varied amongst securely attached individuals. This suggests that other factors, beyond attachment style, influence an individual's level of parental reflective functioning.

A systematic review was conducted to identify and evaluate existing research on psychological characteristics related to increased or reduced parental reflective functioning in healthy populations. Fourteen studies were identified encompassing four main areas of research: Personality; emotion regulation; parenting and executive function. Emotion regulation was the most frequently researched area, and emotion regulation difficulties were consistently associated with poorer parental reflective functioning. On the basis of these findings, and empirical study was conducted to examine the relationships between attachment dimensions, emotional dysregulation and PRF, and how these relate to caregiver stress amongst foster carers. Seventy-three foster carers participated in an online study assessing attachment, difficulties with emotion regulation, parental reflective functioning and caregiver stress. The results suggest that parental reflective functioning predicts caregiver stress, and that attachment dimensions and emotion regulation also have a role in this association. Overall, the results add to the existing literature attachment, emotion regulation and parental reflective functioning. Several areas for future research are identified, including ways in which interventions to improve parental reflective functioning could be improved.

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Research Thesis: Declaration of Authorship

Print name: Alexandra Hannah Thorpe

Title of thesis: Investigating Psychological Influences on Parental Reflective Functioning

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.

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Definitions and Abbreviations

ERGO	Ethics and Research Governance Online
GDPR	General Data Protection Regulation
PRF	Parental Reflective Functioning
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta Analyses
SPSS	Statistical Package for the Social Sciences
SWiM	Synthesis Without Meta Analysis

Chapter 1 Which Intrapersonal Psychological Characteristics are Associated with Increased or Reduced Parental Reflective Functioning? A Systematic Review.

The following paper has been prepared in line with the author guidelines for the journal Attachment and Human Development.

1.1 Abstract

Parental Reflective Functioning (PRF) is implicated in the intergenerational transmission of attachment styles. However, a 'loose coupling' between adult attachment style and PRF has been observed, suggesting that additional factors influence PRF abilities, beyond attachment style. This systematic review therefore aimed to collate and appraise evidence on psychological characteristics related to increased or reduced parental reflective functioning within healthy populations. A systematic search was conducted across EBSCOhost (APA PsycINFO, APA PsycArticles, CINHAL, MEDLINE), Scopus and Web of Science. Fourteen eligible studies were identified. Methodological quality was assessed using the QualSyst tool, and data were presented in a narrative synthesis. Four main areas of existing research were identified: Personality; emotion regulation; parenting and executive function. Emotion was the most frequently researched area, and difficulties with emotion recognition and regulation were most consistently associated with poorer PRF. Replication and extension of the existing research is required to improve current understanding of psychological characteristics influencing PRF, and potential roles for such characteristics in promoting improved PRF.

Keywords: Parental Reflective Functioning, Mentalization Parenting, Emotion regulation, Personality, Executive Function

1.2 Introduction

1.2.1 Attachment as a Public Health Issue

Attachment is understood to play a vital role in healthy development, as an infant's relationship with their caregiver provides the context for learning to regulate physiology, emotion and behaviour (Bowlby, 1969; Main, 1985). Secure attachment is associated with a plethora of lifelong advantages, including socioemotional competence (Ranson & Urichuk, 2008), resilience (Darling Rasmussen et al., 2019) and life satisfaction (Li et al., 2020). Conversely, individuals with insecure attachment are overrepresented in mental health settings (Mikulincer & Shaver, 2007). Therefore, promoting the development of secure attachment has a vital role in the promotion of healthy child development and the prevention of mental health problems. Achieving these aims requires consideration of the context in which attachment patterns develop.

1.2.2 Intergenerational Attachment: The Transmission Gap

Attachment styles are widely assumed to be passed between generations (Main et al., 1985), and relationships between the attachment styles of parents and their children have been consistently observed (van Ijzendoorn, 1995). However, an exact mechanism for this intergenerational transmission remains elusive; a problem coined the transmission gap (van Ijzendoorn, 2019). Parenting sensitivity: the parent's ability to notice, correctly interpret and appropriately respond to the child's needs (Ainsworth et al., 1974), plays a central role in the development of the child's attachment style (De Wolff & van Ijzendoorn, 1997). However, parents' attachment style was found to account for only 12% of the variance in their sensitivity towards their child (van Ijzendoorn, 1995). Therefore, additional parental and contextual factors may influence the relationship between a parent's attachment style and their sensitivity towards the child (Verhage et al., 2016).

Subsequently, various psychosocial stress factors have been investigated as potential influences on parenting sensitivity, as adversities may undermine parenting abilities (Dix, 1991). These have included maternal mental health symptoms, socioeconomic status and parental stress. Nonetheless, perhaps owing to the broad-reaching nature of social factors, a recent meta-analysis revealed that these effects were also small, accounting for 1.4 – 10.2% of the variance in maternal sensitivity (Booth et al., 2018). This suggests that influences on parenting sensitivity are manifold and complex (Booth et al., 2018), indicating a need to identify further influences on sensitivity at all ecological levels.

Additionally, it has been argued that parenting sensitivity is a problematic construct, as this refers to global features of a parent's behaviour (Kelly et al., 2005), and focusses less on the parent's perception of the child (Meins, 1999), making it difficult to isolate mechanisms implicated in the transmission of attachment. Suggestions have therefore been made to refine the concept of sensitivity to focus on discrete cognitive processes theorised to facilitate sensitive behaviour, such as mentalization (Zeegers et al., 2017). Mentalization, the ability to consider others' internal states (Premack & Woodruff, 1978), has been found to predict parenting sensitivity, influencing the child's attachment security both directly and indirectly via sensitivity (Zeegers et al., 2017). Although several conceptualisations of parent mentalization have been presented (Zeegers et al., 2017), the concept of parental reflective functioning (PRF) has received particular attention in relation to the intergenerational transmission of attachment.

1.2.3 Parental Reflective Functioning and the Loose Coupling Hypothesis

Parental Reflective Functioning refers to the ability of the parent to interpret their child's behaviour as motivated by internal mental states different to their own, and to recognise how their own mental states are influenced by their interactions with the child (Luyten et al., 2017[A]). It is conceptually related to reflective function (Fonagy et al., 1991), but within the specific context of the parent-child

relationship. Unlike other parent mentalization concepts, PRF has a relational focus, requiring consideration of the interactions between the mental states and behaviour of both parent and child, extending beyond an understanding of the child alone (Slade, 2005). PRF is comprised of three components. Pre-mentalising represents the parent's ability (or difficulty) to consider the child's internal world and make appropriate attributions of the child's behaviour. Certainty of mental states refers to the extent of the adult's confidence in their understanding of the child's mind, and their understanding that others' mental states are 'opaque' and can only be inferred. Therefore, the degree of certainty may be excessive or insufficient. The last component, interest and curiosity, comprises the extent of the adult's active curiosity and willingness to understand the child's mental states. Therefore, PRF is conceptualised as the metacognitive skill which allows the parent to demonstrate parental sensitivity (Fonagy & Target, 1997; Slade et al., 2005).

It is proposed that the capacity for reflective functioning develops within the context of attachment relationships, as an individual's early experience of relationships organises their understanding of others' intentions and behaviours (Bowlby, 1988; Fonagy & Target, 1997). This is empirically supported by findings that adults with a secure attachment style show greater reflective function than insecurely attached adults (Fonagy et al., 1991). However, a 'loose coupling' between adult attachment style and PRF has been observed, whereby insecure attachment is associated with poorer PRF, yet securely attached individuals showed varied levels of PRF (Sharp & Fonagy, 2008; Luyten et al., 2017[A]). This suggests that additional factors influence the development of, or capacity to access PRF, beyond attachment style. Given the wide-reaching effects of attachment on psychological functioning (Moretti et al., 2004), it is pertinent to understand the influence of psychological factors on increasing or reducing PRF. This understanding may contribute to models explaining the intergenerational transmission of attachment, and enhance understanding of how to promote the development of PRF and therefore secure attachment in the next generation.

1.2.4 Aims of the Review

This review aims to systematically collate and appraise evidence on psychological characteristics related to increased or reduced parental reflective functioning, evaluate the quality of the existing evidence, and identify areas for further research. As PRF is a relatively newly described concept, it is pertinent to gather information on these associations within healthy and typically developing populations, to inform a preliminary understanding of these links. Influences on PRF may differ or be more complex amongst populations experiencing greater stresses or adversity, such as the parents of children with mental health, developmental or physical illness or disability. Therefore, the review aims to answer the following research question:

Which intrapersonal psychological factors are associated with increased or reduced parental reflective functioning in healthy parents of healthy children?

1.3 Materials and Methods

1.3.1 *Systematic review*

The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta analyses (PRISMA; Page et al., 2020) and Synthesis Without Meta Analysis (SWiM; Campbell et al., 2020) guidelines. The review protocol was registered in advance (Prospero ID: CRD42022373087). Scoping searches, conducted in August 2022 on PsycINFO, confirmed there were no prior systematic reviews using this research question, and indicated a systematic search would identify sufficient material to address the research question. However, it was unlikely there would be sufficient homogeneity in research design and statistical analysis to conduct a meta-analysis. The search strategy was developed using both keywords and subject headings, to improve sensitivity by capturing synonyms (Boland et al., 2017). A set of 10 papers which met the inclusion criteria were used to test the sensitivity of the search strategy.

The systematic search was conducted in November 2022, across EBSCOhost (APA PsycINFO, MEDLINE) and Web of Science. The search strategy comprised both keywords and, in EBSCOhost, subject headings. Subject headings are not available in Web of Science. Keywords and subject headings were chosen to capture a broad range of terms related to PRF, to ensure a sensitive search. There were no restrictions on publication period. Search terms are shown in Table 1.

Table 1: Search terms

	Free text	Subject headings
Terms for mentalization	"reflective Function*" OR mentaliz* OR mentalis* OR "mind minded" OR "mind mindedness" OR "parent* sensitivity" OR sensitive parenting" OR "maternal sensitivity" OR "paternal sensitivity"	Mentalization
Terms for the population	parent* OR carer* OR caregiver* OR mother* OR father*	Parents, mothers, fathers, caregivers
Terms for influences	correlat* OR factor* OR moderat* OR mediat* OR associat* OR reduc* OR increas* OR decreas* OR relat* OR predict*	

Eligibility Criteria

Articles were required to report primary empirical research employing quantitative methods and to be published in a peer-reviewed journal with an available full-text in the English language. Qualitative studies, review articles, editorials, book reviews or commentaries, study protocols, posters or presentations were therefore excluded. There were no restrictions on geographic location or cultural group. The review focused on healthy birth parents of healthy children; therefore, parents

of children with physical, mental health or neurodevelopmental conditions, parents with diagnosed physical or mental health or substance misuse problems, adoptive or foster parents, and professional carers who did not live with the children they cared for (e.g. in residential homes or hospitals) were all excluded. Additionally, studies were required to investigate an association between PRF and other psychological characteristics within the parent; therefore, studies solely reporting biological or social factors, or child outcomes, were excluded (see Table 2).

Table 2: Inclusion and Exclusion criteria

	Inclusion Criteria	Exclusion Criteria
Publication Type	• Empirical studies employing quantitative methods • Articles must be peer reviewed • Articles must be written in the English language • A full text must be available	• Qualitative studies • Narrative reviews • Editorials, book reviews or commentaries • Study protocols • Non-peer-reviewed papers or conference presentations
Population	• Healthy birth parents of healthy children (drawn from a general population with no diagnosed physical or mental health conditions)	• Parents with mental health diagnoses • Parents engaging in substance misuse • Parents considered 'at risk' for social services involvement • Parents of children with mental health problems, developmental disabilities or chronic physical health conditions • Expectant parents
Outcomes of interest	1. Includes a standardised measure of parental reflective functioning: - Parental Reflective Functioning Questionnaire - Reflective Functioning scale applied to the Parent Development Interview And 2. Psychological factors within the individual parent associated with increased or parental reflective functioning.	1. No appropriate measure of Parental Reflective Functioning - Other mentalizing construct - Reflective Functioning scale applied to the Adult Attachment Interview (therefore not specific to the parenting role) 2. Studies not investigating relationships between Parental Reflective Functioning and intrapersonal psychological characteristics in the parent e.g. investigating biological, behavioural, environmental or social factors, or child characteristics

1.3.2 Data Screening, Selection and Extraction

Screening and selection were managed using EndNote reference management software (Clarivate, 2013). Duplicates were removed, and the title and abstracts of studies were screened to identify

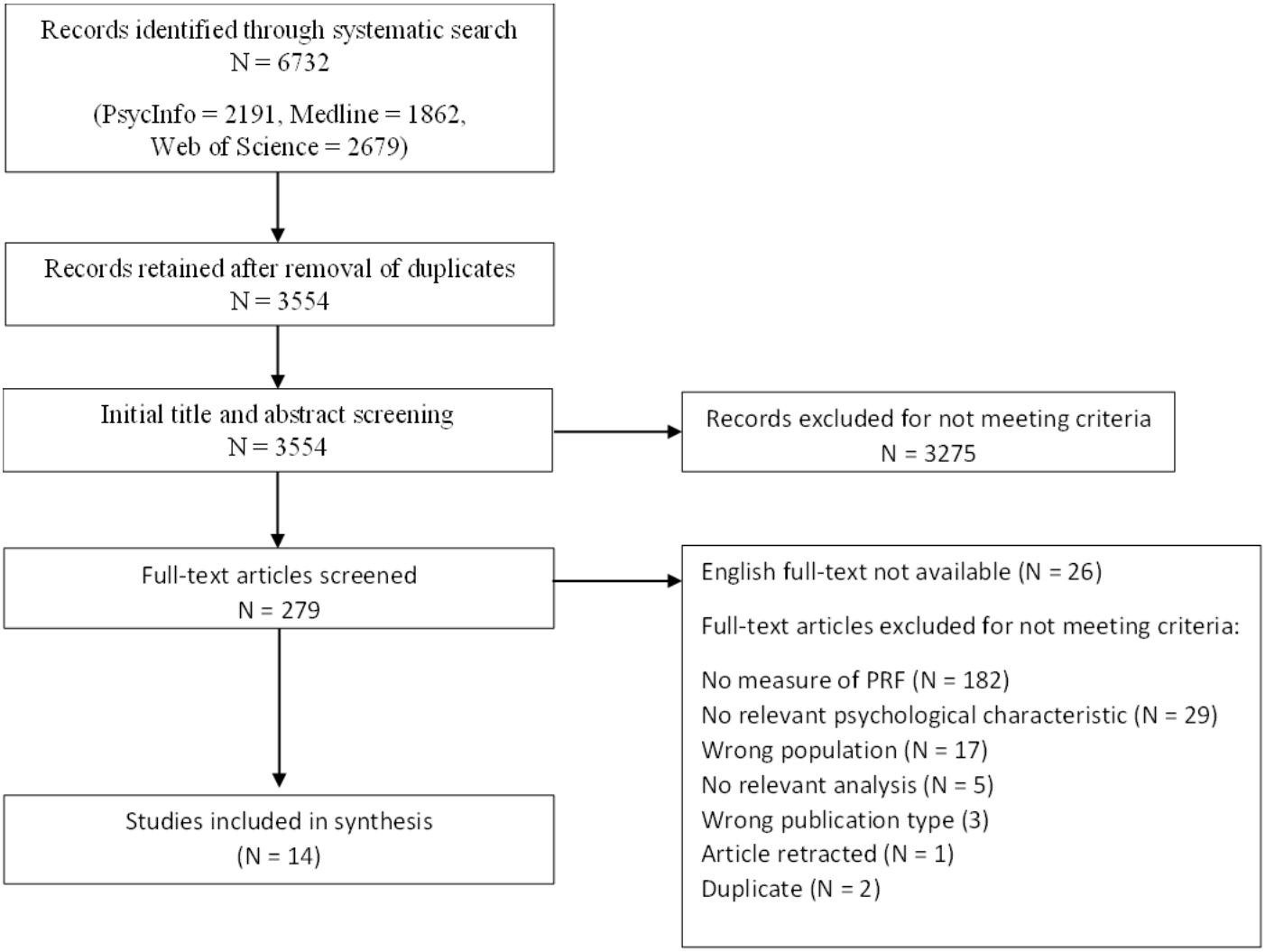
potentially eligible articles. Full-texts of retained articles were then retrieved and assessed for eligibility. A second reviewer screened ten percent of the title and abstracts and a quarter of the full texts to establish eligibility. The two reviewers were blind to each other's decisions. Concordance of 95% was achieved for the title and abstract screening, and 72% for the full-text screening. This is deemed acceptable for exploratory research (Neuendorf, 2002). Disagreement at the full-text stage was due to the second reviewer being unfamiliar with the measures used to assess PRF and therefore being more inclusive. Disagreements were resolved by discussion with a third reviewer. A PRISMA flow diagram illustrates this process in Figure 1.

A pre-piloted form was used to extract data from the eligible studies for assessment of quality and to facilitate data synthesis.

1.3.3 Quality Assessment

The quantitative version of the QualSyst Tool (Kmet et al., 2004) was used to evaluate the quality of eligible studies. This is a validated tool developed specifically to evaluate a broad range of study designs concurrently, which was advantageous, as study designs were expected to vary. The tool comprises 14 individual criteria addressing design, methodological and reporting issues, including sampling, appropriateness of measurement tools, presence of confounds and statistical analysis. The tool yields an overall quality score, expressed as a percentage, but does not specify thresholds for an acceptable level of quality. Therefore, summary scores were expressed as a percentage, and categorised as 'excellent' (> 80%), 'good' (70%– 79%), 'adequate' (55% - 69%) or 'low' (<55%), in line with previous reviews (Castellucci et al., 2020). Quality assessment was undertaken by the main researcher, and 36% of the included studies (N = 5) were also rated by a second reviewer, with good agreement (80.00%). Discrepancies were due to the main researcher giving more stringent ratings. No adaptations were made to the quality assessment tool.

Figure 1: PRISMA Diagram to Illustrate the Flow of Results



1.4 Results

1.4.1 Study Characteristics

Fourteen studies met all inclusion criteria and were therefore retained. The PRISMA flow diagram (Figure 1) illustrates this process, and an overview of the included studies is presented in Tables (5-8). These studies were published in peer-reviewed journals between 2013 and 2022. The studies were conducted across a broad geographical area (see tables 5-8), with eight conducted in North America, and the remainder across the Middle East, Europe, Scandinavia and Australia. The

majority were cross-sectional observational studies (N = 10), and the remaining were intervention studies (N = 3), with one experimental study. Most studies (N =12) used correlation and regression analysis, whilst others also used path analysis (N = 1), moderated mediation (N = 1) and structural equation modelling (N = 1). A list of the psychometric measures employed by these studies is presented in Tables 3-4. The measures used to assess psychological characteristics were diverse, each being used in a maximum of two studies. Detailed in the PRISMA flow diagram, five studies appeared to meet the inclusion criteria but employed an unsuitable analysis. Of these, four collected data on PRF and a relevant psychological characteristic but did not test for an association between them, whilst one did explore such an association but amalgamated data from the Parental Reflective Functioning Questionnaire (PRFQ; Luyten et al., 2017[B]) with a measure of parental stress, and did not report the PRFQ separately, so no data could be extracted.

1.4.2 Participant Characteristics

The overall sample size was 5730, with individual sample sizes ranging from 21 - 1882. Nine studies only included mothers. Amongst the five studies which included both parents, the gender balance ranged from 28 - 94% mothers. The mean age of participants was reported by 12 studies, and ranged from 27.0 to 37.5 years. Ethnicity was reported by seven studies, whilst two studies reported nationality. Of those reporting ethnicity, the largest group were white in five studies (42.8 - 79.8% of participants) and African American in two studies (48 – 53%). The studies reporting nationality had an Australian majority (79%) and an Israeli majority (75%). Recruitment strategies included recruitment through health services, advertising in schools and community services, and targeted sampling using commercially-owned digital research platforms. The variation in sampling strategies, and their description, is reflected in each study's quality assessment score (see Tables 5-8).

1.4.3 Quality Assessment

In line with the QualSyst tool guidance (Kmet et al., 2004) and in order to provide a comprehensive overview of the available literature, studies were not excluded on the basis of quality.

Quality assessment scores ranged from 60 – 95%, and therefore the overall evidence ranged from adequate to excellent. Areas of strength included the use of standardised psychometric measures, whilst common areas of weakness were recruitment methods that may have led to less representative samples (such as using only one recruitment method or recruiting from paid survey platforms), and failure to report correcting for multiple statistical testing.

Table 3: Measures of Parental Reflective Functioning

Measure	Abbreviation	Authors	Construct(s) Assessed	Structure	No. Items	No. Studies used By
Parental Reflective Functioning Questionnaire	PRFQ	Luyten et al. (2017[B])	Parental Reflective Functioning	Global score and three subscales: 1. Pre-mentalizing modes; 2. Certainty of Mental States 3. Interest and Curiosity;	39 or 18 item versions	39 item: 1 18 item: 9
Parental Reflective Functioning Questionnaire - Finnish	PRFQ-FI	Pajulo et al. (2018)	Parental Reflective Functioning	Total score and four subscales: 1. Interest and curiosity in child's individual mental states 2. Understanding the opaque nature of mental states 3.Appropriateness of reasoning about mental states underlying child's reactions 4. Acknowledging the uncertainty in interpreting child's mental states	14	1
Reflective Functioning Scale applied to the Parent Development Interview	PRF/PDI	Fonagy et al. (1998); Slade et al. (2007)	Parental Reflective Functioning	20 interview questions, scored 1-9, yielding one global score for PRF. Coding based on four categories: 1. Awareness of the opacity of mental states 2. An effort to understand self and others' mental states 3. Recognition of developmental influences of mental states 4. Consideration of the interviewer's mental states	N/A	3

Table 4: Measures of Psychological Characteristics

Domain	Measure	Abbreviation	Authors	Relevant Construct(s) Assessed	Structure	No. Items	No. Studies used By
Personality	Balanced measure of psychological needs	BMPN	Sheldon & Hilpert (2012)	Connectedness	Three subscales: 1. Relatedness (connectedness) 2. Competence 3. Autonomy	18 (6 items on the Relatedness scale)	1
	Brief Symptom Inventory	BSI	Derogatis (1992)	Hostility	Nine dimensions, including hostility	53 (5 items on the Hostility dimension)	1
Emotion	Baby Simulator Paradigm	BSIM	Rutherford et al. (2013)	Tolerance for an Infant's Distress	Behavioural task in which participants are instructed to soothe a simulated infant, programmed to be inconsolable. Scored by the length of time participants persist on the task.	N/A	2
	Computerised Paced Auditory Serial Addition Task	PASAT-C	Lejuez et al. (2003)	Distress Tolerance	Timed mental arithmetic task with three levels of difficulty. Scored by the length of time participants persist on the task.	N/A	2
	Difficulties in Emotion Regulation Scale	DERS	Gratz & Roemer (2004); Kaufman et al. (2016)	Emotional Dysregulation	Global score and six subscales: 1. Non-acceptance of emotional responses (Non-acceptance) 2. Difficulty engaging in goal-directed behaviour (Goals) 3. Impulse control difficulties (Impulse) 4. Lack of emotional awareness (Awareness) 5. Limited access to emotion regulation strategies (Strategies) 6. Lack of emotional clarity (Clarity)	36 or 18 item versions	36 items: 2 18 items: 2

	Emotion Regulation Questionnaire	ERQ	Gross & John (2003)	Emotion Regulation	Two subscales: 1. Cognitive Reappraisal 2. Expressive Suppression	10	2
	Distress Tolerance Scale	DTS	Simons & Gaher (2005)	Distress Tolerance	Four subscales: 1. Tolerance of distress 2. Appraisal of distress 3. Absorption by distress 4 Regulation of distress.	15	1
	Toronto Alexithymia Scale	TAS-20	Bagby et al. (1994)	Alexithymia	Total score and three subscales: 1. Difficulty identifying feelings 2. Difficulty describing feelings 3. Externally-oriented thinking	20	1
Parenting	Parental Beliefs about Feelings Questionnaire	PBAF	Dunsmore & Karn (2001)	Parents' attitudes to managing their child's feelings	Total score and two subscales: 1. Emotional language 2. Developmental Beliefs	23	1
	Parent Coping Scale	PCS	Ghate (2018)	Perception of Coping in the Parent Role	Single Item measure	1	1
	Parental Locus of Control Questionnaire	PLOC	Campis et al (1986)	Locus of Control in the Parent Role	Five subscales: 1. Parental Efficacy 2. Parental Responsibility 3. Child Control of Parent's Life 4. Fate/Chance 5. Parental Control of Child's Behaviour	17	1
	Parent Modernity Scale	PMS	Schaefer & Edgerton (1985)	Attitudes towards Parenting	Two subscales: 1. Traditional Parenting Beliefs 2. Progressive Parenting Beliefs	30 items (23 items after omitting items only relevant to school-age children)	1
	Parental Sense of Competence Scale	PSOC	Johnston & Mash (1989)	Perceived Parental Efficacy	Global score and two subscales: 1. Satisfaction 2. Efficacy	17	2
Executive Function	Corsi Block Tapping Task	N/A	Milner (1971)	Visuospatial working memory	Overall accuracy score generated	N/A	1
	Digit Span (WAIS)	N/A	Wechsler (1981)	Verbal working memory	Overall accuracy score generated	N/A	1

Two-back task	N/A	Westerman et al (2001)	Visual working memory	Overall accuracy and response speed score generated	N/A	1
Card-sorting task	N/A	Westerman et al (2001)	Set-shifting	Overall accuracy score generated	N/A	1
N-back task	N/A	Jonides et al (1997)	Updating	Overall accuracy score generated	N/A	1
Cued task-switching	N/A	Meiran (1996)	Set-shifting	Overall accuracy score generated	N/A	1
Antisaccade Task	N/A	Friedman & Myaki (2004)	Response Inhibition	Overall accuracy score generated	N/A	1
Flanker Task	N/A	Eriksen & Eriksen (1974)	Resistance to interference	Reaction times calculated	N/A	1

1.4.4 Synthesis

The psychological characteristics assessed in each study were grouped into four overarching domains: Personality; emotion; parenting and executive function. This was an inductive process based on the results of the search, rather than a pre-determined framework. Figure 2 presents an overview of the characteristics included in each domain. A summary of the data extracted from each study is presented in Tables 5-8, organised by psychological domain. Each study was found to address one domain only, and therefore is presented only once. The evidence available in each domain is presented in a narrative synthesis, commenting on the research findings in relation to each psychological characteristic, taking into account the quality, quantity and consistency of evidence available. For correlational data, effect sizes were interpreted using Cohen's (1988) criteria, whereby $r = .10$ is considered small, $r = .30$ medium and $r = .5$ large. For regression coefficients, there is currently no consensus on appropriate thresholds for effect size interpretations, as coefficients are calculated based on variance within a model and therefore not directly comparable between models (Kline, 2016). Where available, evidence is reported in relation to overall PRF, followed by its subcomponents, pre-mentalizing modes, certainty of mental states and interest and curiosity.

Table 5: Personality

Authors and date	Country	QA Score	Design	Sample Size	Psychological characteristic	Measure of PRF	Analysis	Relevant Findings	Test statistic
Arikan & Kumru (2021).	Turkey	95%	Cross-sectional	537 mothers	Hostility (Brief Symptom Inventory)	PRFQ (39 items)	Correlation, Path Analysis	1. Hostility was significantly negatively correlated with PRF.	1. r = -.11*
Nelson-Coffey, Johnson & Coffey (2021).	USA	75%	Experimental Study	614 (70% mothers, 30% fathers)	Connectedness (Balanced Measure of Psychological Needs - 18 item); Meaning in Life (Daily Meaning Scale);	PRFQ (18 items)	Moderated mediation	Connectedness predicted lower pre-mentalizing (1) and greater Certainty of Mental States (2), but did not predict Interest and Curiosity (3) amongst individuals with higher attachment anxiety only.	1. *b*= -0.34** 2. *b*= 0.32** 3. *b*=0.08.

**. Correlation is significant at the 0.01 level
*. Correlation is significant at the 0.05 level

Table 6: Emotion

Authors and date	Country	QA Score	Design	Sample Size	Psychological characteristic	Measure of PRF	Analysis	Relevant Findings	Test statistic
Ahrnberg, Pajulo, Scheinin, Karlsson, Karlsson & Karukivi (2020)	Finland	90%	Cross-sectional	1882 mothers 994 Fathers (analysed separately)	Alexithymia (Toronto Alexithymia Scale, TAS-20)	PRFQ (Finnish; PRFQ-Fi, 14 items)	Correlation (Spearman's rho); Regression	Alexithymia was associated with lower PRF. 1. All TAS-20 scales were significantly negatively correlated with the PRFQ-FI total score, except for Difficulty Identifying Feelings for mothers, which was non-significant. 2. Significant negative correlations were observed between all TAS-20 subscales and PRFQ-FI factors 1 and 3. 3. All TAS-20 scales were significantly positively correlated with PRFQ-FI factor 2, except Externally-oriented thinking, which was non-significant and negative. 4. All correlations between TAS-20 subscales and PRFQ-FI factor 4 were non-significant and negative. Regression: Higher TAS-20 scores were associated with lower PRFQ-FI total scores for mothers (5) and fathers (6). This association was driven by Externally Oriented	1. Mothers: r = -.077* - -0.242**, -.035 Fathers: r = -.119** - -.323** 2. Mothers: r = -.154** - .396** Fathers: r = -.183** - -.400** 3. Mothers: r = .104** - .162**, -.023 Fathers: r = .081* - .136**, -.037 4. Mothers: r = .011 - .035 Fathers: r = -.008 - -.046 5. β = -0.139** 6. β = -0.278** 7. β = -0.223*** 8. β = -0.299***

							Thinking only, for both mothers (7) and fathers (8).	
Moreira & Fonseca (2022).	Portugal	95%	Cross-sectional	710 mothers	Emotional dysregulation (DERS, 18 items)	PRFQ (Portuguese; 18 items)	Correlation	Difficulties in emotion regulation were associated with lower PRF. 1. All subscales of the DERS were significantly positively correlated with Pre-mentalising. 2. All subscales of the DERS were significantly negatively related to Certainty of Mental States. 3. The Non-acceptance, Awareness and Impulse subscales of the DERS were significantly negatively correlated with Interest and Curiosity, whilst all other DERS subscales were non-significantly negatively correlated.	1. r = .14** - .025**. 2. r = -.11** - -.28**. 3. r = -.08*, -.26**, -.003 - -.08.
Wang (2022)	USA	90%	Cross-sectional	202 parents	Emotional dysregulation (Difficulties in Emotion Regulation Scale, DERS, 18 item)	PRFQ (18 items)	Structural Equation Modelling	1. Difficulties in emotion regulation significantly predicted greater Pre-mentalising. 2. Emotion regulation did not significantly predict Certainty of Mental States. 3. Greater difficulties in emotion regulation significantly predicted lower Interest and curiosity.	1. β = 0.47*** 2. β =0.02 3. β =-0.26**
Schultheis, Mayes, & Rutherford (2019).	USA	75%	Cross-sectional within a prospective study	97 mothers	Emotion regulation (Emotion Regulation Questionnaire, ERQ, 10 item); Emotional dysregulation (Difficulties in Emotion	PRFQ (18 items)	Correlation; Regression	Correlation: 1. Reappraisal on the ERQ was significantly negatively correlated with Pre-mentalising only. 2. Suppression on the ERQ was significantly positively correlated with Pre-mentalising only. 3. All subscales of the DERS, and the DERS total score, were significantly positively correlated with Pre-mentalising.	1. r = -.21* 2. r =.25* 3. r =.26* - .49**

					Regulation Scale, DERS, 36 item)			4. Only the goals subscale of the DERS showed a significant relationship with Certainty of Mental States, which was negative. 5. Lack of emotional awareness alone was significantly negatively related to Interest and Curiosity. Regression: 6. Suppression and Reappraisal significantly predicted Pre-mentalizing. 7. Increased non-acceptance and lack of emotional clarity predicted pre-mentalising. 8. Lack of emotional awareness predicted lower Interest and Curiosity when controlling for maternal education. 9. Difficulty pursuing goals was significantly associated with lower Certainty of Mental States when controlling for maternal age.	4. r = -.21* 5. r = -.37* 6. β=0.04**, β=-0.02** r^2 = 0.12 7. β=0.01** β=0.01* r2=0.23 8. β=-0.72**, r2=.16 9. β=-0.7*, r2=.11
Zimmer-Gembeck, Kerin, Webb, Gardner, Campbell, Swan & Timmer (2019).	Australia	80%	Intervention Study	90 parents	Emotion regulation (Emotion Regulation Questionnaire, RQ, 10 item); Emotional dysregulation (Difficulties in Emotion Regulation Scale, DERS, 36 item)	PRFQ (18 items)	Correlation	1. Improvements in cognitive reappraisal (ERQ) were significantly correlated with improved Interest and Curiosity, but was not significantly related to Pre-mentalising or Certainty of Mental States. 2. Improvements in emotion suppression (ERQ) were significantly correlated with improvements in Pre-mentalising, but not significantly related to Interest and Curiosity or Certainty of Mental States. 3. Improvements in emotional dysregulation (DERS) were significantly correlated with	1. r =.36**, -.05, .02 2. r =.23*, .15, .01 3. r =.20*, .17, .11

							improvements in Interest and Curiosity only, and was not significantly related to Pre-mentalising or Certainty of Mental States.	
Rutherford, Goldberg, Luyten, Bridgett, & Mayes (2013).	USA	80%	Cross-sectional	21 mothers	Distress Tolerance (Computerised Paced Auditory Serial Addition Task, PASAT-C; Baby Simulator Paradigm, BSIM)	PRFQ (18 items)	Correlation (Spearman's rho)	Tolerance for a simulated infant's distress, but not general distress, was related to the Interest and Curiosity aspect of PRF. 1. Persistence times on the BSIM showed a significant positive correlation with Interest and Curiosity. 2. Persistence times on the BSIM were non-significantly negatively correlated with Pre-mentalizing and Certainty of Mental States. 3. Persistence times on the PASAT-C did not correlate significantly with any PRF subscale.	1. r =.51* 2. r = -1.2- -1.4 3. r = <.14.
Rutherford, Booth, Luyten, Bridgett & Mayes, (2015).	USA	60%	Cross-sectional	59 mothers	Distress Tolerance (Distress tolerance Scale, DTS; Computerised Paced Auditory Serial Addition Task, PASAT-C; Baby Simulator Paradigm, BSIM)	PRFQ (18 items)	Correlation	Self-reported distress tolerance was related to lower Pre-mentalizing. 1. The tolerance, absorption and appraisal subscales of the DTS were significantly negatively correlated with Pre-mentalizing, whilst the regulation subscale showed a non-significant positive correlation. 2. All correlations between the DTS subscales and Certainty of Mental States and Interest and Curiosity were non-significant and positive, except for the relationship between regulation and Certainty of Mental	1. r = -.38** - -.49** 2. r =.06 - .25; -.12.

	States. Persistence on a generic distress tolerance task was not significantly related to PRF. 3. Persistence time on the PASAT-C was non-significantly negatively related to Pre-mentalizing and Interest and Curiosity, and non-significantly positively related to Certainty of Mental States. Tolerance for infant distress was related to lower Pre-mentalizing: Persistence time on the BSIM was significantly negatively related to Pre-mentalizing (4) and non-significantly related to Certainty of Mental States and Interest and Curiosity (5).	3. r = -.14 - .14 4. r = -.31* 5. r = -.11 - 0.2.

**. Correlation is significant at the 0.01 level
*. Correlation is significant at the 0.05 level

Table 7: Parenting

Authors and date	Country	QA Score	Design	Sample Size	Psychological characteristic	Measure of PRF	Analysis	Relevant Findings	Test statistic
De Roo, Wong, Rempel & Fraser (2019).	Canada	85%	Cross-sectional	306 (186 mothers, 120 fathers)	Parental Coping (Parent coping scale), Perceived parenting competence (Parenting Sense of Competence Scale, PSOC)	PRFQ (18 items)	Correlation	Perceived parental competence and greater parental coping were related to higher PRF in mothers and fathers. 1. Total parental competence was significantly positively related to all subscales of the PRF. 2. For mothers and fathers, the satisfaction scale of the PSOC was significantly positively correlated with the PRFQ total and the Pre-mentalizing subscale of the PRFQ, and non-significantly related to Certainty of Mental States and Interest and Curiosity. 3. The Efficacy subscale of the PSOC was significantly positively related to all scales of the PRFQ, except pre-mentalising, which showed a significant negative relationship for mothers and a non-significant positive relationship for fathers. 4. The Parental Coping Scale was significantly negatively related to Pre-mentalizing for mothers and fathers. 5. For mothers, the Parental Coping Scale was significantly positively related to Certainty of Mental States, and showed non-significant correlations between PRFQ total and Interest and Curiosity. For fathers, the Parental Coping Scale was significantly positively related to	1. Mothers: r =.16* -.37**. Fathers: r = 17** -.52**. 2. Mothers: r =.29**, 0.5**, -.04, .06. Fathers: r =.39**, .65**, -.09, .04. 3. Mothers r =.15* -.32**, -.27**. Fathers: r =.32** -0.40**, .10. 4. Mothers: r = -.28 Fathers: r = -.21* 5. Mothers: r = .15*, -.04, .11. Fathers: r = .15* - .37**.

								PRFQ total, Certainty of mental states and Interest and Curiosity.	
Menashe-Grinberg, Shneor, Meiri & Atzaba-Poria (2022).	Israel	81%	Intervention study (3 time points)	70 mothers	Beliefs about Feelings (PBAF); Parental Efficacy (Combined scores from the parental responsibility, child's control and parents' control subscales of the PLOC and the PSOC)	RFS applied to PDI	Correlation	1. Non-significant positive correlations between PRF and parental beliefs about feelings, and 2. PRF and overall parental efficacy.	1. r =.16 2. r =.11.
Jessee, A. (2020).	USA	70%	Cross-sectional	52 mothers	Parenting Beliefs (Parent Modernity Scale, 23 item)	RFS applied to PDI	Correlation	1. Progressive parenting beliefs were significantly positively related to higher PRF. 2. This remained after controlling for maternal age and education.	1. r =.323*. 2. r(48)=.282*.

**. Correlation is significant at the 0.01 level
*. Correlation is significant at the 0.05 level

Table 8: Executive Function

Authors and date	Country	QA Score	Design	Sample Size	Psychological characteristic	Measure of PRF	Analysis	Relevant Findings	Test statistic
Rutherford, Byrne, Crowley, Bornstein, Bridgett & Mayes (2018).	USA	75%	Cross-sectional	50 (study 1), 68 (study 2) mothers	Working memory (Corsi block tapping, WAIS backward digit span; 'Two-back' task) Set-shifting (card sort)	PRFQ (18 items)	Correlation; Regression	Working memory and Set-shifting were associated with Interest and Curiosity only. Correlation: Study 1: 1. Composite working memory was significantly positively correlated with Interest and Curiosity. 2. Composite working memory was not significantly associated with Pre-mentalising or Certainty of Mental States. Study 2: 3. Working memory was significantly positively correlated with Interest and Curiosity. 4. There were no significant correlations between working memory and Pre-mentalising or Certainty of Mental States. 5. Set Shifting was significantly positively correlated with Interest and Curiosity. 6. Set shifting was not significantly related to Pre-mentalising or Certainty of Mental States. Regression Study 1: 7. Working memory was associated with Interest and Curiosity after controlling for maternal parity and age. Study 2: 8. Working memory remained significantly associated with Interest and curiosity when controlling for maternal parity. 9. Set shifting remained significantly associated with Interest and Curiosity after controlling for infant age.	1. r =.42** 2. r = -.02 - -.21. 3. r =.28* 4. r = -.02 - -.08. 5. r =.39** 6. r = -.08 - .11 7. β=0.41*. 8. β=1.32* 9. β=-0.02**

Yatziv, Kessler, & Atzaba-Poria (2020).	Israel	80%	Cross-sectional	96-93 mothers	Executive Function: Updating (2-back/n-back), Set Shifting (cued task-switching), Response Inhibition (antisaccade). Resistance to interference (intrusion cost, flanker effect).	RFS applied to PDI	Correlation, Regression	Correlations: 1. Neither overall executive function nor resistance to interference were significantly correlated with overall PRF. Regression: 2. Overall executive function did not significantly predict PRF when moderators were controlled for; however; executive function predicted PRF amongst 3. mothers of children born at term, 4. mothers who perceived their child to be of difficult temperament and 5. mothers who were dissatisfied with coparenting arrangements. 6. Resistance to interference did not significantly predict PRF, except when 7. the child was perceived to be of difficult temperament.	1. r =.09, .11 2. β=0.15, r2=.31 3. β=-0.22* 4. β=0.23* 5. β=.25* 6. β=-0.02, r2=.27 7. β =0.26*

**. Correlation is significant at the 0.01 level
*. Correlation is significant at the 0.05 level

1.4.4.1 Personality.

Personality was conceptualised as a group of stable characteristics with cognitive, affective and behavioural components. Two studies, of good and excellent quality, investigated relationships between personality traits and PRF. One cross-sectional study investigated the role of hostility, defined as a set of enduring negative beliefs about others' intentions and related to the concept of neuroticism (Sanz et al., 2010). An experimental study also investigated the role of connectedness, an aspect of self-determination (Sheldon & Hilpert, 2012). Both recruited large samples. A further study also investigated a broad range of personality traits, including agreeableness, neuroticism, empathy and hostility, but data could not be extracted as PRFQ scores were combined with a parenting stress measure.

Hostility was significantly negatively related to PRF, with a small effect size, in a single study (Arikan & Kumru, 2021). However, hostility was not found to predict PRF in a path analysis with PRF as a mediator between hostility and maternal behaviour in the same study.

A single study investigated the role of connectedness to others (Nelson-Coffey et al (2021). This found that connectedness predicted lower pre-mentalizing modes and greater Certainty of Mental states, both with a medium effect size. No significant relationship was found with interest and curiosity.

1.4.4.2 Emotion

A total of seven studies explored links between aspects of emotion and PRF. Overall, these ranged from adequate to excellent quality.

Alexithymia. Alexithymia refers to difficulties identifying and describing one's own emotional state (Sifneos, 1973). One large-scale cross-sectional study (Ahrnberg et al., 2020), rated excellent quality, investigated the relationship between Alexithymia and PRF using the TAS-20.

This study found that TAS-20 total scores and subscales (except for difficulty identifying feelings) were negatively correlated with overall PRF, with small to medium effect sizes. A regression analysis found that overall Alexithymia significantly predicted lower overall PRF, though this was driven by externally oriented thinking.

Furthermore, all aspects of Alexithymia on the TAS-20 were significantly related to lower interest and curiosity and less appropriate reasoning about the child's mental states, with small to medium effect sizes. Conversely, higher scores on all scales of the TAS-20 (except externally-oriented thinking) were significantly associated with greater scores on the PRF factor measuring the perceived opacity of mental states (small effect sizes), indicating greater difficulty hypothesising about the child's underlying feelings. Lastly, there were no significant relationships between Alexithymia and the ability to acknowledge uncertainty in interpretations of the child's mental states.

Emotion Regulation. Emotion regulation refers to an individual's ability to modulate their emotional experience (Gross, 2002) and adapt to environmental stressors (D'Agostino et al., 2017). Processes for regulating emotions include the ability to identify, accept and manage emotions and their intensity (Gratz & Roemer, 2004). Cognitive reappraisal is defined as the tendency to reframe a situation to reduce its emotional impact (Gross & John, 2003) and has been shown to lead to greater experience of positive emotion and diminished experiences of negative emotions (Goldin et al., 2008). Conversely, expressive suppression refers to the inclination to inhibit emotional expression, and is associated with reduced experience of positive as well as negative emotions (Goldin et al., 2008; Gross & John, 2003).

Four studies, rated good to excellent, investigated a link between emotion regulation and PRF. All used the DERS, and two also used the ERQ. Three of these studies employed cross-sectional designs, whilst one (Zimmer-Gembeck et al., 2019) was an intervention study, which unfortunately did not record baseline correlations between variables, but did explore correlations between degrees

of improvement on the DERS and the PRFQ. All four studies analysed the PRFQ subscales separately, and did not compute an overall PRFQ score.

A link between poorer emotion regulation and pre-mentalising modes was consistently observed, with two studies (Moreira & Fonesca, 2022; Schultheis et al., 2019) reporting significant positive correlations between all DERS subscales and Pre-mentalising modes (small to medium effect sizes), and Wang (2022) reporting that DERS scores significantly predicted greater pre-mentalising using structural equation modelling. Suppression of emotion was also related to higher pre-mentalizing in a single study, with a small effect size (Schultheis et al., 2019). Conversely, emotional reappraisal was related to lower pre-mentalizing in the same study (small effect size). Additionally, Zimmer-Gembeck et al (2019) found that reduced suppression, but not improvements on the DERS, were related to improvements in pre-mentalising modes (small effect size).

The relationship between emotion regulation and certainty of mental states is less consistent. One study (Moreira & Fonseca, 2022) observed significant negative correlations between all DERS scales and certainty of mental states, with small effect sizes. Conversely, Schultheis et al. (2019) found that only greater difficulty engaging in goal-directed behaviour was significantly associated with lower certainty of mental states (with small effect size), and that the goal-directed behaviour subscale significantly predicted certainty of mental states in a regression model controlling for maternal age. Additionally, Wang (2022) found no significant relationship between the DERS and certainty of mental states, but only analysed the DERS total score. Notably, Moreira and Fonesca's study had the highest quality score at 95%, and a much greater sample size (N = 710) than the other two studies. Given the small effect size, the observed relationships could therefore be spurious. Nonetheless, in Moreira and Fonesca's results, the awareness scale of the DERS had the largest effect size, with the goal-directed behaviour subscale intermediate amongst all DERS subscales. Therefore, the role of statistical power in creating these conflicting results is not certain. Neither reappraisal nor suppression were related to certainty of mental states (Schultheis et al., 2019).

Improvements in emotion regulation were also not significantly related to improvements in certainty of mental states (Zimmer-Gembeck et al.,2019)

Three studies reported an association between emotion regulation difficulties and lower interest and curiosity. Wang (2022) found that greater overall DERS scores predicted lower interest and curiosity using structural equation modelling. Two studies (Moreira & Fonesca, 2022; Schultheis et al., 2019) reported significant negative relationships between lack of awareness of emotion and interest and curiosity, with small to medium effect sizes. Schultheis' study also found that lack of awareness predicted lower interest and curiosity in a regression model, when controlling for maternal education, and this produced the largest coefficient in the model. Additionally, Moreira and Fonesca also reported significant negative correlations between non-acceptance of emotion, impulsivity and interest and curiosity, with small effect sizes. In contrast to other aspects of PRF, Zimmer-Gembeck et al (2019) reported that improvements on the DERS and increased reappraisal on the ERQ significantly predicted improved interest and curiosity, with small effect sizes.

Distress Tolerance. Whilst similar to emotion regulation, distress tolerance encompasses an individual's interpretation of the acceptability of experiencing distress, adaptive or maladaptive strategies for managing distress, and the extent to which the individual is consumed by distress (Lejuez et al., 2013). In the context of parenting, tolerance for distress arguably allows the parent to maintain a regulated state in order to persist in soothing the infant (Rutherford et al., 2013). Associations between distress tolerance and PRF were investigated by two cross-sectional studies, using three methods.

In one study, rated good quality (Rutherford et al., 2015), better tolerance, absorption and appraisal of distress were related to lower pre-mentalizing modes, all with medium effect sizes. No significant correlations were observed between the four DTS subscales and certainty of mental states, nor interest and curiosity.

Both studies (Rutherford et al., 2013; Rutherford et al., 2015) each used two behavioural tasks to measure distress tolerance: instruction to soothe a simulated infant, programmed to be inconsolable (BSIM), and a computerised task designed to elicit frustration (PASAT-C). These studies were rated from adequate (Rutherford et al., 2015) to excellent (Rutherford et al., 2013). In one of these studies, longer persistence times of the BSIM were significantly correlated with lower pre-mentalizing modes, with a medium effect size (Rutherford et al., 2015). However, this relationship was non-significant in Rutherford et al.'s (2013) study. Despite its higher quality assessment score, this study had a much lower sample size than Rutherford et al. (2015), such that non-parametric tests were used. Both studies observed non-significant negative relationships with certainty of mental states. Conversely, Rutherford et al (2013) observed that longer persistence times on the BSIM were associated with greater interest and curiosity, though this relationship was non-significant in Rutherford et al.'s (2015) study. Both studies found no significant relationships between persistence on the PASAT-C any PRF subscale.

1.4.4.3 Parenting

Three studies investigated the role of psychological characteristics related to parenting on PRF, ranging from good to excellent quality.

Parenting efficacy refers to parents' own sense of competence in their parenting. There was mixed evidence that parenting efficacy is related to better PRF. One of the two studies assessing parenting efficacy (De Roo et al., 2019) found evidence that greater perceived competence was related to higher scores and all subscales of the PRFQ, including pre-mentalizing modes (medium to large effect sizes). Significant positive correlations were also observed between parenting satisfaction and both overall PRF and pre-mentalizing modes, with small to large effect sizes. Greater efficacy was related to greater certainty of mental states and interest and curiosity for both mothers (small to medium effect sizes) and fathers (medium to large effect sizes) and lower pre-mentalizing modes for

mothers only (small effect size). Conversely, the other study of parenting efficacy (Menashe-Grinberg et al., 2022) observed no significant correlations between parenting efficacy and PRF, measured by the PDI. However, this study used a composite measure of parenting efficacy, based on combined scores on the PSOC and a selection of subscales from the parental locus of control questionnaire. Therefore, the findings are not directly comparable. Menashe-Grinberg et al.'s study also had a much smaller sample.

One study (De Roo et al., 2019) observed that greater perceived coping was significantly related to greater overall PRF for fathers, but not for mothers (small effect sizes). Greater perceived coping was significantly associated with lower pre-mentalizing modes for both mothers and fathers, with small effect sizes. Positive correlations were also observed between coping and certainty of mental states for both mothers and fathers (small effect sizes), and interest and curiosity for fathers only (medium effect size).

One study (Jessee, 2020) observed that more progressive parenting attitudes were significantly related to higher PRF (medium effect size). The relationship remained significant when controlling for maternal age and education (small effect size). However, parents' beliefs about managing their child's feelings were not significantly related to PRF in a single study (Menashe-Grinberg et al., 2022). Notably, this study did not observe any significant effects across all variables studied.

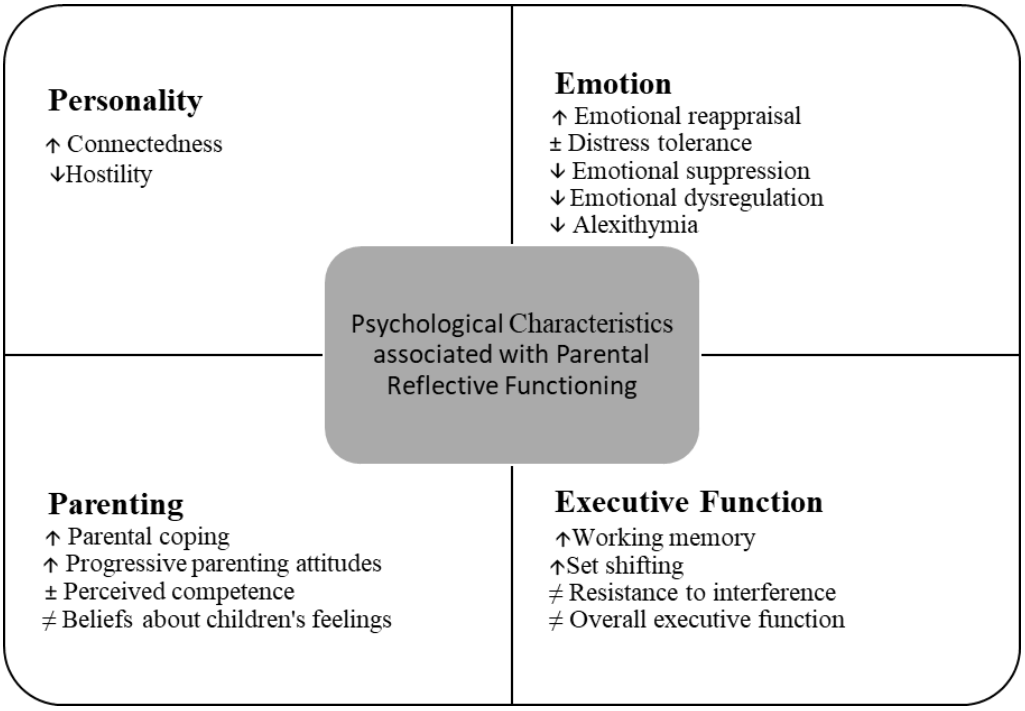
1.4.4.4 Executive Function

Executive function comprises a group of internal processes which allow the co-ordination and control of emotion and behaviour, facilitating the attainment of goals (Alvarez & Emory, 2006). Two studies, rated good (Rutherford et al., 2018) and excellent (Yatziv et al., 2020), examined associations between executive function processes and PRF.

In one study, better working memory was significantly associated with higher interest and curiosity only (medium effect size), with small, non-significant negative relationships with pre-mentalizing

modes and certainty of mental states (Rutherford et al., 2018). Set-shifting, which measures the ability to adapt to changing task demands, was also positively associated with interest and curiosity only (medium effect size), and showed a non-significant negative relationship with pre-mentalizing modes, and a non-significant positive relationship with certainty of mental states, both with small effect sizes (Rutherford et al., 2018). Furthermore, Yatziv et al (2020) created composite working memory scores by combining similar working memory and set shifting tasks to those used by Rutherford et al. (2018), alongside a response inhibition task. These composite scores were not significantly correlated with overall PRF. However, in a regression analysis, the authors showed that composite executive function predicted PRF amongst mothers of children born at full term, mothers who were dissatisfied with co-parenting arrangements, and mothers who perceived their child to be of difficult temperament. Resistance to interference was investigated by one study (Yatziv et al., 2020), and was not found to correlate significantly with PRF, or to significantly predict PRF, except when the child was perceived to be of difficult temperament.

Figure 2: Summary of Research Findings by Domain



Key

↑ Associated with increased PRF

↓Associated with reduced PRF

± Mixed evidence

≠ Very limited evidence, or evidence of no effect

1.5 Discussion

1.5.1 Overview of Findings

The review identified four groups of characteristics associated with increased or reduced PRF: Personality; Emotion; Parenting and Executive Function. Emotion was the most widely studied area, with a largely consistent pattern of results across studies, and all but one study rated good or excellent. Mixed evidence was observed in the parenting domain. In the other domains, most findings are from one study only, so represent tentative evidence. Overall, poorer emotion

recognition and regulation were related to lower PRF, whilst better perceived ability and coping as a parent may be related to better PRF. More research on personality and executive functioning is required before firm conclusions can be drawn.

Personality factors were an understudied area, with only two studies included in the review. Hostility was related to lower PRF (Arikan & Kumru, 2021), which is arguably consistent with the malevolent attributions of the child's motives captured in the pre-mentalizing component of PRF (Luyten et al., 2017), although this subscale was not examined separately. Conversely, connectedness was associated with lower pre-mentalizing modes and greater certainty of mental states (Nelson-Coffey et al., 2021). Connectedness has been associated with a secure attachment style (Lin, 2016), and therefore may represent more positive views of others, and therefore a lower likelihood of ascribing malevolent intent to the child. However, Luyten et al. (2017^{B}) note that excessive certainty of mental states can represent inappropriate mentalizing, and so it is possible that individuals who feel more connected to others may be overconfident in inferring others' mental states. Nonetheless, replication is required to establish the reliability of the findings and guide interpretation. One further study (An et al., 2022) also investigated a broader range of personality traits but data could not be extracted as PRFQ scores were combined with a parenting stress measure. Further investigation of these factors would add to the literature on associations between personality traits and PRF.

Emotional factors were more widely studied, and the findings in this area were the most consistent, though many studies reported small effect sizes. A link between emotion regulation difficulties and greater pre-mentalizing modes was frequently observed. This could be explained by parents with emotion regulation difficulties becoming more easily overwhelmed by the child's needs or behaviour, and therefore finding it more difficult to imagine the child's perspective. Conversely, greater distress tolerance was related to lower pre-mentalizing modes (Rutherford et al., 2013; Rutherford et al., 2015), perhaps because such parents are less easily overwhelmed. This is

consistent with the assertion that mentalizing would be more difficult when emotionally heightened (Fonagy et al., 2002). Notably, almost all aspects of emotional dysregulation were related to lower PRF. Emotional dysregulation is a multidimensional construct (Gratz & Roemer, 2004), which could impact on PRF in different ways, depending on the nature of the difficulty. For instance, acting impulsively due to intense emotion may affect PRF differently compared to lack of awareness of emotions.

Reduced emotional awareness of one's own feelings, and difficulty identifying feelings, were related to lower interest and curiosity towards the child's mental states. There was mixed evidence that these factors were also related to lower certainty of mental states. It is likely to be more difficult for parents who struggle to identify their own feelings to notice and theorise about their child's internal world. Furthermore, one study observed that greater non-acceptance of emotion was related to lower interest and curiosity, which may suggest that parent's unwillingness to reflect on negative emotions may occur alongside difficulty acknowledging negative emotions in the child (Moreira & Fonesca, 2022). The same study also found that difficulty controlling impulses were also related to lower interest and curiosity. The authors suggest that impulsivity during emotional arousal may lead to the parent becoming preoccupied with their own feelings and therefore less able to mentalize (Moreira & Fonesca, 2022). However, as these relationships were only observed in one study, replication is required.

There was also mixed evidence regarding whether improvements in emotion regulation are associated with improvements in PRF. When using the DERS, improvements in emotion regulation after a parenting intervention were associated with improvements in interest and curiosity only (Zimmer-Gembeck et al., 2019). However, the same study observed that reduced emotional suppression following the intervention were related to lower pre-mentalizing modes. Replication is needed to ascertain whether particular aspects of emotion regulation are differentially implicated in

improving each component of PRF. Analysing the DERS subscales separately may also identify particular processes by which improved emotion regulation may lead to improved PRF.

There is mixed evidence that greater perceived parenting efficacy is associated with better PRF, with one of two studies reporting significant effects (De Roo et al., 2019; Menashe-Grinberg et al., 2022). However, the study reporting null findings used a smaller sample size and combined several measures into one score, so these results may be less credible. Greater self-reported parental coping was associated with more optimal PRF in a single study (De Roo et al., 2019). Poorer perceived efficacy or coping may lead to stress or emotional overwhelm, theorised to undermine PRF capabilities (Fonagy et al., 2002). However, the direction of the relationship is unclear, as mentalizing difficulties could also reduce perceived parenting efficacy or coping. Future research could consider whether stress or emotional arousal influences an association between parenting efficacy and PRF.

One study showed that more progressive parenting attitudes were related to greater PRF (Jessee, 2020). Authoritarian parenting is focussed on the child's compliance, whereas progressive parenting takes the child's perspective into greater consideration (Schaefer, 1991). Therefore, progressive parenting, but not authoritarian parenting, arguably requires good PRF abilities to be used successfully. Interestingly, no relationship was observed between parents' attitudes to managing their child's feelings and PRF, even though an association would be theoretically expected, as parents are likely to endorse beliefs which reflect their attitudes to parenting (Jessee, 2020).

There was very limited evidence for an association between executive function and PRF. One study (Rutherford et al., 2018) observed relationships between both working memory and set shifting, and interest and curiosity. Attentional processes may be implicated in the ability to notice the child's mental state amidst competing demands (Håkansson et al., 2018). Nonetheless, the evidence is tentative, based on mostly small effect sizes observed within a small sample. Yatziv et al. (2020)

combined several executive functioning processes into one score, which may have masked possible effects. This study also observed small significant effects only in very particular circumstances: amongst children born at term, whose mothers were dissatisfied with co-parenting arrangements and perceived their child to be of difficult temperament, suggesting limited generalisability. Moreover, neither of the studies investigating PRF involved fathers. Therefore, the evidence for a role of executive functioning in PRF is inconclusive.

1.5.2 Strengths and Limitations

This is the first systematic review to collate evidence regarding psychological factors associated with PRF. The scope of the search was broad, allowing a range of psychological characteristics to be identified and included. The search strategy was comprehensive and subject terms were used to ensure all relevant articles were captured. However, only a relatively small subset of search results were screened by a second reviewer, although inter-rater reliability was good.

Whilst the review identified a broad range of characteristics associated with PRF, most findings are from single studies, which limits the conclusions which can be drawn. Although the majority of studies were deemed of good quality, many employed cross-sectional correlational designs, and therefore it is not possible to infer the direction of the associations reported. Whilst the studies were conducted over a wide geographical area, the majority of participants were white in most studies, limiting the generalisability of the findings. Many studies also employed small samples, and in some cases, were recruited from less inclusive settings (such as closed online survey platforms), reducing the likelihood that the sample is representative of the wider population.

In view of the broad range of study designs which may have been eligible for inclusion, a generic quality assessment tool was selected. However, the QualSyst Tool employed a narrow scoring range of 0-2, which reduced the possible range of scores and sometimes resulted in studies both receiving

an intermediate rating despite one employing more rigorous methodology than the other. The scoring method also assumes an equal weighting of each quality assessment item, whereas some methodological practices may impact validity more strongly than others. The broad criteria of the tool may also have given rise to relatively lenient quality assessment ratings.

1.5.3 Implications and Future Directions

This review has collated existing evidence and identified several areas for further enquiry. Replication is required in almost all areas to increase confidence in the conclusions that have been drawn from single studies, and to address conflicting findings. Although in most instances there are theoretical reasons to expect a particular causal direction, longitudinal or repeated measures designs should also be utilised to provide evidence of causal mechanisms.

Personality was an understudied area, yet given the effects of attachment style on personality development (Hazan & Shaver, 1987), it is pertinent to give further consideration to associations between different personality traits and PRF. Whilst the effects of emotion regulation were more widely studied, the relationship between emotional dysregulation and PRF could also be examined in more detail to identify specific mechanisms for these effects. Further research is needed on the associations between parenting efficacy and attitudes and PRF, and it may be particularly important to examine directions of causality, and associations with stress and emotional arousal, in this group of variables.

The findings from this review also have implications for developing parenting interventions to support more effective PRF. The suggestion that improvements in emotion regulation were associated with improvements in PRF after a parenting programme (Zimmer-Gembeck et al., 2019) demonstrates the need for such interventions to also include components to support reflection. This is important given that many parenting interventions focus solely on improved PRF as an outcome,

yet Suchman (2010) highlights the need to support the adult's self-reflection before reflection on the child. Further research should clarify which aspects of emotion regulation or dysregulation are related to each component of PRF, and investigate how emotion regulation can be targeted most effectively to promote improved PRF. Intervention studies could also examine the direction of the observed association between parenting efficacy or coping and PRF, and investigate whether any improvements in parenting efficacy and PRF are influenced by improved emotion regulation.

Notably, many if not all, of the characteristics identified are theoretically related to attachment, and therefore investigating whether these factors have mediating roles in the relationship between adult attachment style and PRF could partly address the loose coupling hypothesis. Establishing the roles of such mediating factors could identify further areas of intervention to support improved PRF, thereby promoting the development of healthy attachment in the child. Lastly, this review only focussed on an assumed typically developing, healthy population. The relationships between the characteristics identified in this review and PRF may differ in populations where the parent or child is experiencing illness or disability, or additional factors may be relevant to the populations. Future research should therefore investigate characteristics related to PRF in a broader sample.

1.6 Conclusion

This review identified and appraised existing research on psychological characteristics associated with PRF. Four main areas of existing research were identified, with the most consistent evidence for emotional factors, and emerging evidence for parenting factors. Overall, poorer emotion recognition and regulation were associated with lower PRF, whilst better perceived ability and coping as a parent may be related to better PRF. Further research is required to draw conclusions regarding the role of personality factors and executive functioning, and to infer the direction of observed associations. The results suggest there is a potential role for emotion regulation as a

component of interventions aiming to improve PRF, and this possibility should be investigated further.

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Chapter 2 Investigating the Influence of Attachment Style, Emotion Regulation and Parental Reflective Functioning on Parenting Stress in Foster Carers

The following paper has been prepared in line with the author guidelines for the journal Attachment and Human Development.

2.1 Abstract

Caregiver stress amongst foster carers increases the likelihood of placement breakdown, resulting in poorer outcomes for looked after children. Parental Reflective Functioning (PRF) is associated with lower caregiver stress. There is evidence that adult attachment style and emotion regulation abilities influence an individual's level of PRF, but the relationships between these constructs and PRF have not been investigated simultaneously. The aim of this study was to investigate cross-sectional associations between attachment dimensions, emotional dysregulation and PRF, and how these relate to caregiver stress amongst foster carers. Seventy-three foster carers completed measures of attachment (Experiences in Close Relationships-Revised), emotional dysregulation (Difficulties with Emotion Regulation Scale – Short form), PRF (Parental Reflective Functioning Questionnaire) and caregiver stress (Parental Stress Scale). Significant associations were observed between the key variables, with the attachment dimensions differing in the strength and pattern of these relationships. The results suggest that PRF statistically predicts caregiver stress, and that attachment dimensions, emotional dysregulation and PRF may contribute to this association through overlapping variance. The findings are broadly consistent with research involving birth parents, and identify several areas of future research. The results add to the growing recognition of the importance of PRF for supporting foster carers in their role.

Keywords: Parental Reflective Functioning, Mentalization, Emotion regulation, Caregiver Stress, Foster Carers

2.2 Introduction

2.2.1 Caregiver Stress and Foster Carer Retention

Foster carers have an integral role in the care system, with 71% of Looked After Children placed in foster care (House of Commons, 2022). Caring for children who have experienced early abuse and neglect presents greater challenges than parenting children without such experiences (Tarren-Sweeney, 2008). As such, foster carers have reported higher levels of caregiver stress than birth parents (Bergsund et al., 2020). Severe or prolonged caregiver stress has been associated with both harsh, overreactive and submissive parental behaviour (Guajardo et al., 2009; Vanschoonlandt et al., 2013) and placement breakdown (Adams et al., 2018), leading to retraumatisation of the child. Caregiver stress is also related to attrition of foster carers (Adams et al., 2018), with 21% of foster carers reporting insufficient training and support as their main reason for leaving the profession (Competition & Markets Authority, 2022). With a continued trend towards decreasing fostering capacity and a projected shortfall of available foster carers (Ofsted 2022), there is a pressing need to prevent and ameliorate caregiver stress to improve the retention of foster carers and ensure good outcomes for children in care.

2.2.2 Parental Reflective Functioning as a Buffer Against Caregiver Stress

Increasing attention is being given to the concept of Parental Reflective Functioning (PRF) as a skill to equip foster carers in their role. This refers to the ability to reason about their own and their child's mental states, and how these influence their interactions and relationship (Luyten et al., 2017[A]). Three elements indicate the quality of PRF. Pre-mentalizing describes a difficulty considering the child's perspective and the tendency to infer malevolent attributions of the child's behaviour. Certainty of mental states refers to the adult's confidence in making inference about the

child's internal world, which can range from excessive uncertainty to overconfident or 'intrusive' mentalizing (Luyten et al., 2017[B]). The third component of PRF is the adult's ability to show interest and curiosity towards the child's internal world. Therefore, low pre-mentalizing, an intermediate level of certainty, and greater interest and curiosity, are considered indicative of optimal PRF (Luyten et al., 2017[B]).

It is proposed that greater capacity for PRF leads to a more accurate understanding of the emotions underlying the child's behaviour, therefore allowing the carer to respond more appropriately (Fonagy & Target, 1997), perhaps leading to increased empathy for the child and a greater sense of competence (Staines et al., 2019). For foster carers, greater understanding of the child's difficulties and confidence in responding appropriately could be expected to protect against caregiver stress. Amongst birth parents, greater use of pre-mentalizing has been associated with elevated caregiver stress (Nijessens et al., 2018), whereas more adaptive PRF was associated with greater perceived competence and coping (De Roo et al., 2019).

Therefore, if the same association between PRF and caregiver stress existed for foster carers, then promoting foster carers' reflective functioning may also reduce the negative consequences of caregiver stress in this population. This could be achieved through training and intervention programmes. However, evaluations of foster carer training programmes aimed at supporting PRF are limited, and have yielded mixed results. Adkins et al. (2021) reported an improvement in pre-mentalizing compared to a control intervention, though it was not clear whether this improvement was sustained at follow-up. Conversely, Staines et al. (2019) reported improvements in interest and curiosity only. Furthermore, two studies observed no significant change in PRF following training (Redfern et al., 2018; Midgely et al., 2019). Interpreting these findings is complicated by the use of different intervention programmes and small, uncontrolled samples. Nonetheless, there is a need for further investigation into mechanisms by which healthy PRF can be promoted amongst foster carers.

One avenue of research is to consider additional factors influencing an individual's quality of PRF, to understand potential barriers to improving reflection.

2.2.3 Influences on the Development and Application of PRF

It is suggested that PRF develops in the context of the individual's attachment representations, as the individual's early attachment to their caregiver informs their reasoning about the feelings and intentions of others (Fonagy & Target, 1997; Sharp & Fonagy, 2008). This is supported by observations of higher PRF amongst securely attached than insecurely attached individuals (Sharp & Fonagy, 2008). The relationship between insecure attachment and parenting stress has also been shown to be mediated by PRF (specifically, pre-mentalizing) in a longitudinal study of birth parents (Nijessens et al., 2018), suggesting that it is important to consider the influence of attachment on PRF. Moreover, each attachment dimension represents a different pattern of relating to others, with avoidant attachment associated with self-reliance and anxious attachment characterised by preoccupation with or overinvolvement in relationships (Bartholomew & Horrowitz, 1991). Therefore, it is plausible that the balance of the three dimensions of PRF might differ between the insecure attachment styles, as well as between securely and insecurely attached individuals. For instance, Luyten et al. (2017[B]) posit that attachment anxiety is more likely to be associated with intrusive mentalizing, whilst attachment avoidance is likely to be associated with lower interest and curiosity. There is currently some empirical evidence for the latter pattern (Moreira & Fonesca, 2022; Pazzagli et al. (2018). The existence of such different patterns would imply that different approaches may be required to support healthier PRF, depending on the individual's attachment pattern.

Nonetheless, a 'loose coupling' between PRF and attachment security has been observed: although poorer PRF is observed amongst insecurely attached individuals, substantial variation in PRF remains amongst securely attached individuals (Sharp & Fonagy, 2008; Luyten et al., 2017[A]). This

suggests that the relationship between attachment style and quality of PRF is not deterministic, and that additional factors influence the development of PRF, or ability to access such capabilities.

Attachment representations are also implicated in the development of emotion regulation; the ability to modulate emotional experience (Gross, 2002) and adapt to environmental stressors (D'Agostino et al., 2017). According to attachment theory, individuals learn to regulate emotion through the relationship with their caregiver (Mikulincer & Shaver, 2016). Therefore, the strategies acquired were initially effective, but can be more or less adaptive in later life, depending on the nature of the individual's attachment style (Mikulincer & Shaver, 2019). For instance, attachment anxiety is associated with a tendency to employ 'hyperactivating' strategies to regulate emotion, which intensify the emotional experience and lead to a sense of overwhelm, in order to alert potential sources of support, whilst avoidant attachment is associated with 'deactivating' strategies, including inhibited emotional expression or recognition of one's own distress (Mikulincer & Shaver, 2007). Fonagy et al. (1991) argue that openness to emotional experience is a requirement for reflective capacities. Therefore, difficulties with emotion regulation could compromise the ability to demonstrate PRF, particularly during high emotional arousal (Fonagy et al., 2002).

Evidence of such a relationship between emotion regulation abilities and PRF is emerging. Difficulty regulating emotions is related to increased pre-mentalizing (Schultheis et al., 2019; Moreira & Fonesca, 2022; Wang et al., 2022), lower interest and curiosity (Wang et al., 2022) and lower certainty of mental states (Moreira & Fonesca, 2022). Specific emotion regulation difficulties, including lower awareness of one's own emotions (Schultheis et al., 2019), impulsivity and non-acceptance of emotions (Moreira & Fonesca, 2022), have also been associated with lower interest and curiosity, whilst a relationship between difficulty engaging in goal-directed behaviour and lower certainty of mental states has also been observed (Schultheis et al., 2019). These specific emotion regulation difficulties, such as maintaining goal-directed behaviour and lack of awareness of emotion arguably correspond to hyperactivating and deactivating strategies, respectively (Stevens, 2014), yet

the relationships between attachment dimensions, emotion regulation and PRF have not been empirically tested in the same model.

Therefore, there is a need to understand the influence of attachment on an individual's use of the components of PRF, in order to understand how attachment and PRF may relate to caregiver stress amongst foster carers. Furthermore, the relationships between attachment, emotion regulation and PRF warrant further investigation. Understanding these relationships may lead to improved understanding of how to promote optimal PRF and reduce caregiver stress amongst foster carers.

2.2.4 Aims of the Current Study

The present study therefore had two aims. Firstly, to investigate cross-sectional associations between attachment dimensions and PRF, and how these factors and emotional dysregulation relate to caregiver stress amongst foster carers. The study also aimed to explore the role of emotional dysregulation in the relationship between attachment dimensions and PRF. Although a cross-sectional design was used to explore the relationships between these constructs, inferring the order of variables was theoretically justified, as attachment representations develop early in life and are theorised to influence the development of emotion regulation strategies and PRF.

The following hypotheses were tested:

1. Attachment dimensions, emotion regulation and the three components of PRF will be related to parenting stress
2. Attachment dimensions will show a different pattern of relationships with the three components of PRF:
    a. Both anxiety and avoidance will be related to higher pre-mentalizing modes
    b. Attachment avoidance will be related to lower interest and curiosity and lower certainty of mental states on the PRFQ

c. Attachment anxiety will be related to higher certainty of mental states on the PRFQ

3. Each attachment dimension and the three components of PRF will be associated with caregiver stress, with a different pattern observed for each attachment dimension
4. Emotion regulation will moderate the relationships between each attachment dimension and the components of PRF

2.3 Materials and Methods

2.3.1 Design

The study employed a cross-sectional correlational design using survey data collected at one time point. The cross-sectional design was used to explore the relationships between these constructs, whilst the order of variables was based on prior research and theoretical considerations. Due to this theoretical ordering of variables a moderated mediation design was initially considered, with emotion regulation as the moderator and the three components of PRF as potential mediators. However, as the required sample size could not be reached, the model was investigated using regression methods.

2.3.2 Participants

2.3.2.1 Sampling Strategy.

Participants were a convenience sample of foster carers living in the UK. Participants were recruited through two routes: routine communication channels (e.g. email newsletters) within health and social care services for Looked After Children and independent fostering agencies; and on websites and social media pages managed by organisations and support groups dedicated to foster carers.

Inclusion Criteria: Participants were eligible if they were over the age of 21 (as this is the minimum age for fostering), had been a registered foster carer for over 6 months, and were currently caring for at least one foster child. A sufficient understanding of English was also required, as translated versions of the study materials could not be provided.

Exclusion Criteria: Participants were excluded if they did not currently have a foster child in their care, or had been a registered foster carer for less than 6 months.

2.3.2.2 Anticipated Sample Size

An a priori sample size calculation was undertaken using GPower 3.1 (Faul et al., 2007), based on a regression model (linear multiple regression, fixed model, R-squared deviation from zero), with 6 predictors. Power was set at 0.80 and the alpha error probability level at 0.05. On the basis of previous research on the relationship between attachment style, parental reflective function and parenting stress (Nijessens et al., 2018), medium effect sizes were anticipated. This resulted in an estimated required sample size of 98.

2.3.3 Measures

2.3.3.1 Demographic Information

A demographic questionnaire (see Appendix G) was used to gather participant characteristics, including information on demographics, fostering status and experience.

2.3.3.2 Attachment

The Experiences in Close Relationships – Revised (ECR-R; Fraley et al., 2000) assesses attachment security on two scales, anxiety and avoidance. This consists of 36 items scored on a 7-point likert scale (from 'strongly disagree' to 'strongly agree'). Lower scores indicate greater attachment security. The ECR-R has been validated and shows good internal consistency (.93

- .95) and temporal stability (Sibley & Liu, 2004). In the current study, internal consistency was .95 for anxiety and .95 for avoidance.

2.3.3.3 Emotion Regulation

The Difficulties in Emotion Regulation – Short Form (DERS-SF; Kaufman et al., 2016), is a validated revision of the original 36-item measure (Gratz & Roemer, 2004). The short form was used to reduce the potential for fatigue amongst participants. This measure has undergone confirmatory factor analysis, and correlations of the short form to the original measure are also high (.90 - .98; Kaufman et al., 2006). The DERS-SF assesses emotion regulation abilities, including awareness and acceptance of emotional responses, and adaptive and maladaptive regulation strategies. Responses are scored on a 5-point likert scale from 'never' to 'always.' Higher scores indicate greater emotional dysregulation. The global score was used as an indicator of trait emotion regulation abilities. In the current study, internal consistency was .91.

2.3.3.4 Parental Reflective Functioning

The Parental Reflective Functioning Questionnaire (PRFQ; Luyten et al.,2017B) is a validated measure of reflective functioning specific to the parenting role. The 18 items were developed based on the relevant literature and expert consultation and consist of three subscales: 'Pre-mentalising modes' (inability to consider the child's internal world), 'interest and curiosity in mental states' and 'certainty of mental states' (ability to recognise complexity in emotion and its expression). Low scores on pre-mentalizing and high scores on certainty of mental states and interest and curiosity are considered indicative of better PRF. Although there is some suggestion that high certainty of mental states may be maladaptive in some circumstances, this was not found in the validation of the PRFQ (Luyten et al., 2017^{B}). The measure shows good internal consistency (.70-.82; Luyten et al., 2017^{B}) and convergent validity (Luyten et al., 2017^{B}; Pazzagli et al., 2018). In the current study, internal consistency was .78 for pre-mentalizing modes, .75

for certainty of mental states and .40 (.65 after removing a problematic item) for interest and curiosity.

2.3.3.5 Parenting Stress

The Parental Stress Scale (Berry & Jones, 1995) is a standardised 18-item measure capturing the parent's current feelings towards satisfying and demanding aspects of the parenting role. Items are scored on a 5-point likert scale from 'strongly disagree' to 'strongly agree, ' and the measure yields a single overall score, with higher scores representing greater stress. The PSS has been validated specifically within the foster carer population, with good reliability (.82; Harding et al., 2020). In the current study, internal consistency was .89.

2.3.4 Ethical Considerations

The study was granted ethical approval from the Faculty Research Ethics Committee (FREC) at the University of Southampton (ERGO Number: 71456), the Health Research Authority Research Ethics Committee (IRAS number 311104; see Appendix D). Data protection and GDPR principles were adhered to throughout. Risks of participation were deemed to be low, as all questionnaires are routinely used in research and clinical settings and of a similar nature to the fostering assessment process. Participants were signposted to a variety of sources of support, including a foster carers' helpline and mental health organisations, should the study have caused distress.

2.3.5 Procedure

After receiving ethical approval, the study was advertised using the routes described above. The study took place through an online survey platform. After reading the participant information sheet and indicating consent, participants were directed to complete the questionnaire measures.

On completion, the debrief information was presented, and participants were given the opportunity to enter a prize draw to win one of several vouchers worth up to £25.

2.3.6 Data Analysis

The Statistical Package for the Social Sciences (SPSS) version 27 was used for all analyses. The data were screened for the plausibility of responses and potential outliers, and the percentage of missing data was calculated. Descriptive statistics, psychometric properties and variable distributions were examined. Cronbach's alpha values were excellent for all measures except for the interest and curiosity scale of the PRFQ. This was due to one problematic item (question 18), which had been found to lower reliability in previous research (De Roo et al., 2019). The item was therefore removed. Both the attachment dimensions, emotional dysregulation, pre-mentalizing modes and interest and curiosity scores significantly differed from a normal distribution, and therefore 95 percentile bootstrapping (1000 replications with bias-corrected confidence intervals and simple sampling) was applied to adjust for non-normality. Scatterplots and residuals plots were also observed, and no concerns regarding non-linear relationships, multicollinearity or heteroscedasticity were identified.

Bivariate correlations were conducted to examine relationships between demographic and standardised measures, and to test hypotheses 1 and 2. To assess hypothesis 3, two hierarchical linear regressions were conducted to investigate how well each attachment dimension, emotion dysregulation and PRF predict parenting stress concurrently, whilst controlling for covariates. Variables were entered in their theoretically-proposed temporal order, with covariates first. Covariates were entered on the basis of a significant correlation with the dependent variable. These analyses were conducted separately for attachment anxiety and avoidance, to explore different mechanisms for each attachment dimension. To assess the proposed moderating role of emotion regulation on the relationship between attachment dimensions and PRF (hypothesis 4),

hierarchical regression analyses were conducted with an interaction term between attachment dimension and emotional dysregulation added as the proposed moderator.

2.4 Results

2.4.1 Participant Characteristics

Of the 118 participants initially entering the study, 34 dropped out before completing any of the psychometric measures, and a further 11 did not complete all measures, leaving a final sample of 73 with no missing data. Dropout was scattered without any systematic pattern. Independent samples t-tests and chi-square tests confirmed that completers and non-completers did not significantly differ on any of the demographic variables. Therefore, data were analysed from completers only. Demographic characteristics for completers only are displayed in Table 1. The majority of participants were female (N = 62, 84.93%) and white British (N = 68, 93.15%). Age and education level were normally distributed. Overall, the sample showed skewness towards low scores on attachment anxiety, attachment avoidance, emotional dysregulation and pre-mentalizing.

Table 1: Participant Characteristics

Categorical variables	N	(%)	Continuous variables	M	SD	Range
Gender			Age	48.74	10.58	26 - 71
Female	62	(84.93)	Years of experience	8.70	9.03	0 - 50
Male	11	(15.07)	No. children fostered	21.86	46.62	1 - 300
Non-binary	0	(0.00)	Attachment Anxiety	2.26	1.20	1.00 – 5.28
			Attachment Avoidance	2.41	1.15	1.00 – 6.28
Education			Emotional Dysregulation	1.80	0.60	1.06 – 3.89
Secondary school	11	(15.07)	Pre-mentalizing	1.80	0.90	1.00 – 5.83
College	28	(38.36)	Certainty of Mental States	4.25	1.03	1.83 – 6.67
Undergraduate	23	(31.51)	Interest and Curiosity	5.41	0.53	3.83 – 6.33
Postgraduate	11	(15.07)	Caregiver Stress	41.60	11.40	21.00 – 80.00
Ethnicity[A]						
White British	68	(93.15)				

White Irish	1	(1.37)
Other white background	1	(1.37)
White and Black African	1	(1.37)
Other Mixed/Multiple	1	(1.37)
Ethnic Group Indian	1	(1.37)

[A]Only ethnic categories where N > 0 are reported.

2.4.2 Correlations between demographic characteristics and variables of interest

Zero-order correlations between all variables are shown in Table 2. The demographics characteristics of interest were selected based on similar previous studies (Arhnberg et al., 2020; Schultheis et al., 2019) and theoretical relevance. Amongst the demographics variables, education was significantly correlated with caregiver stress ($r = .27$, $p = 0.020$), and years of fostering experience was significantly correlated with emotional dysregulation ($r = -.28$, $p = 0.016$). Neither age, education nor experience correlated with attachment dimensions or the PRFQ subscales.

2.4.3 Correlations between attachment dimensions, emotional dysregulation, PRF and caregiver stress

Hypothesis 1 was partially supported. Attachment anxiety ($r = .34$, $p = <0.003$), emotional dysregulation ($r = .32$, $p = <0.005$) and pre-mentalizing ($r = .42$, $p = <0.001$) were significantly positively correlated with caregiver stress. Certainty of mental states was negatively correlated with caregiver stress ($r = -.47$, $p = <0.001$). Attachment avoidance ($r = .17$, $p = 0.142$) and interest and curiosity ($r = .09$, $p = 0.459$) were not significantly correlated with caregiver stress.

2.4.4 Correlations between attachment dimensions and the components of PRF

Hypothesis 2 was also partially supported, as some differences were observed in the relationships between each attachment dimension and the components of PRF. Attachment anxiety was significantly positively correlated with pre-mentalizing ($r = .34$, $p = 0.004$) and negatively correlated with certainty of mental states ($r = -.27$, $p = 0.021$). No significant relationship was observed between attachment anxiety and interest and curiosity. Attachment avoidance was also significantly correlated with pre-mentalizing ($r = .30$, $p = 0.01$) but not certainty of mental states ($r = -.20$, $p = 0.095$). A negative correlation with interest and curiosity was observed ($r = -.23$, $p = 0.046$); however, after adjusting for non-normality, this was no longer significant.

Table 2: Correlations between demographic characteristics and variables of interest

	Age	Education	Years of Experience	Attachment Anxiety	Attachment Avoidance	Emotional Dysregulation	Pre-mentalizing	Certainty of Mental States	Interest and Curiosity	Caregiver Stress
Age										
Education	-.125 [-.334, .093]									
Years of Experience	**.497**** **[.338, .675]**	**-.264*** **[-.448, -.030]**								
Attachment Anxiety	-.097 [-.319, .158]	.069 [-.171. .312]	-.059 [-.250, .116]							
Attachment Avoidance	.076 [-.209, .333]	-.142 [-.334, .094]	.109 [-.148, .315]	**.664**** **[.409, .859]**						
Emotional Dysregulation	-.206 [-.447, .076]	.030 [-.201, .257]	**-.280*** **[-.453, -.103]**	**.629**** **[.443, .767]**	**.479**** **[.305, .641]**					
Pre-mentalizing	-.049 [-.304, .266]	-.001 [-.224, .173]	-.127 [-.282, .009]	**.335**** **[.039, .574]**	**.299*** **[.103, .481]**	**.448**** **[.043, .701]**				
Certainty of Mental States	-.182 [-.387, .041]	-.080 [-.279, .137]	.001 [-.204, .205]	**-.270*** **[-.494, -.044]**	-.197 [-.390, -.005]	-.084 [-.338, .148]	-.123 [-.380, .074]			
Interest and Curiosity	-.191 [-.410, .057]	.063 [-.167, .291]	-.112 [-.327, .083]	-.073 [-.350, .182]	-.234* [-.485, .031]	-.181 [-.435, .065]	**-.341**** **[-.553, -.131]**	-.013 [-.246, .229]		
Caregiver Stress	-.013 [-.214, .198]	**.272*** **[.002, .496]**	-.123 [-.281 - .043]	**.344**** **[.086, .558]**	.174 [-.039 - .367]	**.323**** **[.099, .503]**	**.419**** **[.226, .605]**	**-.467**** **[-.639, -.273]**	.088 [-.138 - .303]	

**. Correlation is significant at the 0.01 level (2-tailed, uncorrected).
*. Correlation is significant at the 0.05 level (2-tailed, uncorrected).
Bias-corrected bootstrapped 95% confidence intervals given in brackets

2.4.5 Predicting caregiver stress from attachment dimension, emotional dysregulation and PRF

To test hypothesis 3, hierarchical regression analyses were conducted separately for each attachment dimension. Education was entered as a covariate in the first step, followed by attachment dimension, emotional dysregulation in step 3 and the three components of PRF in step 4. Regression models are presented in Table 3 for attachment anxiety and Table 4 for attachment avoidance.

2.4.5.1 Attachment Anxiety

Each step significantly increased the explained variance, except for step 3. As shown in Table 3, the final model accounted for 42% of the variance, F (6, 66) = 9.77, p = <0.001. In this model, higher levels of education (β = .22, p = 0.041, bootstrapped 95% CIs = 0.37 - 4.94), pre-mentalizing (β = .38, p = 0.003, bootstrapped 95% CIs = 2.05 – 8.05) and interest and curiosity (β = .23, p = 0.049, bootstrapped 95% CIs = 2.05 – 8.05), and lower certainty of mental states (β = -.38, p = <0.001, bootstrapped 95% CIs = -6.44 - -2.27), significantly predicted greater caregiver stress. Despite attachment anxiety and emotional dysregulation being significantly correlated with caregiver stress, neither were significant predictors in the final model. Attachment anxiety no longer significantly predicted caregiver stress once emotional dysregulation was introduced, suggesting overlapping variance.

2.4.5.2 Attachment Avoidance

Each step significantly increased the explained variance. As shown in Table 4, the final model accounted for 42% of the variance, F(6, 66) = 9.75, p = <0.001. In this model, higher levels of education (β = .22, p = 0.05, bootstrapped 95% CIs = 0.36 – 5.10) and pre-mentalizing (β = .38, p = 0.004, bootstrapped 95% CIs = 2.32 – 8.25), and lower certainty of mental states (β = -.39, p = <0.001, bootstrapped 95% CIs = -6.61 - -2.27), significantly predicted greater caregiver stress. Interest and curiosity did not reach significance. Attachment avoidance did not predict caregiver

stress once emotional dysregulation was entered, and emotional dysregulation was no longer significant when the components of PRF were entered, suggesting shared variance between attachment avoidance, emotional dysregulation and the components of PRF.

Table 3: Regression models predicting caregiver stress from attachment anxiety, emotional dysregulation and the components of PRF

Model Fit	Predictors	Unstandardised B	Standardised β	Bootstrapped SE	Bootstrapped *p*	Bootstrapped Bias-corrected 95% confidence intervals Lower	Upper
	Model 1, F, (1, 71) = 5.67, p = 0.02						
R^2 = .074	Education	3.34	.27	1.66	0.051	.13	6.70
Adj R^2 = .061							
	Model 2, F(2, 70) = 7.68, p = <0.001						
R^2 = .180	Education	3.06	.25	1.46	0.036	.18	5.89
Adj R^2 = .157	Attachment Anxiety	3.01	.33	1.17	0.011	.99	5.13
	Model 3, F(3, 69) = 7.76, p = 0.001						
R^2 = .200	Education	3.09	.25	1.47	0.036	.14	5.96
Adj R^2 = .165	Attachment Anxiety	2.00	.21	1.51	0.190	-.86	4.87
	Emotional Dysregulation	3.50	.18	2.49	0.167	-1.27	8.41
	Model 4, F(6, 66) = 9.77, p = <0.001						
R^2 = .470	Education	2.72	.22	1.26	0.041	.37	4.94
Adj R^2 = .422	Attachment Anxiety	0.27	.03	1.44	0.844	-2.39	2.98
	Emotional Dysregulation	2.64	.14	2.21	0.245	-1.53	7.48
	Pre-mentalizing	4.79	.38	1.45	0.003	2.05	8.05
	Certainty of mental states	-4.19	-.38	1.09	<.001	-6.44	-2.27
	Interest and curiosity	3.98	.26	2.02	0.049	2.05	8.05

Table 4: Regression models predicting caregiver stress from attachment avoidance, emotional dysregulation and the components of PRF

Model Fit	Predictors	Unstandardised B	Standardised β	Bootstrapped SE	Bootstrapped *p*	Bootstrapped Bias-corrected 95% confidence intervals	
						Lower	Upper
	Model 1, F, (1, 71) = 5.67, p = 0.02						
R^2 =.074	Education	3.34	.27	1.66	0.051	0.13	6.70
Adj R^2 = .061							
	Model 2, F(2, 70) = 4.78, p = 0.011						
R^2 = .120	Education	3.72	.30	1.63	0.022	0.64	6.86
Adj R^2 = .095	Attachment Avoidance	2.14	.22	1.00	0.036	0.19	3.91
	Model 3, F(3, 69) = 4.99, p = 0.003						
R^2 = .178	Education	3.38	.28	1.57	0.037	0.08	6.47
Adj R^2 = .143	Attachment Avoidance	0.80	.08	1.19	0.496	-1.77	2.78
	Emotional Dysregulation	5.28	.28	2.26	0.020	0.56	9.59
	Model 4, F(6, 66) = 9.75, p = <0.001						
R^2 = .470	Education	2.72	.22	1.32	0.050	0.36	5.60
Adj R^2 = .422	Attachment Avoidance	-0.08	-.01	1.21	0.950	-2.49	1.88
	Emotional Dysregulation	3.02	.16	2.12	0.160	-1.13	7.56
	Pre-mentalizing	4.82	.38	1.42	0.004	2.32	8.25
	Certainty of mental states	-4.27	-.39	2.02	<0.001	-6.61	-2.27
	Interest and curiosity	3.98	.23	1.08	0.054	0.39	8.80

2.4.6 Exploring the influence of emotional dysregulation on the relationship between attachment dimensions and PRF

To test hypothesis 4, a series of moderation analyses using hierarchical linear regression were conducted (Baron & Kenny, 1986; Hayes, 2009). Separate analyses were conducted for each attachment dimension. Attachment dimension, emotional dysregulation and an interaction term between these were entered as predictors of each component of PRF. Each predictor was added in a separate step to aid interpretation. Significant zero-order correlations between the predictor and outcome variables were not required, due to the possibility of suppression effects. Regression models are shown in Table 5 for attachment anxiety and Table 6 for attachment avoidance. Visual representations of the analyses, constructed using the PROCESS macro (Hayes, 2022), are shown in Figure 1.

2.4.6.1 Attachment Anxiety

Pre-mentalizing. Attachment anxiety did not predict pre-mentalizing in any step. Emotional dysregulation approached significance in the second step (β = .39, p = 0.060, bootstrapped 95% CIs = 0.03 – 1.02) but was no longer significant when the interaction term was added. This step explained 20.60% of the variance. Adding the interaction term did not significantly increase the explained variance, nor was the interaction term a significant predictor.

Certainty of mental states. Attachment anxiety significantly negatively predicted certainty of mental states in steps 1 and 2, but was no longer significant when the interaction term was added (β = -.79, p = 0.058, bootstrapped 95% CIs = -1.30 – 0.15). Neither emotional dysregulation nor the interaction term significantly predicted certainty of mental states. Step 2 explained 8.50% of the variance, $F(2, 70) = 3.26$, p = 0.044, and the addition of the interaction term did not significantly increase the amount of variance explained.

Interest and Curiosity. No significant predictors were identified at any step.

2.4.6.2 Attachment Avoidance

Pre-mentalizing. Attachment avoidance significantly predicted pre-mentalizing in step 1 (β = .30, p = 0.012, bootstrapped 95% CIs = 0.10 – 0.42), though this model only explained 9.00% of the variance. Attachment avoidance was no longer significant when emotional dysregulation was added, and emotional dysregulation was not a significant predictor. The interaction term was non-significant, and adding this predictor did not significantly increase the explained variance.

Certainty of mental states. Attachment avoidance negatively significantly predicted certainty of mental states only when the interaction term was added, (β = -0.95, p = 0.030, bootstrapped 95% CIs = -1.60 – 0.089). The interaction approached significance (β = 1.20, p = 0.065, bootstrapped 95% CIs = -0.03 – 0.71). In both cases, these were not significant when adjusting for non-normality. This final model explained only 8.40% of the variance. This step resulted in the largest R^2 change (R^2 change = 0.046, F (1, 69) = 3.43, p = 0.068), despite the model being non-significant overall. No other significant predictors were observed at any stage.

Interest and Curiosity. Attachment avoidance significantly negatively predicted interest and curiosity in the first step only (β = -0.23, p = 0.048, bootstrapped 95% CIs = -0.26 – 0.01), though once correcting for non-normality, this was not significant. Overall, the first model was significant, explaining 5% of the variance (F (1, 71) = 4.13, p = 0.046). Emotional dysregulation and the interaction term were not significant predictors, and did not significantly increase the explained variance.

Table 5: Analysis of moderation effects of attachment anxiety and emotional dysregulation on the components of PRF

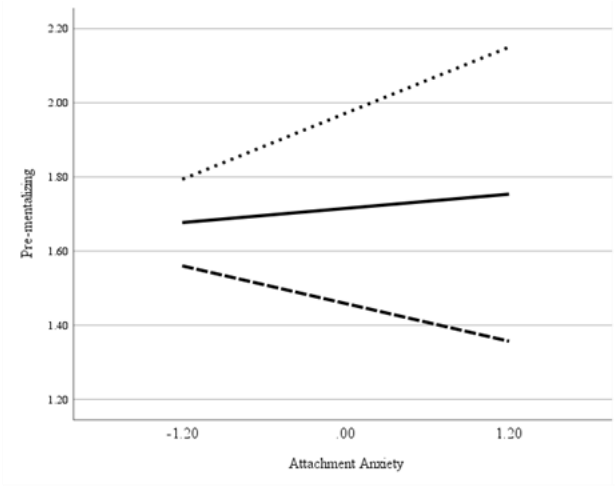
Model Fit	Predictors	Unstandardised B	Standardised β	Bootstrapped SE	Bootstrapped *p*	Bootstrapped Bias-corrected 95% confidence intervals Lower	Upper
DV: Pre-mentalizing							
	Model 1, F, (1, 71) = 8.97, p = 0.004						
R^2 = .112	Attachment Anxiety	0.25	.34	.13	0.072	0.04	0.48
Adj R^2 = .100							
	Model 2, F(2, 70) =9.07, p = <0.001						
R^2 = .206	Attachment Anxiety	0.065	.09	.09	0.461	-0.09	0.24
Adj R^2 = .183	Emotional Dysregulation	0.592	.39	.28	0.060	0.03	1.02
	Model 3, F(3, 69) = 7.15, p = <0.001						
R^2 = .237	Attachment Anxiety	-0.320	-.43	.42	0.414	-0.96	0.77
Adj R^2 = .204	Emotional Dysregulation	-0.012	-.01	.55	0.982	-1.05	1.36
	Attachment Anxiety * Emotional Dysregulation	0.195	.85	.22	0.353	-0.27	0.46
DV: Certainty of Mental States							
	Model 1, F, (1, 71) =5.593 , p = 0.021						
R^2 = .073	Attachment Anxiety	-0.233	-.27	.11	0.036	-0.47	-0.02
Adj R^2 = .0.60							
	Model 2, F(2, 70) = 3.262, p = 0.044						
R^2 = .085	Attachment Anxiety	-0.310	-.36	.12	0.017	-0.56	-0.06
Adj R^2 = .059	Emotional Dysregulation	0.246	.14	.25	0.339	-0.25	0.68
	Model 3, F3, 69() = 2.744, p = 0.050						
R^2 = .107	Attachment Anxiety	-0.676	-.79	.38	0.058	-1.30	0.15
Adj R^2 = .068	Emotional Dysregulation	-0.327	-.19	.58	0.568	-1.54	0.83
	Attachment Anxiety * Emotional Dysregulation	0.185	.70	.18	0.267	-0.24	0.51
DV: Interest and Curiosity							
	Model 1, F, (1, 71) = 0.381 , p = 0.539						
R^2 = .005	Attachment Anxiety	-0.039	-.07	.07	0.571	-0.17	0.08
Adj R^2 = -.009							
	Model 2, F, (2, 70) = 1.296, p = 0.280						
R^2 = .036	Attachment Anxiety	0.037	.07	.09	0.682	-0.13	0.20
Adj R^2 = .008	Emotional Dysregulation	-0.242	-.22	.17	0.162	-0.59	0.11
	Model 3, F(3, 69) = 0.954, p = 0.420						
R^2 = .040	Attachment Anxiety	-0.064	-.12	.217	0.765	-0.498	0.35
Adj R^2 = -.002	Emotional Dysregulation	-0.400	-.37	.322	0.197	-1.033	0.28
	Attachment Anxiety * Emotional Dysregulation	0.051	.31	.103	0.554	-0.156	0.26

Table 6: Analysis of moderation effects of attachment avoidance and emotional dysregulation on the components of PRF

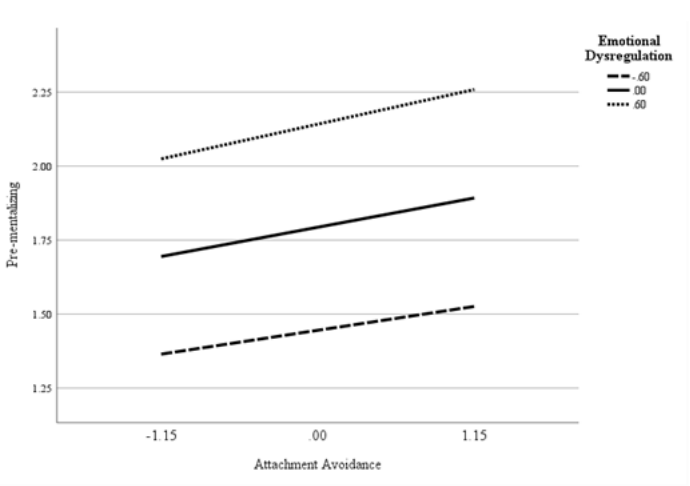
Model Fit	Predictors	Unstandardised B	Standardised β	Bootstrapped SE	Bootstrapped *p*	Bootstrapped Bias-corrected 95% confidence intervals Lower	Upper
DV: Pre-mentalizing							
	Model 1, F, (1, 71) = 6.990, p = 0.010						
R^2 = .090	Attachment Avoidance	0.23	.09	.09	0.012	0.10	0.42
Adj R^2 = .077							
	Model 2, F(2, 70) = 9.330, p = <0.001						
R^2 = .210	Attachment Anxiety	0.09	.11	.07	0.249	-0.07	0.24
Adj R^2 = .188	Emotional Dysregulation	0.60	.40	.32	0.087	-0.07	1.06
Model 3, F(3, 69) = 6.142, p = <0.001							
R^2 = .211	Attachment Avoidance	0.04	.05	.38	0.932	-0.78	0.81
Adj R^2 = .176	Emotional Dysregulation	0.52	.35	.52	0.318	-0.61	1.43
	Attachment Avoidance * Emotional Dysregulation	0.03	.10	.21	0.919	-0.30	0.43
DV: Certainty of Mental States							
	Model 1, F, (1, 71) = 2.866, p = 0.095						
R^2 = .039	Attachment Avoidance	-0.18	-.20	.10	0.072	-0.38	0.03
Adj R^2 = .025							
	Model 2, F(2, 70) = 1.418, p = 0.249						
R^2 = .039	Attachment Avoidance	-0.18	-.20	.11	0.079	-0.40	0.04
Adj R^2 = .011	Emotional Dysregulation	0.024	.01	.25	0.927	-0.50	0.46
	Model 3, F(3, 69) = 2.122, p = 0.105						
R^2 = .084	Attachment Avoidance	-0.85	-.95	.40	0.030	-1.60	0.09
Adj R^2 = .045	Emotional Dysregulation	-1.06	-.61	.69	0.125	-2.44	0.43
	Attachment Avoidance * Emotional Dysregulation	0.37	1.20	.21	0.065	-0.03	0.71
DV: Interest and Curiosity							
	Model 1, F, (1, 71) = 4.126, p = 0.046						
R^2 = .055	Attachment Avoidance	-0.131	-.234	.07	0.048	-0.26	0.01
Adj R^2 = .042							
	Model 2, F, (2, 70) = 2.279, p = 0.110						
R^2 = .061	Attachment Avoidance	-0.107	-.191	.08	0.203	-0.26	0.09
Adj R^2 = .034	Emotional Dysregulation	-0.097	-.090	.15	0.506	-0.37	0.18
	Model 3, F(3, 69) = 1.507, p = 0.220						
R^2 = .061	Attachment Avoidance	-0.070	-.126	.21	0.744	-0.47	0.42
Adj R^2 = .021	Emotional Dysregulation	-0.038	-.035	.37	0.919	-0.70	0.70
	Attachment Avoidance * Emotional Dysregulation	-0.020	-.11	.11	0.839	-0.27	0.19

Figure 1: Graphs to illustrate moderation analyses

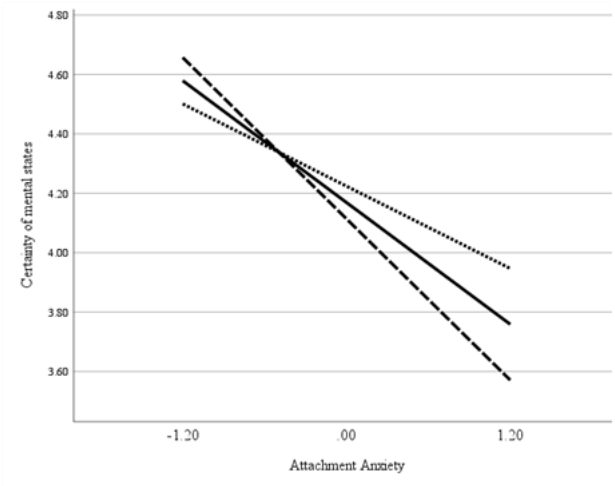
Line graphs of the relationship between the attachment dimensions and components of PRF at mean, high and low (based on SD) levels of emotional dysregulation



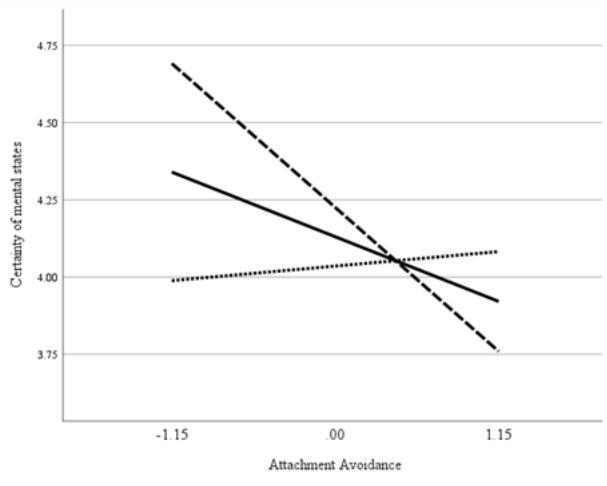
Interaction $\beta = 0.847, p = 0.353$



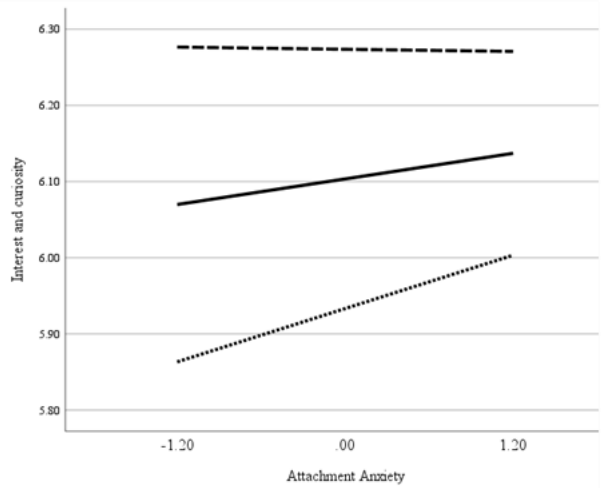
Interaction $\beta = .098, p = 0.919$



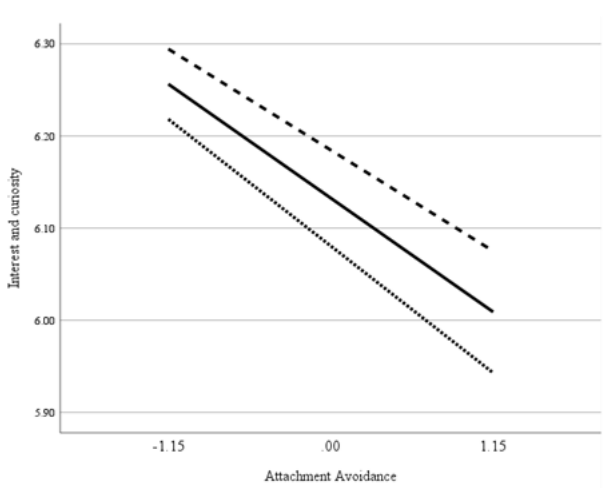
Interaction $\beta = 0.699, p = 0.267$



Interaction $\beta = .1.199, p = 0.065$



Interaction $\beta = 0.307, p = 0.554$



Interaction $\beta = -0.105, p = 0.839$

2.5 Discussion

This study investigated cross-sectional associations between attachment dimensions, emotional dysregulation, PRF and caregiver stress amongst foster carers. Exploratory analyses were also conducted to examine the role of emotional dysregulation in the relationship between each attachment dimension and the components of PRF. Associations were observed between the key variables, with the attachment dimensions differing in the strength and pattern of these relationships. The results suggest that PRF is predictive of caregiver stress, and that attachment dimensions and emotional dysregulation also have a role in this association through overlapping variance with the components of PRF. In the exploratory analyses, emotional dysregulation was not found to moderate an association between attachment dimensions and the components of PRF. The findings are broadly consistent with research involving birth parents. Several areas for further research are indicated.

Caregiver stress was found to be correlated with attachment anxiety, emotional dysregulation and two of the three components of PRF (pre-mentalizing and certainty of mental states). The finding that attachment anxiety, but not avoidance, positively correlated with caregiver stress is consistent with prior research involving birth families (Mazzeschi et al., 2015; Nijessens et al., 2018), although other studies have observed associations between both attachment dimensions and caregiver stress (Jones et al., 2015). The present findings might be consistent with observations that more avoidantly attached individuals tend to under-report difficulties (Mikulincer & Shaver, 2007), which could partly explain this pattern of results. The finding that pre-mentalizing was positively associated with caregiver stress is also consistent with prior research using the PRFQ (Luyten et al., 2017; Nijessens et al., 2018), and with theoretical accounts that greater difficulty considering the child's perspective would result in greater stress due to the absence of the protective effect of appropriate mentalizing on carers' wellbeing (Staines et al., 2019). In contrast to previous research, a significant relationship between lower certainty of mental states and greater caregiver stress was observed. Thus, it is not clear whether this finding is specific to foster carers. Feeling unsure of the child's internal state may increase stress by reducing the adult's sense of competence (De Roo et al., 2019), and this effect may be more pronounced amongst foster carers, who have not cared for their child from birth. Further research could investigate this discrepancy between birth parents and foster carers. Additionally, greater emotional dysregulation was associated with parenting stress. Theoretically, difficulty regulating emotion would exacerbate stressors due to less effective strategies for managing such stressors (Gratz & Roemer, 2004). Alternatively, experiencing higher levels of parenting stress may also diminish the capacity for more effective emotion regulation, and therefore this relationship may be bidirectional.

The hypothesis that attachment anxiety and avoidance would show a different pattern of relationships to the three components of PRF was partly supported. As expected, both attachment dimensions were positively related to pre-mentalizing, consistent with previous studies (Luyten et al., 2017[B]; Nijessens et al., 2018; Pazzagli et al., 2018). Certainty of mental states was only significantly related to attachment anxiety, but not avoidance, in contrast to these previous studies where no relationship with certainty of mental states was observed (Luyten et al., 2017[B]; Moreira & Fonesca, 2022; Nijessens et al., 2018; Pazzagli et al., 2018). Therefore, the suggestion that anxious attachment representations are associated with intrusive mentalizing (Luyten et al., 2017[B]) was not supported. An alternative possibility is that more anxiously attached individuals may be more concerned about whether they have accurately understood their child's feelings than avoidantly attached individuals, due to their greater preoccupation in relationships (Hazan & Shaver, 1987). Attachment avoidance was negatively related to interest and curiosity, but became non-significant after adjusting for non-normality in the data. This relationship was also observed in two validation studies of the PRFQ (Moreira & Fonesca, 2022; Pazzagli et al., 2018), but not the original validation study (Luyten et al., 2017[A]). This association is theoretically expected, as more avoidant individuals would be expected to have more difficulty attending to their own and others' emotions (Searle & Meara, 1999). In view of the conflicting findings from this and other studies, more research may be required to assess whether this relationship is present or meaningful amongst both parents and foster carers.

When investigating predictors of parenting stress, similar patterns were also observed for each attachment dimension, despite the different pattern of correlational results. In both models, the attachment dimension was no longer significant once emotional dysregulation was entered, and emotional dysregulation was no longer significant once the components of PRF were entered. This pattern of results indicates overlapping variance between these constructs, suggestive of potential mediation effects. In this study, the ordering of variables was based on theoretical considerations: attachment representations develop early in life and are theorised to influence the development of emotion regulation strategies and PRF. However, attachment and emotion regulation strategies are not necessarily fixed across the lifespan (Zhang & Labouvie-Vief, 2004). Stress also activates the attachment system, potentially reducing effective emotion regulation and limiting capacity to access PRF (Fonagy & Luyten, 2009), potentially creating a vicious cycle. Therefore, research using longitudinal designs is necessary to investigate these proposed mechanisms.

The finding that pre-mentalizing statistically predicted caregiver stress is consistent with Nijessens et al.'s (2018) observation that pre-mentalizing mediated the relationship between both attachment dimensions and parenting stress in birth families. However, in this study, certainty of mental states was also identified as a significant negative predictor, and interest and curiosity a significant positive

predictor, in the model for attachment anxiety only. Therefore, it is unclear whether this pattern of results is specific to foster carers, or methodological differences, as Nijessens et al. (2018) used a different measure of parenting stress. It is surprising that higher interest and curiosity was predictive of greater caregiver stress. Amongst foster carers, greater curiosity towards the child's internal world, but a lower sense of certainty in their interpretation of the child's visible emotions and behaviour, may indicate a lack of perceived competence or efficacy, which may then result in greater stress. However, this possibility was not directly tested in the current study, so could be addressed by future research.

The moderation analyses were largely inconclusive. Visual representation of the data suggested possible moderation effects for certainty of mental states and both attachment dimensions, and for pre-mentalizing with attachment anxiety only. Emotional dysregulation also appeared to be associated with pre-mentalizing. However, these results were not statistically significant. As the observed effects sizes were large, lack of statistical power is a possible explanation for the non-significant findings, and therefore further investigation is warranted.

2.5.1 Limitations and Future Directions

This research was novel in incorporating emotional dysregulation into the investigation of attachment dimensions, PRF and caregiver stress, and in extending research with birth parents to foster carers. Despite the theoretical rationale for the ordering of variables, the study design was cross-sectional, and therefore causality cannot be determined. The sample size was also relatively small, and several analyses were underpowered, particularly the moderation analyses. Although relevant covariates were considered on the basis of previous research (age, education and fostering experience), several other confounding variables, such as the number of children previously fostered or experience parenting birth children, could have also been considered. Therefore, investigation using longitudinal designs, with larger samples, are required to increase the credibility of the findings by employing more sophisticated analyses and the ability to consider a broader range of covariates.

Foster carers are arguably a difficult population to recruit (Bergsund et a., 2020) and the sampling strategy may not have resulted in a representative sample. For instance, foster carers who are experiencing less caregiver stress may be more motivated to take part in research. This could explain why the sample generally reported low levels of caregiver stress. This is surprising, as previous research has found that foster carers report elevated caregiver stress on the Parenting Stress Scale (Harding et al., 2018; 2020), and higher parenting stress scores than birth parents (Bergsund et al., 2020). Alternatively, despite the study being anonymous, participants may have been concerned about reporting stress or difficulties in the relationship with their child due to the

increased scrutiny faced by foster carers, as professionals, compared to birth parents. Future studies should therefore consider alternative sampling strategies to ensure a range of experiences are captured.

Additionally, white participants were over-represented in the sample, at over 90%, compared to 82% of UK foster carers (Ofsted, 2022). This therefore limits the generalisability of the results, as sociocultural factors may influence norms around communication, emotional expression and expectations for children's behaviour, which may influence the relationships investigated in this study. There is a need for wider representation in fostering research, due to the increasing ethnic diversity of UK foster carers (Ofsted, 2022), and the growing need to care for unaccompanied asylum-seeking children (Office for National Statistics, 2022).

Due to low statistical power and the exploratory nature of the hypotheses, only the DERS total score was analysed. As the DERS assesses a range of emotion regulation strategies, which have been demonstrated to relate differently to each attachment dimension, investigating individual subscales may have revealed moderation effects between attachment and PRF. Future studies could seek to address this possibility. Additionally, attachment anxiety and avoidance were also moderately correlated, and dimensional measures of attachment do not easily capture the effects of scoring low or high on both anxiety and avoidance (i.e. secure and fearful-avoidant attachment styles, respectively; Bartholomew & Horrowitz, 1991). Individuals scoring highly on both attachment dimensions may use different emotion regulation strategies, and demonstrate different patterns of PRF, to individuals scoring highly on only one or neither. Future research could seek to overcome these issues with measuring attachment dimensions in order to investigate the full range of possible scoring patterns.

2.5.2 Clinical Implications

The association between PRF and parenting stress has implications for services supporting foster carers, as these results suggest that promoting foster carers' PRF may reduce the negative consequences of caregiver stress, or that attending to foster carers' level of PRF may indicate their level of stress or needs for further support. This may be particularly relevant as foster carers with a more avoidant attachment pattern may be less likely to report stress, despite higher attachment avoidance being associated with less optimal PRF. Whilst observations of pre-mentalizing may clearly indicate the need for support, professionals supporting foster carers should also consider the association between lower certainty of mental states and greater stress, and how foster carers may be affected by feeling that they do not understand their foster child. As emotional dysregulation was related to both caregiver stress and PRF, strategies to support emotion regulation may be an effective

component of programmes to promote optimal PRF in foster carers. These benefits may be direct, by improving reflection, or indirect, by lowering stress. Future studies of foster carer programmes could build on recent research investigating whether adding emotion regulation skills to a parenting intervention leads to greater improvements in PRF (Zimmer-Gembeck et al., 2019).

2.5.3 Conclusions

In summary, this study adds to the literature on attachment, emotion regulation and PRF, and extends these findings to foster carers. The findings suggest that attachment dimensions, emotional dysregulation and PRF have a role in predicting caregiver stress, and that subtle differences in these relationships exist for each of the attachment dimensions. The association between pre-mentalizing and caregiver stress is consistent with previous research amongst birth parents, but the current study suggests that certainty of mental states and interest and curiosity may also be associated with caregiver stress. Future research should consider whether these novel findings are specific to foster carers, employ longitudinal designs to investigate the mechanisms of the observed associations, and consider the potential for emotion regulation to influence PRF and stress. Awareness of the observed relationships may be beneficial to professionals working with foster carers to understand their experiences. The results add to the growing recognition of the importance of PRF for supporting foster carers in their role, thereby securing better outcomes for children in care.

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Appendix A: Author Guidelines for Attachment and Human Development

2.7 About the Journal

Attachment & Human Development is an international, peer-reviewed journal publishing high-quality, original research. Please see the journal's Aims & Scope for information about its focus and peer-review policy.

Please note that this journal only publishes manuscripts in English.

Attachment & Human Development accepts the following types of article:

- mpirical Reports, Theory/Review Papers and Clinical Case Studies

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2.10 Preparing Your Paper

2.10.1 Article Types

2.10.1.1 Empirical Reports, Theory/Review Papers and Clinical Case Studies

- Should be written with the following elements in the following order: title page; abstract; keywords; main text introduction, materials and methods, results, discussion; acknowledgments; declaration of interest statement; references; appendices (as appropriate); table(s) with caption(s) (on individual pages); figures; figure captions (as a list)
- Should be between 6000 and 7500 words, inclusive of:
    - Abstract
- Should contain any number of **keywords**. Read making your article more discoverable, including information on choosing a title and search engine optimization.

2.10.2 Style Guidelines

Please refer to these quick style guidelines when preparing your paper, rather than any published articles or a sample copy.

Any spelling style is acceptable so long as it is consistent within the manuscript.

Please use double quotation marks, except where "a quotation is 'within' a quotation".

Please note that long quotations should be indented without quotation marks.

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Updated 17th March 2023

Appendix B: Full Inclusion and Exclusion Criteria for Systematic Review

	Inclusion Criteria	Exclusion Criteria
Publication Type	• Empirical studies (observational and experimental studies) employing quantitative methods • Articles must be peer reviewed • Articles must be written in the English language • A full text must be available	• Qualitative studies • Narrative reviews • Editorials, book reviews or commentaries • Study protocols • Non-peer-reviewed papers or conference presentations
Population	Healthy birth parents of healthy children (drawn from a general population with no diagnosed physical or mental health conditions)	• Professional carers who do not live with the children they care for (e.g. staff in residential homes or hospitals) • Foster/adoptive parents • Parents with mental health diagnoses • Parents engaging in substance misuse • Parents considered 'at risk' for social services involvement • Parents of children with mental health problems, developmental disabilities or chronic physical health conditions • Expectant parents
Domain of study/Outcomes of interest	1. Includes a standardised measure of parental reflective functioning: - Parental Reflective Functioning Questionnaire - Reflective Functioning scale applied to the Parent Development Interview 2. Psychological factors within the individual associated with increased or parental reflective functioning. These are assumed to be stable characteristics Examples include: Coping style Emotion regulation Emotional expression / alexithymia (lack of insight into emotion) Parental self-efficacy Personality traits Self-esteem	1. No appropriate measure of Parental Reflective Functioning - Measure of parental sensitivity, min-mindedness or mentalizing without a standardised measure of reflective functioning - Reflective functioning scale applied to the Adult Attachment Interview (therefore not specific to the parenting role) 2. Studies not investigating relationships between Parental Reflective Functioning and intrapersonal psychological characteristics, e.g.: • Studies investigating relationships between parental reflective functioning and child outcomes rather than parent characteristics (e.g. behaviour, attachment security etc) • Studies investigating the link between Parental Reflective functioning and: o Biological factors (e.g. hormone levels, areas of neural activity, genes)

		○ Social factors (e.g. parental education, employment, socioeconomic status, drug use) ○ Specific behaviours or practices ○ Environmental factors ○ Mental health diagnoses ○ Life events (e.g. trauma history) ○ Adult attachment style ○ Satisfaction with relationships/perceived relationship quality ○ Parenting stress ○ Different forms of mentalizing (e.g. correlations between reflective function and maternal sensitivity, without testing an association with an intrapersonal psychological characteristics)

Appendix C: Quality Assessment of Included Studies

Reference	1. Question/ objective sufficiently described?		2. Design evident and appropriate to answer study question?		3. Method of subject selection (and comparison group selection, if applicable) or source of information/ input variables (e.g., for decision analysis) is described and appropriate.		4. Subject (and comparison group, if applicable) characteristics or input variables/ information (e.g., for decision analyses) sufficiently described?		5. If random allocation to treatment group was possible, is it described?		6. If interventional and blinding of investigators to intervention was possible, is it reported?		7. If interventional and blinding of subjects to intervention was possible, is it reported?		8. Outcome and (if applicable) exposure measure(s) well defined and robust to measurement / misclassification bias? Means of assessment reported?		9. Sample size appropriate?		10. Analysis described and appropriate?		11. Some estimate of variance (e.g., confidence intervals, standard errors) is reported for the main results/ outcomes (i.e., those directly addressing the study question/ objective upon which the conclusions are based)?		12. Controlled for confounding?		13. Results reported in sufficient detail?		14. Do the results support the conclusions?		Quality Score			
	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Total	Possible	Score	%
Ahrnberg, H., Pajulo, M., Scheinin, N. M., Karlsson, L., Karlsson, H., & Karukivi, M. (2020).	2		2	Design not explicitly stated but easily identified and sufficient to address the study aims	2	Sampling strategy appropriate and described fully elsewhere.	2	Demographics characteristics and potential confounders collected and reported (mix of in-text and in figures)	N/A	Observational study	N/A	Observational study	N/A	Observational study	2	Standardised questionnaires and scoring procedures used. One measure was adapted from the original but this adapted version had been piloted in a previous study.	2		1	Methods well-described and appropriate, but not stated whether corrections for multiple testing were applied.	2	SE reported for the regression models	N/A	Cross-sectional study (but potential confounds identified and controlled)	2	All mentioned outcomes reported	1	Conclusions are supported by the results, but -ve/non-sig results not discussed	18	20	0.90	
Arikan, G., & Kumru, A. (2021).	2	Aims are described in the introduction section.	2	Design not explicitly stated but easily identified and appropriate.	2	Sampling strategy appropriate and described, including inclusion criteria.	2	Participants characteristics clearly described and replicable	N/A	Observational study	N/a	Observational study	N/A	Observational study	2	Standardised measures used and psychometric properties of these measures is reported.	2	Sample size appears appropriate, no SE > 1/2 ES	1	Analysis described and appropriate, but no indication of suitability for parametric tests or correction for multiple tests. Limits of corss-sectional design acknowledged (i.e. not inferring cause)	2	SE and CI reported for path models.	N/A	Cross-sectional study (but potential confounds identified and controlled)	2	All outcomes reported in detail	2	Conclusions are based on all relevant results (-ve and +ve findings)	19	20	0.95	
De Roo, M., Wong, G., Rempel, G. R., & Fraser, S. N. (2019).	2	Aim clearly described in the introduction section.	2	Design not explicitly stated but easily identified and appropriate.	1	Method of subject selection may have led to some bias (online study conducted through survey company).	2	Inclusion criteria and demographics characteristics reported and replicable.	N/A	Observational study	N/A	Observational study	N/A	Observational study	2	Standardised measures used and psychometric properties of these measures for this sample are reported.	2	Sample size is appropriate, no issue with poor loadings.	1	Analyses described and appropriate, but no indication of correction for multiple testing.	2	CI reported for CFA.	N/A	Cross-sectional/ descriptive study.	2	All planned analyses reported in text/supplementary information	1	Conclusions are supported by the results, but non-sig results not discussed.	17	20	0.85	
Jessee, A. (2020).	2	Aim clearly described in the introduction section.	2	Design not explicitly stated but easily identified and appropriate.	1	Method of subject selection may not be representative (advert in parenting magazine) and inclusion criteria not described.	2	Demograhpcis characteristics reported and replicable.	N/A	Observational study	N/A	Observational study	N/A	Observational study	2	Standardised measures / commonl used paradigms used with scoring procedures clearly described and replicable.	1	Insufficient sample size for regression but meets minimum threshold for some guidance. Acceptable sample size for correlations.	1	Analyses described, but no indication of testing suitability for tests selected or correction form ultiple testing. Given the sample size, suitability of regression is debateable, and justification not given.	0	No SE/CIs reported.	N/A	Cross-sectional study (but potential confounds identified and controlled)	2	All planned analyses reported in text.	1	Some conclusions supported by the data. One non-sig finding is discussed as if significant.	14	20	0.70	
Menashe-Grinberg, A., Shneor, S., Meiri, G., & Atzaba-Poria, N. (2022)	2	Aims clearly stated in the introduction section.	2	Design clearly stated and appropriate.	2	Sample selection, inclusion and exclusion criteria clearly described and appropriate.	1	Demogrpahics characteristics reported but incomplete (place of birth other than Israel not listed)	1	Allocated in order/time of year of signing up - not truly random	2	Blinding reported	N/A	Not possible for subjects to be blinded	2	Standardised measures / commonl used paradigms used with scoring procedures clearly described and replicable.	1	Sample size calculation shows study was appropriately powered for the main analysis, but slightly underpowered (.78) for some of the observed correlations.	1	Analysis described and appropriate, with correction for multiple tests for the anova but not stated for correlations.	2	SD reported for ANOVAs	N/A	Comparability of baseline characteristics not reported, but not likely to have distorted the results.	1	All planned analyses reported in sufficient detail.	2	Conclusions are based on all relevant results (-ve and +ve findings)	21	26	0.81	
Moreira, H., & Fonseca, A. (2022).	2	Aims clearly stated in the introduction section.	2	Design not explicitly stated but easily identified and appropriate.	2	Sampling strategy and inclusion criteria are described and replicable.	2	Demographics characteristics reported and replicable.	N/A	Observational study	N/A	Observational study	N/A	Observational study	2	Standardised measures and scoring procedures used and psychometric properties reported.	2	Sample size is appropriate.	1	Analysis fully described and appropriate. Data tested for normality but not stated whether correction for multiple testing was applied to the correlations table.	2	CI reported for CFA; SD reported for all variables.	N/A	Cross-sectional/ descriptive study.	2	All planned analyses reported in sufficient detail.	2	Conclusions are based on all relevant results (-ve and +ve findings)	19	20	0.95	
Nelson-Coffey, S. K., Johnson, C., & Coffey, J. K. (2021).	2	Aims clearly stated in the introduction section.	1	Design not clearly stated, but can be identified. Does address the study question but could be improved.	1	Sampling strategy and inclusion criteria described and replicable. Method of selection may have introduced some bias (recruited throuh online survey company only).	2	Dempgraphics characteristics reported and replicable.	1	Experimental conditions were randomly assigned, but method of randomisation not given.	N/A	Experimental study	N/A	Blinding of subjects would not have been possible, though they may have been unaware of the other experimental conditions in the study.	2	Standardised measures used and described. Standardised or well-described and replicable scoring procedures used.	2	A priori sample size calculation carried out; 0.9 power achieved.	1	Analyses fully described and planned to reduce likelihood of type 1 errors. However, testing normality of the data/suitability for planned analyses is not mentioned.	2	CIs reported for all analyses.	1	Participants randomised to each condition, but comparability of baseline characteristics not reported (characteristics only reported for the whole sample).	2	All planned analyses reported in sufficient detail.	1	Some conclusions are supported by the data. Non-sig results are not discussed as such. Some non-sig results appear to be interpreted as positive findings.	18	24	0.75	

Reference	1. Question/ objective sufficiently described?		2. Design evident and appropriate to answer study question?		3. Method of subject selection (and comparison group selection, if applicable) or source of information/ input variables (e.g., for decision analysis) is described and appropriate.		4. Subject (and comparison group, if applicable) characteristics or input variables/ information (e.g., for decision analyses) sufficiently described?		5. If random allocation to treatment group was possible, is it described?		6. If interventional and blinding of investigators to intervention was possible, is it reported?		7. If interventional and blinding of subjects to intervention was possible, is it reported?		8. Outcome and (if applicable) exposure measure(s) well defined and robust to measurement / misclassification bias? Means of assessment reported?		9. Sample size appropriate?		10. Analysis described and appropriate?		11. Some estimate of variance (e.g., confidence intervals, standard errors) is reported for the main results/ outcomes (i.e., those directly addressing the study question/ objective upon which the conclusions are based)?		12. Controlled for confounding?		13. Results reported in sufficient detail?		14. Do the results support the conclusions?		Quality Score			
	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Total	Possible	Score	%
Rutherford, H. J. V., Booth, C. R., Luyten, P., Bridgett, D. J., & Mayes, L. C. (2015).	2	Aims clearly described in the introduction section.	1	Design not explicitly stated but easily identified and appropriate (but other designs would have been preferable with a bigger sample size).	0	Recruitment method is not described.	2	Demographic characteristics reported and replicable.	N/A	Observational study	N/A	Quasi-experiment/observational study	N/A	Quasi-experiment/observational study	2	Standardised questionnaires and scoring procedures used. Interaction task paradigms previously published and use replicable criteria (response time).	1	Sample size appears small; no reported power calculation. Some non-parametric tests had to be used which suggests insufficient sample. Own calculation suggests sample was insufficient to detect the smallest reported sig effect.	1	Analysis described in detail and sufficient to answer question, but other methods would have been preferable if sample had been larger (regression). Suitability for parametric tests was conducted, but multiple testing not corrected.	1	Estimates of variance incomplete; not reported for all outcomes.	N/A	Observational study (though potential covariates were investigated)	1	Difficult to assess as analysis plan not sufficiently described.	1	Some condusions are supported by the data. Some non-sig findings are interpreted as 'weak relationships.'	12	20	0.60	
Rutherford, H. J. V., Goldberg, B., Luyten, P., Bridgett, D. J., & Mayes, L. C. (2013).	2	Aims clearly described in the introduction section.	2	Design not explicitly stated but easily identified and appropriate.	1	Target population and inclusion criteria well described but sampling method is not stated - part of a larger study but this study is not referenced.	2	Participants characteristics clearly described and replicable.	N/A	Observational study	N/A	Observational study	N/A	Observational study	2	Standardmised measures/paradigms used. The experimental task is described in sufficient detail to be replicable, and scored according to objective criteria (time).	1	Sample size appears small; no power calculation mentioned.	2	Analysis described and appropriate (i.e. non parametric tests used after checking normality)	1	Range reported for one outcome only; no other estimates of variance given.	N/A	Observational study (though potential covariates were investigated)	2	All planned analyses are reported in sufficient detail.	1	The main condusions are supported by the data, although a non-sig finding was interpreted as evidence against the null hypothesis, and the possibility of lack of power was not considered.	16	20	0.80	
Rutherford, H. J. V., Byrne, S. P., Crowley, M. J., Bornstein, J., Bridgett, D. J., & Mayes, L. C. (2018).	2	Aims clearly described in the introduction section.	2	Design not explicitly stated but easily identified and appropriate.	1	Description of the recruitment method is incomplete; described as part of a larger study but that study is not referenced. Inclusion/exclusion criteria not reported.	2	Demographics characteristics were collected and reported. Replicable.	N/A	Observational study	N/A	Observational study	N/A	Observational study	2	Standardised measures and scoring procedures used and psychometric properties for this sample reported for the questionnaire measures.	1	Sample size seems small. No power calculation or variance estimates reported. Own power calculation suggests study 1 had a sufficient sample but study 2.	1	Analyses are well described and likely appropriate, but no testing for normality or correction for multiple testing is reported.	0	Confidence intervals/variance estimates not reported.	N/A	Observational study (though potential covariates were investigated)	2	All planned analyses reported in sufficient detail.	2	Conclusions are supported by all results, including non-sig, which are discussed as such.	15	20	0.75	
Schultheis, A. M., Mayes, L. C., & Rutherford, H. J. V. (2019).	2	Aims are clearly described in the introduction section.	2	Design is clearly described and appropriate.	1	Sampling strategy is incompletely described, but no inappropriateness apparent (seconday data, original studies not referenced).	2	Participants characteristics clearly described and replicable.	N/A	Observational study	N/A	Observational study	N/A	Observational study	2	Standardised measures and scoring procedures used and psychometric properties reported.	1	Sufficient sample for correlations but not regression	1	Analyses described and appropriate to the research design, but regression seriously underpowered. The data were tested for normality, but correction for multiple testing is not reported.	1	No estimates of variance for statistical analyses, only SD for each variable	N/A	Observational study (though potential covariates were investigated)	2	Planned analyses are reported in sufficient detail. No unplanned analyses. One planned regression not conducted due to non-sig correlation; justification given in text.	1	Some of the results are supported by the conclusions. Non-sig results not discussed.	15	20	0.75	
Wang, X. (2022).	2	Aims are clearly described in the introduction section.	2	Design not explicitly stated but easily identified and appropiate.	1	Sampling strategy described, but indusion criteria not stated. Method of selection may have introduced some bias (recruited throuh online survey company only). However, no obvious inappropriateness.	2	Participants characteristics described and replicable.	N/A	Observational study	N/A	Observational study	N/A	Observational study	2	Standardised measures and scoring procedures used. Deviations from normal scoring procedure described and relicable. Psychometric properties reported for each measure used.	1	Incomplete justification for sample size, but no evidence of obvious inappropriateness. Some problems with low factor loadings on CFA (removed from analysis)	2	Analytic described in detail.	2	SD rpeorted for all variables, CIs reported for SEM	N/A	Observational study (though potential covariates were investigated)	2	Results fully described and reported in tables	2	Conclusions are based on all results, interpretations are tentative, and both theoretical vs methodological explanations are considered.	18	20	0.90	
Yatziv, T., Kessler, Y., & Atzaba-Poria, N. (2020).	2	Aims are clearly described in the introduction section.	2	Design not explicitly stated but easily identified and appropriate.	2	Selection method (and inclusion criteria) is described in detail elsewhere, and is appropriate.	2	Participant characteristics described in detail and replicable.	N/A	Observational study	N/A	Observational study	N/A	Observational study	2	Standardised measures and scoring procedures used. Deviations from standard procedure explained and replicable. Psychometric properties and inter-rater agreement reported.	1	Sample size appears small, no power calculation reported. Own power calculation suggests grossly underpowered for regression. Smaple size sufficient for correlations.	1	Analytic methods are reported but unsure if fully appropriate due to sample size, not rpeorting tests for normality and not reporting correction for multiple testing.	1	SD for variables only, no CIs for regressions.	N/A	Observational study (though potential covariates were investigated)	2	All planned analyses reported.	1	Some of the condusions are supported by the data. Some non-sig/marginal results are discussed as if sig; some condusions are overstated. The possibility of non-sig results being due to low power (rather than true null results) are not considered.	16	20	0.80	
Zimmer-Gembeck, M. J., Kerin, J. L., Webb, H. J., Gardner, A. A., Campbell, S. M., Swan, K., & Timmer, S. G. (2019).	2	Aims clearly described in the introduction section.	1	Design not stated but easily identified, and addresses the study question although could be improved.	2	Selection method is described, with inclusion/exclusion criteria, and appropriate.	2	Participant characteristics described in detail and replicable.	N/A	Case series	N/A	Case series	N/A	Case series	2	Standardised measures with reported psychometrics were used as outcome measures; intervention and ifdelity checks were clearly described.	1	Sample size appears appropriate. Own power calculation suggests sufficient sample for regression analyses. However, some issues with large SEs	1	Analyses described and appear appropriate, but no reports of testing the dat for normality or correcting for multiple tests.	2	SD and SEs given for the t-tests and final regression model.	N/A	Observational study	1	Results include all major outcomes. However, only the data for the final regression model is reported.	2	Conclusions are supported by all results, including non-sig, and various explanations for null/contradictory findings are considered.	16	20	0.80	

Appendix D: Ethical Approval Letter

Ymchwil Iechyd a Gofal Cymru
Health and Care Research Wales

NHS
Health Research Authority

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10 October 2022

Dear Miss Thorpe

HRA and Health and Care Research Wales (HCRW) Approval Letter

Study title:	**Investigating the Influence of Attachment Style, Emotion Regulation and Parental Reflective Functioning on Parenting Stress in Foster Carers**
IRAS project ID:	**311104**
Protocol number:	**71456**
REC reference:	**22/WM/0180**
Sponsor	**Research Integrity and Governance, University of Southampton**

I am pleased to confirm that HRA and Health and Care Research Wales (HCRW) Approval has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications received. You should not expect to receive anything further relating to this application.

Please now work with participating NHS organisations to confirm capacity and capability, in line with the instructions provided in the "Information to support study set up" section towards the end of this letter.

How should I work with participating NHS/HSC organisations in Northern Ireland and Scotland?
HRA and HCRW Approval does not apply to NHS/HSC organisations within Northern Ireland and Scotland.

If you indicated in your IRAS form that you do have participating organisations in either of these devolved administrations, the final document set and the study wide governance report

(including this letter) have been sent to the coordinating centre of each participating nation. The relevant national coordinating function/s will contact you as appropriate.

Please see IRAS Help for information on working with NHS/HSC organisations in Northern Ireland and Scotland.

How should I work with participating non-NHS organisations?
HRA and HCRW Approval does not apply to non-NHS organisations. You should work with your non-NHS organisations to obtain local agreement in accordance with their procedures.

What are my notification responsibilities during the study?

The standard conditions document "*After Ethical Review – guidance for sponsors and investigators*", issued with your REC favourable opinion, gives detailed guidance on reporting expectations for studies, including:

- Registration of research
- Notifying amendments
- Notifying the end of the study

The HRA website also provides guidance on these topics, and is updated in the light of changes in reporting expectations or procedures.

Who should I contact for further information?
Please do not hesitate to contact me for assistance with this application. My contact details are below.

Your IRAS project ID is **311104**. Please quote this on all correspondence.

Yours sincerely,
Amber Slack

Approvals Specialist

Email: approvals@hra.nhs.uk

Copy to: *Dr Linda Hammond*

Appendix E: Study Advert

FOSTER CARERS NEEDED FOR RESEARCH STUDY

WHAT IS THE STUDY ABOUT?

This study is interested in how foster carers interpret their foster child's feelings and behaviour, and the stresses and rewards of being a foster carer.

WHO CAN TAKE PART?

People who have been a registered foster carer for 6 months or more and are currently caring for at least one foster child.

WHAT DOES IT INVOLVE?

Completing an anonymous online questionnaire which should take approximately 20 minutes

Primary Researcher
Lexie Thorpe
a.h.thorpe@soton.ac.uk
IERGO ID: 71456
IRAS ID: 311104
Version 5

Take part for the chance to win a voucher worth up to £25!

Use the QR code or link to find out more!

UNIVERSITY OF Southampton

Appendix F: Participant Information Sheet

UNIVERSITY OF Southampton

Combined Participant Information Sheet and Consent Form for Online Surveys for Adult Participants

Study Title: Interpretations of Foster Children's Emotions and Caregiver Stress
Researcher: Lexie Thorpe
University email: a.h.thorpe@soton.ac.uk
ERGO no: 71456
IRAS no: 311104
Version 6
Date: 05 September 2022

You are invited to take part in the above research study. This page includes some information about the project and what it will involve, to help you to decide whether to take part.

Please read the information carefully. You may wish to contact the researcher if you have any questions. It is up to you whether you decide to take part.

What is the research about?

The researcher is a Trainee Clinical Psychologist at the University of Southampton in the United Kingdom, undertaking research as part of a Doctoral thesis. This study is investigating how foster carers interpret their foster child's feelings and behaviour. The research is also interested in how this understanding might be influenced by the carers' experience of relationships, ways of coping with feelings and the stresses and rewards of being a caregiver.

This study was approved by the Faculty Research Ethics Committee (FREC) at the University of Southampton (ERGO Number: 71456) and the West Midlands - Coventry & Warwickshire Research Ethics Committee (IRAS number 311104).

What will happen to me if I take part?

You will complete an anonymous online questionnaire which should take approximately 20 minutes.

If you are happy to complete this survey, you will need to tick (check) the box below to show your consent. As this survey is anonymous, the researcher will not be able to know whether you have participated, or what answers you provided.

The survey should be completed in one sitting, but you can take breaks as long as you leave the web page open. Your answers will not be saved if you close the browser before reaching the end.

What information will be collected?

You will be asked about your experiences of relationships with others, how you cope with feelings, and how you view your current foster child's feelings and behaviour. The survey will also ask about some stressful and rewarding aspects of being a caregiver.

You will also be asked some demographics questions, including your age and ethnicity, and how many foster children you have cared for. This is just to understand a little bit more about the foster carers who have

taken part, and your answers will be anonymous.

You do not have to answer all the questions if you do not wish to do so.

Why have I been asked to participate?

You are receiving an invitation to participate because either:

Your local NHS Looked After Child or Social Care team agreed to forward to you information about this study on the researcher's behalf

Or

You have responded to the study advert on social media.

The researcher is looking for adults who have been registered foster carers for at least six months, and are currently caring for a foster child. You will need internet access to take part. You will also need to have a good understanding of English. This is because the questionnaires will be presented online in English, and translated versions are not available. If you are able to read and understand this information sheet, this will be enough.

I am aiming to recruit up to 725 participants for this study.

What are the possible benefits of taking part?

If you decide to take part in this study, you will not receive any direct or immediate benefits. However, your participation may help researchers to understand how to support foster carers in their role, and the carer and child's wellbeing.

After completing the study, you will be able to enter a prize draw to win a shopping voucher, to thank you for your participation. There are thirteen £10, ten £15 and four £25 vouchers to be won. Your survey answers will still be anonymous if you enter.

Are there any risks involved?

It is expected that taking part in this study will not cause you any emotional discomfort or distress. However, some of the questions about your experience of relationships or stress may be of a sensitive nature. Should you feel uncomfortable, you can leave the survey at any time or contact the following resources for support:

Support Services:
Fosterline: 0800 040 7675
Relate: {HYPERLINK "https://www.relate.org.uk/"}
MIND: {HYPERLINK "https://www.mind.org.uk/"}
Samaritans: 08457 90 90 90

Resources:
Moodgym: {HYPERLINK "https://moodgym.com.au/"}
Headspace: {HYPERLINK "https://www.headspace.com/"}
Beating the Blues: {HYPERLINK "http://www.beatingtheblues.co.uk/"}

Will my participation be confidential?

Your answers to all the questions in this study will be anonymous. If you provide your email address to enter

the prize draw, or to receive updates on the study, this will be collected in a separate survey and not linked to your answers.

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

What will happen to the information collected?

All information collected for this study will be stored securely on a password protected computer and backed up on a secure server. In addition, all data will be pooled and only compiled into data summaries or summary reports, so your individual answers will not be reported on. Only the researcher and their supervisor will have access to this information.

The information collected will be analysed and written up as part of the researcher's dissertation. The research may also be presented at conferences or published in a journal in the future. The dissertation and the study data will be stored in the University of Southampton's data repository, meaning that the data may be made available to other researchers on request.

The University of Southampton conducts research to the highest standards of ethics and research integrity. In accordance with our Research Data Management Policy, data will be held for at least 10 years after the study has finished when it will be securely destroyed.

What happens if I change my mind?

You have the right to change your mind and withdraw your participation without giving a reason and without your participant rights or routine care being affected. You will be able to withdraw your data prior to finishing and submitting your survey responses. As the survey answers are anonymous, it will not be possible to withdraw your data after you have submitted your answers, as it will not be possible to identify your data.

Where can I get more information?

If you have any questions or require any further information after reading this information sheet, please contact the researcher:

Lexie Thorpe, {HYPERLINK "mailto:a.h.thorpe@soton.ac.uk"}

Research Supervisors:
Dr Katy Sivyer, Lecturer in Clinical Psychology K.A.J.Sivyer@soton.ac.uk
Dr Kate Willoughby, Clinical Psychologist K.Willoughby@soton.ac.uk

What happens if there is a problem?

If you are unhappy about any aspect of this study and would like to make a formal complaint, you can contact the Head of Research Integrity and Governance, University of Southampton, on the following contact details: Email: {HYPERLINK "mailto:rgoinfo@soton.ac.uk"}, phone: + 44 2380 595058.
Please quote the Ethics/ERGO number above. Please note that by making a complaint you might be no longer anonymous.

More information on your rights as a study participant is available via this link:
{HYPERLINK "https://www.southampton.ac.uk/about/governance/participant-information.page"}

Data Protection Privacy Notice

The University of Southampton conducts research to the highest standards of research integrity. As a publicly-funded organisation, the University has to ensure that it is in the public interest when we use personally-identifiable information about people who have agreed to take part in research. This means that when you agree to take part in a research study, we will use information about you in the ways needed, and for the purposes specified, to conduct and complete the research project. Under data protection law, 'Personal data' means any information that relates to and is capable of identifying a living individual. The University's data protection policy governing the use of personal data by the University can be found on its website (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page).

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

Our privacy notice for research participants provides more information on how the University of Southampton collects and uses your personal data when you take part in one of our research projects and can be found at http://www.southampton.ac.uk/assets/sharepoint/intranet/ls/Public/Research%20and%20Integrity%20Privacy%20Notice/Privacy%20Notice%20for%20Research%20Participants.pdf

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

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

For the purposes of data protection law, the University of Southampton is the 'Data Controller' for this study, which means that we are responsible for looking after your information and using it properly. The University of Southampton Research Data Management Policy has a requirement that all significant Research Data should be held for a minimum of 10 years. In line with this anonymised shareable data will be stored openly in the university data repository. This would allow anyone from the public to have access to the anonymised dataset if required.

To safeguard your rights, we will use the minimum personal data necessary to achieve our research study objectives. Your data protection rights – such as to access, change, or transfer such information - may be limited, however, in order for the research output to be reliable and accurate. The University will not do anything with your personal data that you would not reasonably expect.

If you have any questions about how your personal data is used, or wish to exercise any of your rights, please consult the University's data protection webpage (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page) where you can make a request using our online form. If you need further assistance, please contact the University's Data Protection Officer (data.protection@soton.ac.uk).

Thank you for reading this information sheet and considering taking part in this research.

☐ Please tick (check) this box to indicate that you have read and understood information on this form, are aged 21 or over and agree to take part in this survey.

Appendix G: Participant Questionnaires

Demographic Questionnaire

Study Title: Interpretations of Foster Children's Emotions and Caregiver Stress

Researcher: Lexie Thorpe

University email: a.h.thorpe@soton.ac.uk

ERGO no: 71456

IRAS no: 311104

Version 3

Date: 26th August 2022

Please answer the questions below:

1. What is your age?

(Participant to enter their age manually)

2. To which gender do you most identify?

Options:

- Female
- Male
- Nonbinary/Non-Conforming
- Other _____
- Prefer Not to Answer

3. What is your ethnicity?

Options:

White

- English/Welsh/Scottish/Northern Irish/British
- Irish
- Gypsy or Irish Traveller
- Any other White background, please describe

Mixed/Multiple ethnic groups

- White and Black Caribbean
- White and Black African
- White and Asian
- Any other Mixed/Multiple ethnic background, please describe

Asian/Asian British

- Indian
- Pakistani
- Bangladeshi
- Chinese

- Any other Asian background, please describe

Black/ African/Caribbean/Black British

- African
- Caribbean
- Any other Black/African/Caribbean background, please describe

Other ethnic group

- Arab
- Any other ethnic group, please describe

4. Is English you first language?
    - Yes
    - No

5. If English is not your first language, how would you describe your understanding of English? [Visual analogue scale from 'new to English' to 'fluent']

6. What is your highest level of education?

Drop down options: secondary school, college, undergraduate degree, postgraduate degree

7. Have you been a registered foster carer for longer than six months?
   Options:
    - Yes
    - No
      [If no, screened out]
8. How long have you been a registered foster carer?
   ___ years ____ months
9. Which fostering categories are you registered for?
   Options:
    - Short term
    - Long term
    - Kinship
    - Emergency
    - Respite
    - Remand
    - Fostering for adoption
    - Specialist/Therapeutic

10. Have you attended any foster carer training which included learning about attachment theory?
    Options:
    - No
    - Unsure
    - Yes, in the last year
    - Yes, in the last two years
    - Yes, in the last five years

- Yes, longer than five years ago

11. Approximately how many children have you fostered in total?
    [enter numeric value]

12. How many children are you currently fostering?
    [enter numeric value]

    If you are currently caring for more than one child, please answer all further questions in relation to the child you have been caring for the longest.

13. How old is the child you are currently fostering?
    [enter numeric value]

14. Are you currently experiencing any stressful life events unrelated to your role as a foster carer?
    [Yes / no]

THE EXPERIENCES IN CLOSE RELATIONSHIPS-REVISED (ECR-R) QUESTIONNAIRE

Scale:

The statements below concern how you feel in emotionally intimate relationships. We are interested in how you *generally* experience relationships, not just in what is happening in a current relationship. Respond to each statement by circling a number to indicate how much you agree or disagree with the statement.

QUESTION 1=Strongly Disagree…….7=Strong Agree

1. I'm afraid that I will lose my partner's love. 1 2 3 4 5 6 7

2. I often worry that my partner will not want to stay with me. 1 2 3 4 5 6 7

3. I often worry that my partner doesn't really love me. 1 2 3 4 5 6 7

4. I worry that romantic partners won't care about me as much as I care about them.
1 2 3 4 5 6 7

5. I often wish that my partner's feelings for me were as strong as my feelings for him or her.
1 2 3 4 5 6 7

6. I worry a lot about my relationships. 1 2 3 4 5 6 7

7. When my partner is out of sight, I worry that he or she might become interested in someone else. 1 2 3 4 5 6 7

8. When I show my feelings for romantic partners, I'm afraid they will not feel the same about me. 1 2 3 4 5 6 7

9. I rarely worry about my partner leaving me. 1 2 3 4 5 6 7

10. My romantic partner makes me doubt myself. 1 2 3 4 5 6 7

11. I do not often worry about being abandoned. 1 2 3 4 5 6 7

12. I find that my partner(s) don't want to get as close as I would like. 1 2 3 4 5 6 7

13. Sometimes romantic partners change their feelings about me for no apparent reason.
1 2 3 4 5 6 7

14. My desire to be very close sometimes scares people away. 1 2 3 4 5 6 7

15. I'm afraid that once a romantic partner gets to know me, he or she won't like who I really am. 1 2 3 4 5 6 7

16. It makes me mad that I don't get the affection and support I need from my partner. 1 2 3 4 5 6 7

17. I worry that I won't measure up to other people. 1 2 3 4 5 6 7

18. My partner only seems to notice me when I'm angry. 1 2 3 4 5 6 7

19. I prefer not to show a partner how I feel deep down. 1 2 3 4 5 6 7

20. I feel comfortable sharing my private thoughts and feelings with my partner. 1 2 3 4 5 6 7

21. I find it difficult to allow myself to depend on romantic partners. 1 2 3 4 5 6 7

22. I am very comfortable being close to romantic partners. 1 2 3 4 5 6 7

23. I don't feel comfortable opening up to romantic partners. 1 2 3 4 5 6 7

24. I prefer not to be too close to romantic partners. 1 2 3 4 5 6 7

25. I get uncomfortable when a romantic partner wants to be very close. 1 2 3 4 5 6 7

26. I find it relatively easy to get close to my partner. 1 2 3 4 5 6 7

27. It's not difficult for me to get close to my partner. 1 2 3 4 5 6 7

28. I usually discuss my problems and concerns with my partner. 1 2 3 4 5 6 7

29. It helps to turn to my romantic partner in times of need. 1 2 3 4 5 6 7

30. I tell my partner just about everything. 1 2 3 4 5 6 7

31. I talk things over with my partner. 1 2 3 4 5 6 7

32. I am nervous when partners get too close to me. 1 2 3 4 5 6 7

33. I feel comfortable depending on romantic partners. 1 2 3 4 5 6 7

34. I find it easy to depend on romantic partners. 1 2 3 4 5 6 7

35. It's easy for me to be affectionate with my partner. 1 2 3 4 5 6 7

36. My partner really understands me and my needs. 1 2 3 4 5 6 7

Difficulties in Emotion Regulation Scale – Short Form (DERS-SF)

Kaufman, Xia, Fosco, Yaptangco, Skidmore, & Crowell (2015)

Please indicate how often the following apply to you.

	Almost Never (0–10%)	Some-times (11–35%)	About Half Of the Time (36–65%)	Most of the Time (66–90%)	Almost Always (91–100%)
1. I pay attention to how I feel	1	2	3	4	5
2. I have no idea how I am feeling	1	2	3	4	5
3. I have difficulty making sense out of my feelings	1	2	3	4	5
4. I care about what I am feeling	1	2	3	4	5
5. I am confused about how I feel	1	2	3	4	5
6. When I'm upset, I acknowledge my emotions	1	2	3	4	5
7. When I'm upset, I become embarrassed for feeling that way	1	2	3	4	5
8. When I'm upset, I have difficulty getting work done	1	2	3	4	5
9. When I'm upset, I become out of control	1	2	3	4	5
10. When I'm upset, I believe that I will end up feeling very depressed	1	2	3	4	5
11. When I'm upset, I have difficulty focusing on other things	1	2	3	4	5
12. When I'm upset, I feel guilty for feeling that way	1	2	3	4	5
13. When I'm upset, I have difficulty concentrating	1	2	3	4	5

14. When I'm upset, I have difficulty controlling my behaviors	1	2	3	4	5
15. When I'm upset, I believe there is nothing I can do to make myself feel better	1	2	3	4	5
16. When I'm upset, I become irritated with myself for feeling that way	1	2	3	4	5
17. When I'm upset, I lose control over my behavior	1	2	3	4	5
18. When I'm upset, it takes me a long time to feel better	1	2	3	4	5

PRFQ

For this questionnaire, please answer in relation to your current foster child. If you are fostering more than one child, please choose the child you have been fostering for the longest.

Listed below are a number of statements concerning you and your child. Read each item and decide whether you agree or disagree and to what extent.

Use the following rating scale, with 7 if you strongly agree; and 1 if you strongly disagree. The midpoint, if you are neutral or undecided, is 4.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree

1. __The only time I'm certain my foster child loves me is when he or she is smiling at me.
2. __I always know what my foster child wants.
3. __I like to think about the reasons behind the way my foster child behaves and feels.
4. __My foster child cries around strangers to embarrass me.
5. __I can completely read my foster child's mind.
6. __I wonder a lot about what my foster child is thinking and feeling.
7. __I find it hard to actively participate in make believe play with my foster child.
8. __I can always predict what my foster child will do.
9. __I am often curious to find out how my foster child feels.
10. __My foster child sometimes gets sick to keep me from doing what I want to do.
11. __I can sometimes misunderstand the reactions of my foster child.
12. __I try to see situations through the eyes of my foster child.
13. __When my foster child is fussy he or she does that just to annoy me.
14. __I always know why I do what I do to my foster child.
15. __I try to understand the reasons why my foster child misbehaves.
16. __Often, my foster child's behaviour is too confusing to bother figuring out.
17. __I always know why my foster child acts the way he or she does.
18. __I believe there is no point in trying to guess what my foster child feels.

Parental Stress Scale

For this questionnaire, please answer in relation to your current foster child. If you are fostering more than one child, please choose the child you have been fostering for the longest.

The following statements describe feelings and perceptions about the experience of being a parent. Think of each of the items in terms of how your relationship with your child or children typically is. Please indicate the degree to which you agree or disagree with the following items by placing the appropriate number in the space provided.

1 = Strongly disagree 2 = Disagree 3 = Undecided 4 = Agree 5 = Strongly agree

1 I am happy in my role as a foster parent

2 There is little or nothing I wouldn't do for my foster child(ren) if it was necessary.

3 Caring for my foster child(ren) sometimes takes more time and energy than I have to give.

4 I sometimes worry whether I am doing enough for my foster child(ren).

5 I feel close to my foster child(ren).

6 I enjoy spending time with my foster child(ren).

7 My foster child(ren) is an important source of affection for me.

8 Having foster child(ren) gives me a more certain and optimistic view for the future.

9 The major source of stress in my life is my foster child(ren).

10 Having foster child(ren) leaves little time and flexibility in my life.

11 Having foster child(ren) has been a financial burden.

12 It is difficult to balance different responsibilities because of my foster child(ren).

13 The behaviour of my foster child(ren) is often embarrassing or stressful to me.

14 If I had it to do over again, I might decide not to have foster child(ren).

15 I feel overwhelmed by the responsibility of being a foster parent.

16 Having foster child(ren) has meant having too few choices and too little control over my life

17 I am satisfied as a foster parent

18 I find my foster child(ren) enjoyable

Appendix H: Participant Debrief

UNIVERSITY OF Southampton

Study title: Interpretations of Foster Children's Emotions and Caregiver Stress
Written Debriefing Statement
Version 5
Date: 05 September 2022
ERGO ID: 71456
IRAS ID: 311104
Researchers: Lexie Thorpe, Dr Katy Sivyer, Dr Kate Willoughby

Thank you for taking part in this study. This study is investigating how foster carers interpret their foster child's feelings and behaviour. The research is also interested in how this understanding might be influenced by the carers' experience of relationships, ways of coping with feelings and the stresses and rewards of being a caregiver.

It is hoped that your data may help our understanding of how these factors influence the experience of fostering, and how to support foster carers in their role.

The results of this study will not include your name or any other way to identify you. The survey did not use deception.

To thank you for taking part, there is an opportunity to enter a prize draw to win one of 16 Amazon vouchers worth up to £25. There are four £25, ten £15 and 12 £10 vouchers to be won. If you would like to enter the draw, or if you wish to receive a summary of the research findings, please follow the link below to provide your email address. This will not be linked to your questionnaire answers.

<<<insert link to separate survey >>>
https://southampton.qualtrics.com/jfe/form/SV_bfPs95PmnI6UFfg

The survey included some topics which may be sensitive. If you have experienced distress whilst taking part, you may want to seek advice from your GP, or use the resources below for advice or support:

Support Services:
Fosterline: 0800 040 7675
Relate: {HYPERLINK "https://www.relate.org.uk/"}
MIND: {HYPERLINK "https://www.mind.org.uk/"}
Samaritans: 08457 90 90 90

Resources:
Moodgym: {HYPERLINK "https://moodgym.com.au/"}
Headspace: {HYPERLINK "https://www.headspace.com/"}

Beating the Blues: {HYPERLINK "http://www.beatingtheblues.co.uk/"}

If your concerns relate to caregiver stress, you may also find it helpful to seek advice from your Supervising Social Worker.

If you have any questions or require any further information after reading this information sheet, please contact the researcher:

Lexie Thorpe, a.h.thorpe@soton.ac.uk

Research Supervisors:
Dr Katy Sivyer, Lecturer in Clinical Psychology {HYPERLINK "mailto:K.A.J.Sivyer@soton.ac.uk"}
Dr Kate Willoughby, Clinical Psychologist {HYPERLINK "mailto:K.Willoughby@soton.ac.uk"}

Thank you for your participation in this research.

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

Appendix I: Recruitment Sources

Type	*N*		
	Confirmed	Declined	No response
NHS/Social Care sites	4	1	25
Independent Fostering Agencies	7	1	36
Support & Information Organisations	6	1	3
Social Media Groups	4	2	5

Appendix J: Supplementary Analyses

StatusComp = Incomplete

Descriptive Statistics[a]

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Age	44	41.00	25.00	66.00	47.5909	1.48399	9.84370	96.899	-.423	.357	-.624	.702
Education	42	3.00	1.00	4.00	2.4286	.13262	.85946	.739	.474	.365	-.384	.717
YearsExperience	39	22.00	.00	22.00	6.6410	.88661	5.53690	30.657	1.092	.378	.543	.741
ChildrenFostered	39	99.00	1.00	100.00	12.7436	2.93559	18.33277	336.090	3.279	.378	13.321	.741
CurrentlyFostering	39	2.00	1.00	3.00	1.6410	.12451	.77755	.605	.740	.378	-.925	.741
ChildAge	39	17.00	.00	17.00	9.2308	.97711	6.10203	37.235	-.083	.378	-1.669	.741
Valid N (listwise)	39											

a. StatusComp = Incomplete

StatusComp = Completer

Descriptive Statistics[a]

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Age	73	45.00	26.00	71.00	48.7397	1.23773	10.57516	111.834	-.336	.281	-.720	.555
Education	73	3.00	1.00	4.00	2.4658	.10875	.92919	.863	.103	.281	-.802	.555
YearsExperience	73	50.00	.00	50.00	8.6986	1.05674	9.02879	81.519	2.038	.281	5.690	.555
ChildrenFostered	73	299.00	1.00	300.00	21.8630	5.45660	46.62120	2173.537	4.485	.281	22.232	.555
CurrentlyFostering	73	4.00	.00	4.00	1.8356	.10507	.89774	.806	.690	.281	-.026	.555
ChildAge	72	147.00	.00	147.00	12.6722	1.97629	16.76937	281.212	7.404	.283	60.003	.559
Valid N (listwise)	72											

a. StatusComp = Completer

StatusComp * Gender Crosstabulation

			Gender		
			Male	Female	Total
StatusComp	Incomplete	Count	4	38	42
		Expected Count	5.5	36.5	42.0
		% within StatusComp	9.5%	90.5%	100.0%
		% within Gender	26.7%	38.0%	36.5%
		% of Total	3.5%	33.0%	36.5%
	Completer	Count	11	62	73
		Expected Count	9.5	63.5	73.0
		% within StatusComp	15.1%	84.9%	100.0%
		% within Gender	73.3%	62.0%	63.5%
		% of Total	9.6%	53.9%	63.5%
Total		Count	15	100	115
		Expected Count	15.0	100.0	115.0
		% within StatusComp	13.0%	87.0%	100.0%
		% within Gender	100.0%	100.0%	100.0%
		% of Total	13.0%	87.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.723[a]	1	.395		
Continuity Correction[b]	.316	1	.574		
Likelihood Ratio	.753	1	.386		
Fisher's Exact Test				.567	.292
Linear-by-Linear Association	.716	1	.397		
N of Valid Cases	115				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.48.

b. Computed only for a 2x2 table

StatusComp * Ethnicity Crosstabulation

			Ethnicity						
			English/Welsh/ Scottish/Northe rn Irish/British	Irish	Other white background	White and Black African	Any other Mixed/Multiple ethnic background, please describe	Indian	Total
StatusComp	Incomplete	Count	40	0	2	0	0	0	42
		Expected Count	39.4	.4	1.1	.4	.4	.4	42.0
		% within StatusComp	95.2%	0.0%	4.8%	0.0%	0.0%	0.0%	100.0%
		% within Ethnicity	37.0%	0.0%	66.7%	0.0%	0.0%	0.0%	36.5%
		% of Total	34.8%	0.0%	1.7%	0.0%	0.0%	0.0%	36.5%
	Completer	Count	68	1	1	1	1	1	73
		Expected Count	68.6	.6	1.9	.6	.6	.6	73.0
		% within StatusComp	93.2%	1.4%	1.4%	1.4%	1.4%	1.4%	100.0%
		% within Ethnicity	63.0%	100.0%	33.3%	100.0%	100.0%	100.0%	63.5%
		% of Total	59.1%	0.9%	0.9%	0.9%	0.9%	0.9%	63.5%
Total		Count	108	1	3	1	1	1	115
		Expected Count	108.0	1.0	3.0	1.0	1.0	1.0	115.0
		% within StatusComp	93.9%	0.9%	2.6%	0.9%	0.9%	0.9%	100.0%
		% within Ethnicity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	93.9%	0.9%	2.6%	0.9%	0.9%	0.9%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.490[a]	5	.625
Likelihood Ratio	4.767	5	.445
Linear-by-Linear Association	.664	1	.415
N of Valid Cases	115		

a. 10 cells (83.3%) have expected count less than 5. The minimum expected count is .37.

StatusComp * StressfulLifeEvents Crosstabulation

			StressfulLifeEvents		
			1.00	2.00	Total
StatusComp	Incomplete	Count	17	22	39
		Expected Count	14.3	24.7	39.0
		% within StatusComp	43.6%	56.4%	100.0%
		% within StressfulLifeEvents	41.5%	31.0%	34.8%
		% of Total	15.2%	19.6%	34.8%
	Completer	Count	24	49	73
		Expected Count	26.7	46.3	73.0
		% within StatusComp	32.9%	67.1%	100.0%
		% within StressfulLifeEvents	58.5%	69.0%	65.2%
		% of Total	21.4%	43.8%	65.2%
Total		Count	41	71	112
		Expected Count	41.0	71.0	112.0
		% within StatusComp	36.6%	63.4%	100.0%
		% within StressfulLifeEvents	100.0%	100.0%	100.0%
		% of Total	36.6%	63.4%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.257[a]	1	.262		
Continuity Correction[b]	.838	1	.360		
Likelihood Ratio	1.246	1	.264		
Fisher's Exact Test				.306	.180
Linear-by-Linear Association	1.246	1	.264		
N of Valid Cases	112				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 14.28.

b. Computed only for a 2x2 table

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Age	Equal variances assumed	.445	.506	-.584	115	.280	.560	-1.14882	1.96729	-5.04564	2.74801
	Equal variances not assumed			-.594	95.914	.277	.554	-1.14882	1.93241	-4.98467	2.68703
Education	Equal variances assumed	.762	.384	-.212	113	.416	.832	-.03718	.17518	-.38424	.30988
	Equal variances not assumed			-.217	91.199	.414	.829	-.03718	.17151	-.37785	.30349
YearsExperience	Equal variances assumed	4.297	.041	-1.297	110	.099	.197	-2.05760	1.58610	-5.20088	1.08567
	Equal variances not assumed			-1.492	107.817	.069	.139	-2.05760	1.37941	-4.79189	.67669
ChildrenFostered	Equal variances assumed	3.313	.071	-1.172	110	.122	.244	-9.11942	7.78044	-24.53842	6.29957
	Equal variances not assumed			-1.472	103.312	.072	.144	-9.11942	6.19614	-21.40757	3.16872
CurrentlyFostering	Equal variances assumed	.063	.802	-1.143	110	.128	.255	-.19459	.17020	-.53189	.14271
	Equal variances not assumed			-1.194	87.875	.118	.236	-.19459	.16292	-.51836	.12918
ChildAge	Equal variances assumed	.008	.929	-1.236	109	.110	.219	-3.44145	2.78460	-8.96044	2.07754
	Equal variances not assumed			-1.561	98.911	.061	.122	-3.44145	2.20464	-7.81599	.93309