Examining factors which impact the emotional and behavioural outcomes of care experienced children and young people

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Chapter 1: Systematic Review

A systematic review examining the impact of placement instability on the mental health outcomes of care experienced children and young people.

Prepared in accordance with the author requirements for the Journal of Child Psychology and Psychiatry (JCPP)*
(Author submission guidelines)

**This chapter has a greater word count than recommended by the JCPP, for the purposes of the thesis examination process.*

Abstract

Background: Care experienced children and young people (CECYP) are at risk of mental health difficulties and often experience placements which are disrupted and unstable. This review aimed to examine the impact of placement instability on the mental health outcomes of CECYP, and secondly to explore how placement instability is measured and characterised in the literature.

Methods: This review was conducted following the PRISMA guidance. Four major databases were searched on 14th December 2023. At each step of the screening, 100% of the papers were screened by the primary author and 10% of the papers were independently reviewed by a second reviewer. Relevant information was extracted using a data extraction table designed for this study. The quality of the included studies was assessed using the Crowe Critical Appraisal Tool (CCAT). The results from all papers included in the review were synthesised using a narrative synthesis approach and results from a subsample of the papers eligible for quantitative synthesis were analysed using a random effects meta-analysis.

Results: Twenty-one studies were eligible for inclusion. Narrative synthesis of the papers found that overall placement instability has a negative impact on mental health outcomes in CECYP, irrespective of age, sex, domain of mental health assessed (internalising and externalising), and initial levels of mental health. Similarly, the meta-analysis found that placement instability has a small significant association with both internalising and externalising mental health difficulties.

Conclusions: Placement instability remains a concerning risk factor for mental health difficulties of CECYP, and efforts should be made to minimise instability for this population.

Keywords: Care experienced children and young people, placement instability, mental health, meta-analysis

Introduction

Children enter the care system for various reasons, however most commonly due to maltreatment (NICE, 2021). Early maltreatment can be a risk factor for the development of mental health difficulties (Lippard & Nemeroff, 2020), and CECYP are three times more likely to have a diagnosis of a mental health disorder than children who have not been in care (Lohr & Jones, 2016). The journey in care for many children is characterised by further instability in placements, causing disruption to relationships and possibly exacerbating mental health difficulties (Woodall et al., 2023). Therefore, it is important to understand the extent to which placement disruptions or moves have an impact on CECYP's mental health.

Maltreatment, care experience, and mental health outcomes

Early childhood adversity, including various types of maltreatment, is associated with both internalising and externalising difficulties (Muniz et al., 2019). Internalising symptoms refer to a range of difficulties that cause psychological distress, such as depression and anxiety (Liu, Chen & Lewis, 2011). Externalising symptoms refer to observable behaviour and difficulties which may lead to interpersonal conflicts, such as aggressive behaviour and hyperactivity (Achenbach, 1966). At least half of those young people in care meet criteria for one or more mental health disorders (including both internalising and externalising disorders), and it has been suggested that these difficulties could be a risk factor for further placement breakdown (Engler et al.,2022).

Impact of placement instability

Children who enter the care system frequently move between placements, with some estimates suggesting that a third of youth in foster care experience three or more placement moves during their time in care (Rubin et al., 2004). Placement instability is defined as 'household and/or institutional moves or placement changes that do not result in a child's permanent placement' (Fisher et al., 2013). A 2019 meta-analysis found that child behavioural difficulties was the strongest predictor of placement instability (Konijn et al., 2019). This is concerning considering placement instability is associated with further disruptions in relationships (Vreeland et al., 2020), low sense of belonging (NICE, 2021), and later criminality (DeGue & Spatz Widom, 2009), all of which can further exacerbate mental health difficulties.

Previous research has suggested that behaviour problems might be both a cause and a consequence of placement instability (Newton, Litrownik & Landsverk, 2000). Although the evidence base on the predictors of placement instability has been extensively studied, effect of placement instability on mental health problems, including both internalising and externalising difficulties requires further consideration (Engler et al., 2022). A recent study by Maguire and colleagues (2024) reviewed quantitative and qualitative studies on the effect of placement instability on emotional and behavioural outcomes of children in foster care, concluding that placement instability has a negative impact on both domains. We are yet to examine and quantify the effect of placement instability on the mental health of CECYP, in any placement type.

The current review

The purpose of this review is to synthesise, quantify, and examine the quality of the quantitative evidence base regarding the impact of placement instability on the mental health outcomes of CECYP. It is hypothesised that CECYP who experience high placement instability will have worse mental health outcomes than those with low instability. The primary question of this review is:

1) How does placement in/stability impact the mental health outcomes of CECYP?

The secondary question of the review is:

2) How is placement in/stability measured in studies examining the impact on mental health outcomes of CECYP?

Methods

Protocol and registration

This review was conducted in line with the updated Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines (see Appendix A, Page et al., 2021). The protocol was registered on PROSPERO on the 2nd of February 2024 (CRD42024444031).

Eligibility Criteria

To be included, studies had to meet the following eligibility criteria.

Inclusion criteria

- English language papers
- Published in peer reviewed journals
- Quantitative observational studies (including cross sectional and longitudinal).
- Population included children aged between 0-18 years.
- All children and young people must have experienced time in care, including any care type (foster, kinship, institutional and adoption).
- Measuring a mental health outcome, using a mental health difficulties outcome scale (total mental health difficulties or internalising or externalising mental health difficulties).
- Measuring the effect of placement instability (the exposure) on the above outcome.

Exclusion criteria

- Dissertation abstracts or papers published in non-peer-reviewed journals
- Papers written in non-English languages
- Randomised controlled trials (RCTs) or non-observational designs
- Papers that measure the effect of mental health difficulties as the exposure on placement instability as the outcome

Search

Search strategy was developed in consultation with an NHS and University of Glasgow librarian. Studies were identified through searches of four major electronic databases: PsycINFO, Embase, Medline and ProQuest. Searches were conducted on 14th December 2023 and the period of time reviewed was from 1806 up until 14th December 2023. A search was undertaken, with the following key words: (foster family or care or parent* or carer* or home or child* or youth or young) or (kinship care or relative care or out-of-home-care or out of home care or looked after or looked-after) and (placement* instability or stability or move* or change* or number*).

Study selection

Duplicates were removed using the automatic function on EndNote and additionally reviewed by hand. The primary researcher screened 100% of titles and abstracts, using the inclusion and exclusion criteria. A second researcher, trainee clinical psychologist, screened

10% of titles and abstracts to assess for inter-rater agreement, and found an 97% agreement. Discrepancies between reviewers were resolved by discussion and consensus. Using eligibility criteria, full text screening was completed for the remaining papers, with 100% of the full text papers screened by the primary author. The second reviewer screened 10% of the full text papers to assess for inter-rater agreement and found an 100% agreement. Reason for exclusion at this stage was recorded. Following this, reference lists in recent and relevant reviews on the topic were hand searched for relevant papers (Maguire et al., 2024, Engler et al., 2022; Konijn et al., 2019).

Data extraction and coding of study characteristics

A data extraction table was created for this study. The following information was extracted from the included papers:

a) Key study characteristics: author, publication year of study, country where study was conducted, study design.
b) Sample characteristics: total sample size, child age, sex.
c) Exposure: measure of placement instability or moves, and how these were measured as well as the time frame in which placement moves were measured.
d) Mental health outcomes: name of mental health measure used and scoring (e.g., continuous score or binary clinical cutoff).
e) Analysis and effect: number of subjects in the analysis, statistic and effect size, p value, standard error, confidence interval and covariates where reported.

Quality of individual studies and risk of bias

Study quality was assessed using the Crowe Critical Appraisal Tool (CCAT) (Crowe, 2013). The CCAT form is divided into eight categories (preliminaries, introduction, design, sampling, data collection, ethical matters, results and discussion) with 22 items. Each category receives its own score on a six-point scale from 0-5, with zero indicating the lowest score and five indicating the highest score, half marks are not allowed. The total score given to a paper is the sum of all the categories, and this can be expressed as a percentage. The total % CCAT quality scores are classified as:< 20 (50%) poor quality; 20-30 (50-75%) moderate quality and 30+ (75% +) high-quality (Crowe, 2013). A second rater completed 10% of the critical appraisal using CCAT and inter-rater agreement was calculated, with an 100% agreement on ratings of

the overall quality of the studies, and no more than a one-point difference in ratings across all categories. These were conferenced and a consensus was reached.

Synthesis

To examine how placement instability or moves are measured, a descriptive approach was used. To assess the effect of placement instability on mental health outcomes (primary research question), initially a narrative synthesis was utilised to integrate and summarise findings across all included studies. Three elements from the general framework of a narrative synthesis were used to explore the results of the studies: developing preliminary synthesis, exploring relationships within and between studies, and assessing the quality of the studies included (Popay et al., 2006).

A meta-analysis was also conducted with a subset of eligible studies. The R package metafor (Viechtbauer, 2010) was used to conduct a meta-analysis of correlations in RStudio (R version 4.33, R Core Team, 2024). The effect size of each study was extracted and recorded individually. An online effect size converter was used to convert odds ratio and standardised regression coefficients to r (Lenhard & Lenhard, 2022). Effect sizes were documented for internalising, externalising, and total difficulties separately. Where various effect sizes within a domain were reported, or when multiple effects were reported for the same domain using multiple informants, an average was taken (see Appendix B, Supplementary Methods for detail). When longitudinal data reported on multiple follow ups, the effect of the exposure on the outcome at the latest follow up was included. A random- effects model was used with a restricted maximum-likelihood estimator, as it allows for heterogeneity of data and parameters across studies (Vevea & Coburn, 2015). Initially, using metafor, the individual correlation coefficients were transformed using Fisher's z transformation to undertake the meta-analysis. Those effects were then transformed back to r correlations to aid with interpretation. The correlations and combined correlation along with their 95% confidence interval are visualised using a forest plot. Cohen's criteria (Cohen, 1988) for small (r=.10–.29), medium (r=.30–.49) and large (r≥.50) effect sizes were used to evaluate the magnitude of the effect sizes. Heterogeneity among studies was analysed using the Cochrane's Q test (significant heterogeneity was determined at $p < .05$). The I^2 was also used to characterise heterogeneity as small = 25%, moderate = 50%, and large = 75% (Higgins et al., 2003). If

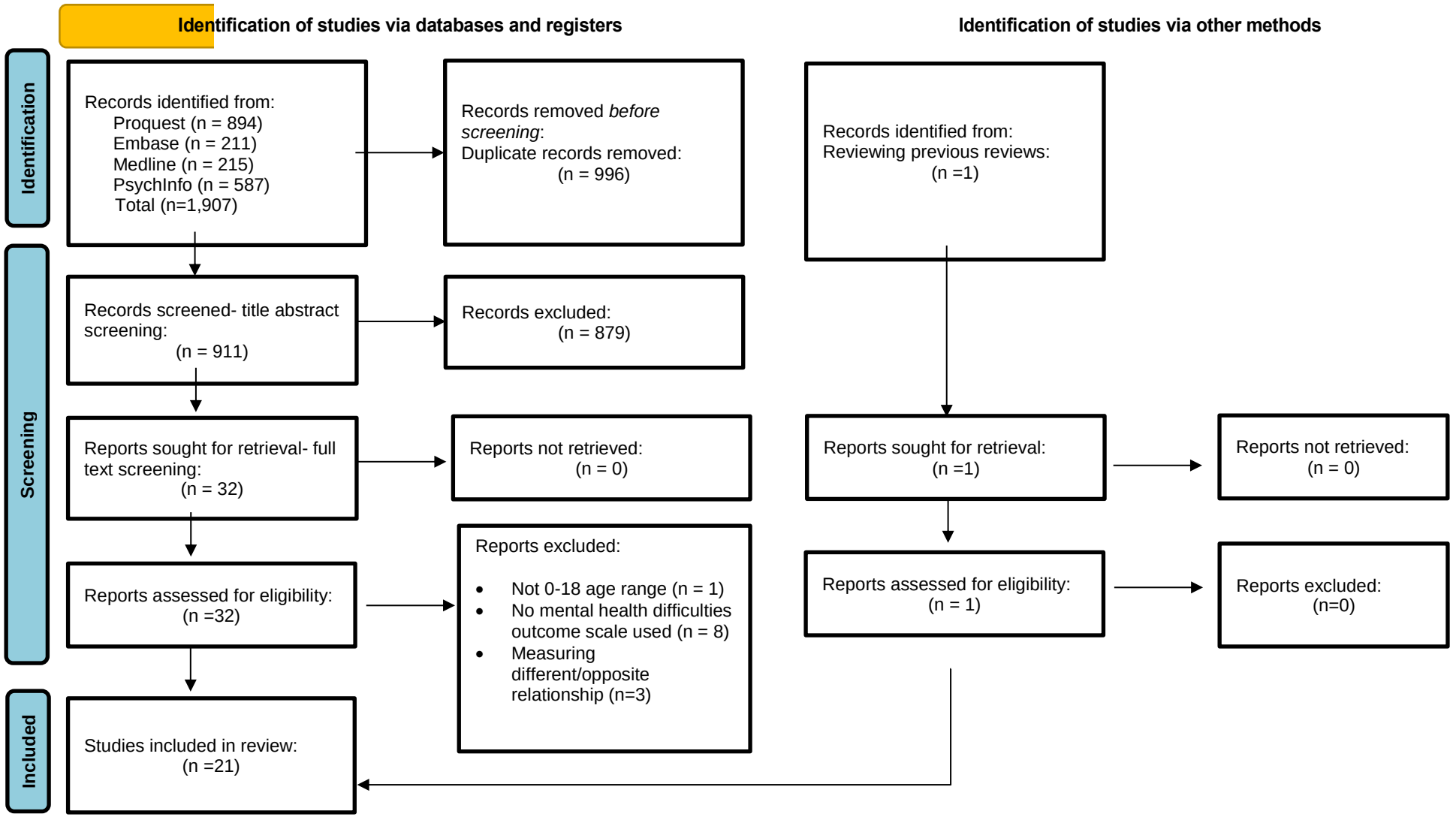
heterogeneity was large, influential cases were determined using a Baujat plot and influential diagnostic tests (Baujat et al., 2002).

Results

The searches were completed on 14th December 2023. As shown in Figure 1, a total of 1,907 papers were identified. Following de-duplication, 911 unique references were screened at the title and abstract stage, followed by 32 full texts screened. One study was identified from reviewing recent reviews. A total of 21 studies met eligibility criteria and were included in the review.

Figure 1

PRISMA Flow Diagram (adapted from Page et al., 2021)



Study characteristics

Table 1 illustrates key information extracted from the included studies. The included 21 studies were published between 1988 and 2024: 11 were conducted within the United States, three in the United Kingdom, three in Australia, one in France, one in Belgium, one in The Netherlands and one in Jordan. Fourteen were a prospective cohort design and seven were cross sectional. The total number of participants across the 21 studies was 16,973 with an age range of 0-18 years. Out of the 21 studies included in the review, 18 studies measure mental health difficulties by including at least one carer or parent rated report using standardised measures such as Child Behaviour Checklist (CBCL; Achenbach, 2001). One study only uses teacher report (Dumaret, 1988), one study uses reports from social workers (Barber & Delfabbro, 2003), and one study uses self-report (Mishra et al., 2020).

Table 1

Study Characteristics and Placement Operationalisation

Author	Year	Region	Study Design	N	Age range	MH measure	How placement instability was measured	How placement instability was defined	Time frame instability was measured
Aarons et al.,	2010	USA	Prospective cohort study	422	2-15	CBCL	**Count** (number of moves between waves of the study; between wave 1-3 and wave 3-4)	The child's physical location of residence had to change	3 years
Asif et al.,	2024	Australia	Prospective cohort study	4126	0-15	1)CBCL 2) BITSEA Combined to create a total socio-emotional difficulties score	**Count** Measured as the distinct number of placement changes per 1000 care days	Number of distinct placement moves (to a different carer)	2.7 years
Barber and Delfabbro	2003	Australia	Prospective cohort study	235	4-17	CBCL	**Coded into groups (3)** 1) Stable (same placement) 2) Unstable (moved placement within both follow up periods) 3) Unstable-stable-(changed placements between Baseline-T2	Any change in placement	8 months

							but achieved a stable foster placement during T2-T3)		
Beck	2006	UK	Cross sectional	786	3-18	SDQ	**Count**	No further details provided	1 year
Dumaret	1988	France	Cross sectional	157	7-15	Rutter B scale	**Coded into groups (3)** 1) 1 previous placement 2) 2 previous placements 3) 3 or more previous placements	Number of placements prior to admission to the children's village	Lifetime
Hiller et al.,	2023	UK	Prospective cohort study	672	2-16	SDQ	**Count**	Total number of placement providers over the first 3 years in care	3 years
Hiller and Clair	2018	UK	Prospective cohort study	217	4-18	SDQ	**Count**	The total number of individual placement providers over the first five years in care (any length of placement (including respite care or temporary placements).	5 years
Hussey and Guo	2005	USA	Cross sectional	119	4-18	Devereux Scales of Mental Disorders (DSMD)	**Count**	Previous out of home placements prior to their current admission	Lifetime
Lewis et al.,	2007	USA	Cross sectional	102	5-6	CBCL	**Count**	Any placement with a new caregiver was counted as one placement.	Lifetime

Linares et al.,	2010	USA	Prospective cohort study	252	3-<12	Parent report: The Computer-Based Diagnostic Interview Schedule for Children (CDISC4) Teacher report: Sutter Eyberg Student Behaviour Inventory-Revised	**Count** Time-varying moves indicated the number of moves at each wave (0 – 7). Average moves coded as time invariant indicated the mean sum of moves across waves (0 –7).	Number of foster home changes	4 years
MacKenzie et al.,	2014	Jordan	Cross sectional	134	1.5-12	CBCL	**Count**	Based on policy the care centres moved children at different time points. This was used to calculate approximate change clocks.	Lifetime
Mishra et al.,	2020	USA	Prospective cohort study	1657	9-17	Youth Self Report (YSR).	**Coded into groups (6)** *OOHP – out of home placement* 1) "OOH three times" 2) "OOHP three times with one or more change in placement 3) "OOHP two times" 4) "OOHP two times with change in placement" 5) "OOHP one time"; and	Any change in out of home placement	3 years

							6) "no OOHP"		
Newton et al.,	2000	USA	Prospective cohort study	415	0-17	CBCL	**Count**	Every change in placement during the first 18 months after entry to care	1.5 years
Proctor et al.,	2010	USA	Prospective cohort study	279	6-14	CBCL	**Coded into groups (2)** 1) 1 (same caregiver since previous interview) 2) 0 (different caregiver since previous interview) Then used to create a continuous measure across all 5 time points ranging from (child was never living with the same primary caregiver) to 5 (child was living with the same primary caregiver across all 5 time points).	Caregiver stability rather than placement move, coded at each time point of the study.	8 years
Rosenthal and Villegas	2010	USA	Prospective cohort study	4080	0-16	CBCL	**Coded into groups (3)** 1) 0 (0 changes) 2) 1 (1 change) 3) 2 (2 or more changes)	Include move to foster homes (kin and non-kin), group homes, residential treatment, and other placement settings.	8 years
Rubin et al.,	2008	USA	Perspective cohort study	1309	0-15	CBCL	**Coded into groups (3)** 1) Early stable (children who achieved a long-	No additional information provided.	3 years

							lasting placement within 45 days of entry into out-of-home care, which was maintained for the study period) 2) Late stable (achieved a long-lasting placement, but only after 45 days, with a duration of at least half of the study period) 3) Unstable (children failed to achieve a long- lasting placement during study period)		
Rubin et al.,	2007	USA	Perspective cohort study	729	0-15	1)CBCL 2)Temperament scores Combined to create total behaviour problems	**Coded into groups (3)** (same as above, Rubin et al, 2008).	No additional information provided.	3 years
Strijker et al.,	2008	Netherlands	Prospective cohort study	419	0-18	Behaviour problems questionnaire	**Count**	Current foster family placements are not included in establishing the placement history. A movement is described in this study as each transfer of a child to another placement without his parents.	1.5 years
Tarren-Sweeney	2008	Australia	Cross sectional	347	4-11	CBCL	**Count**	The number of placements, excluding placements of less than	Since entry into care

								1 week in duration as well as temporary care events that pre-date their present entry to care.	
Vanschoonlandt et al.,	2012	Belgium	Cross sectional	186	3-18	CBCL	**Count**	Number of previous out of home placements	Lifetime
Villodas et al.,	2016	USA	Prospective cohort study	330	4-12	Caregiver report-CBCL Youth self-report YSR	**Count**	Number of placements during the first 18 months in care (i.e., before permanent placement).	1.5 years

Quality assessment

Table 2 provides a summary of the quality appraisal of the studies. Of the 21 included studies, seven were rated as high quality, 13 studies were rated as moderate quality, one study was rated as poor quality, which was also the oldest paper (Dumaret, 1988) and may have followed different reporting guidance. All were considered eligible for inclusion in the descriptive and narrative synthesis.

Overall, the introduction and discussion sections of the papers in this review were of good quality, with clear aims and rationale for their research and practical implications of the research appropriately highlighted. Most studies administered widely used outcome measures to assess mental health and behavioural outcomes, with good reliability and validity (e.g. CBCL; SDQ). Nonetheless, there were some methodological limitations present. Most studies did not explicitly state the design of the study, or the justification for choosing that design or sampling method. None of the studies reported completing a-priori sample size calculations to establish the necessary sample size for their analysis. Eight of the studies made no reference to ethical considerations (Barber & Delfabbro, 2003; Dumaret, 1988; Hussey & Guo, 2005; Lewis et al., 2007; Newton et al., 2000; Rosenthal & Villegas, 2010; Strijker, Knorth & Knot-Dickscheit, 2008 & Vanschoonlandt et al., 2012) and a further five studies made no mention to ethical approval (Asif, Breen & Wells, 2024; Beck, 2006; Linares et al., 2010; Villodas et al., 2016; Tarren-Sweeney, 2008).

Table 2

Quality Appraisal of Studies Using the CCAT (Crowe, 2013)

Author	Year	Preliminaries	Introduction	Design	Sampling	Data collection	Ethical matters	Results	Discussion	Total score /40	Total % score	Quality rating
Aarons et al.,	2010	4	5	3	4	3	3	4	5	31	78%	High
Asif et al.,	2024	4	5	3	3	3	1	4	4	27	68%	Moderate
Barber and Delfabbro	2003	4	4	2	3	4	0	4	3	24	60%	Moderate
Beck	2006	3	2	1	3	3	2	2	4	20	50%	Moderate
Dumaret	1988	2	2	2	3	2	0	3	3	17	43%	Poor
Hiller et al.,	2023	4	5	4	4	4	4	4	5	34	85%	High
Hiller and Clair	2018	4	3	3	4	4	4	4	4	30	75%	Moderate
Hussey and Guo	2005	3	4	3	3	3	0	4	4	24	60%	Moderate
Lewis et al.,	2007	4	5	3	3	4	0	4	4	28	70%	Moderate
Linares et al.,	2010	4	3	4	4	4	1	4	4	28	70%	Moderate

MacKenzie et al.,	2014	4	4	4	4	4	5	4	4	33	83%	High
Mishra et al.,	2020	4	4	4	4	4	4	4	4	32	80%	High
Newton et al.,	2000	4	4	4	4	4	0	4	5	29	73%	Moderate
Proctor et al.,	2010	4	4	4	4	4	3	4	4	31	78%	High
Rosenthal and Villegas	2010	4	5	4	4	4	0	4	5	30	75%	Moderate
Rubin et al.,	2008	4	3	4	4	3	3	4	4	30	75%	Moderate
Rubin et al.,	2007	4	4	4	4	4	2	4	4	30	75%	Moderate
Strijker et al.,	2008	4	4	4	3	4	0	4	3	27	68%	Moderate
Tarren-Sweeney	2008	5	4	4	4	3	2	4	5	31	78%	High
Vanschoonlandt et al.,	2012	4	4	3	3	4	0	3	4	25	63%	Moderate
Villodas et al.,	2016	5	5	4	4	4	3	4	4	32	80%	High

Measurement of placement instability or moves

As you can see from Table 1, 13 studies measured placement instability by counting and reporting on number of moves and eight studies created groups to represent instability in placement. Grouping approaches varied, including labelling groups as stable or unstable (and variations of this) (Barber & Delfabbro, 2003; Rubin et al., 2007; Rubin et al., 2008) or using numbers to code variations in instability (e.g. 0= no changes, 1= 1 change, 2= 2 or more changes) (Dumaret, 1988; Rosenthal & Villegas, 2010).

The time frames in which studies calculated the number of placement moves also vary. Fifteen studies measured placement moves during their specific study period, which ranged from eight months to eight years. One study measured the number of moves since entry to foster care (Tarren-Sweeney, 2008) and five studies do not explicitly state the time frames and infer lifetime instability (Dumaret, 1988; Hussey & Guo, 2005; Lewis et al., 2007; MacKenzie et al., 2014; Vanchoonlandt et al., 2012).

Impact of placement in/stability on mental health outcomes

Table 3 provides an overview of the main findings of each study and including the sizes of the effect of placement instability on mental health outcomes (internalising and externalising). Further details of the statistics from each study are provided in Appendix C. From reviewing the papers, the results were grouped and narratively synthesised based on mental health domain (total mental health difficulties, internalising or externalising). Where appropriate, these results were further explicated based on whether the analysis was adjusted or unadjusted for covariates, and how the outcome was measured (continuous or clinical cutoffs). All studies were rated of moderate to high in quality and included in the syntheses, except for one older study (Dumaret, 1988) that was rated as poor. This study was only included in the narrative synthesis (see Table 3).

Table 3

Main Findings of the Studies (and associated effect sizes)

Author	Year	n (=number included in the analysis)	Mental health domain (cut offs for grouping or continuous score)	Main finding	Adjusted or unadjusted
Aarons et al.,	2010	422	Internalising and externalising (continuous score)	Placement changes between Waves 1-3 (baseline to 18 months) predicted more externalising behaviour problems at Wave 3 (β =.147, p <.01) but not internalising problems (β =.147, p >.05). Placement changes between Waves 3-4 (18 months- 36 months did not significantly predict either externalising or internalising difficulties behaviour problems at Wave 4 (β =.045, p >.05, β =.093, p >.05).	Adjusted
Asif et al., *	2024	3156	Internalising (cut off)	Placement stability (whilst controlling for covariates) had a significant association with socio-emotional development The probability of being in the typical range decreases over time as the number of placements increases.	Adjusted
Barber and Delfabbro*	2003	120	Externalising and Internalising (conduct, hyperactivity and emotionality) (continuous score)	Children in the stable placement group had a linear improvement in behaviour. Children in the unstable group displayed improvements (except in hyperactivity). Children in the unstable-stable group only showed improvement when their placement was unstable.	Adjusted
Beck *	2006	109	Internalising and externalising (conduct, hyperacuity and emotionality) (cut off)	Young people who move placement frequently were three times more likely than others to have any psychiatric diagnosis and to have a 'probable' conduct disorder. The numbers were too small to compare hyperactivity and emotional disorders.	Adjusted

Dumaret *	1988	92	Externalising (continuous score)	The greater the number of placements experienced by the child led to a higher average score on the measure of behaviour problems.	Unadjusted
Hiller et al.,	2023	460	internalising and externalising (conduct and hyperactivity) (cut offs)	Higher number of placement moves over the first three years in care predicted the higher likelihood of children and young people being in the chronic (or delayed) trajectory group (conduct OR= 1.38, 95% CI=1.18,1.60), hyperactivity (OR=1.14, 95% CI= 1.01,1.28), emotional (OR=1.17, 95% CI= 1.04, 1.32) as compared to the resilient group.	Adjusted
Hiller and Clair	2018	207	internalising and externalising (conduct and hyperactivity) at latest follow up (Year 5) (cut offs)	Main bivariate associations between placement moves and SDQ scores at latest follow up (year 5) suggest a positive association: for emotional problems (r=0.23, p<.05); for externalising difficulties these were separated across SDQ subscales for peer (r=0.30, p<.05), conduct (r=0.37, p<.01) and hyperactivity (r=0.22, p<.01). In addition, higher placement moves were associated with higher likelihood with being in the chronic trajectory on all subscales – chronic trajectories in terms of emotional and behavioural symptoms rated as abnormal initially and remaining the same throughout.	Unadjusted
Hussey and Guo*	2005	97	Internalising, externalising and total problem (continuous score)	The number of previous out of home placements was positively associated with increased levels of psychiatric symptomatology across internalising difficulties (B= 1.12, p<.05), externalising difficulties (B=1.12, p<.01) and total difficulties (B=1.10, p<.01).	Adjusted
Lewis et al.,	2007	102	Internalising, externalising and total problem (continuous score)	Placement instability was positively associated with externalising behavioural difficulties (r= .28, p<.05) and total difficulties (r=.21, p<.01). No significant associations were found between placement instability and internalising difficulties (r=-.01, p=not reported). They also found that children who had experience placement instability were also rated as more oppositional than other children on the Child Behaviour Checklist (CBCL).	Unadjusted
Linares et al.,	2010	252	Externalising (inattention, hyperactivity) (continuous score)	Higher foster parent reports of hyperactivity were associated with higher number of foster home moves (β =.23, p =.043). No significant associations were found between number of placements and foster parent reports of symptoms of inattention (β =.007, p =0.578). Similarly, no effects were found for the birth parents reports of inattention or hyperactivity (β =.15, p =.0169; β =.00, p =.937) or teacher reports of inattention or hyperactivity (β =-.06, p =.729; β =.14, p =.364).	Adjusted

MacKenzie et al.,	2014	116	Internalising and externalising (continuous score)	Internalising difficulties were associated with stability in placement, as they decreased with time in placement (r= −.31, p<.001). However, externalising behavioural difficulties were not associated with stability (r = −.01, not reported).	Unadjusted
Mishra et al.,	2020	1657	Internalising and externalising (delinquency and aggression) (continuous score)	The higher number of placement changes were associated with negative outcomes for both internalising difficulties (B= 2.45, β = 0.10, p<.001) and externalising difficulties, across both delinquency (B=1.23, β = 0.09, p=.002) and aggression (B=2.19, β = 0.07, p=.021).	Adjusted
Newton et al.,	2000	415	Internalising, externalising and total problem (continuous score)	Children who are exposed to higher number of placement changes are at greater risk of developing emotional and behavioural difficulties, for internalising (β =.125, p <.01), externalising (β =.122, p <.01) and total difficulties (β = .101, p<.01).	Adjusted
Proctor et al.,	2010	279	Internalising and externalising (cut offs)	Stable positive adjustment in internalising (OR= 1.44, p<.01) and externalising symptoms (OR= 1.47, p<.05) was associated with carer stability. Those on increasing adjustment profiles (children who experienced high levels of initial behaviour difficulty but steep increase in positive adjustment at age 6) were not significantly associated with carer stability for internalising (OR=1.57, p= not available) and externalising (OR=1.32, p= not available).	Adjusted
Rosenthal and Villegas	2010	4080	Internalising and externalising (continuous score)	Placement change predicted internalising behavioural difficulties across 8 years (wave 1 to wave 3= (β =.094, p<0.05), wave 3 to wave 4 (β = .117, p<0.05) however not for the final wave (4 to wave 5) (β = .092, p= not available). They found no significant effect of placement change on externalising behaviours across all waves of the study, wave 1 to wave 3 (β = .061, p= not available) wave 3 to wave 4 (β = .001, p= not available) wave 4 to wave 5 (β = .067, p= not available)	Adjusted
Rubin et al.,*	2008	1309	Total problems (cut offs)	Children with unstable placement histories had a 49% probability of total mental health difficulties, compared to 32% probability if children had early stability in placements. They	Adjusted

				also found that children in kinship care were less likely to have unstable placements and were at a lower risk of difficulties at baseline.	
Rubin et al.,	2007	671	Externalising (cut offs)	Children in unstable placements were more likely to have behaviour problems than children who achieved early stability (OR=1.99). Children in foster care experience placement instability unrelated to their baseline problems, and this instability has a significant impact on their behavioural well-being.	Adjusted
Strijker et al.,	2008	410	Externalising (continuous score)	Significant associations were found between the number of placements and severity of behavioural problems at baseline (*r*= .23, p=.0005) and at 1.5 years into placement (*r* .24,p=.0005).	Unadjusted
Tarren-Sweeney*	2008	347	Total problems (continuous score)	Placement instability was a significant predictor of total mental health difficulties, only when age of the child and age of removal from birth family were included in the model.	Adjusted
Vanschoonlandt et al.,	2012	186	Internalising, externalising and total problem (cut offs)	Number of previous placements predicted difficulties across both internalising (OR= 1.42, p=.01) externalising (OR= 1.29 p=.04) and total problems (OR = 1.34 p=.02). They found placement stability to be more important in predicting outcomes than type of placement (e.g. foster care or kinship care).	Unadjusted
Villodas et al.,	2016	330	Internalising and externalising (cut offs)	Children in unstable placement trajectories had significantly poorer behavioural wellbeing than children in stable trajectories. For externalising difficulties this was found for both caregiver report (OR = 4.71, p = .004) and for youth self-report (OR = 5.15, p = .04) and also when compared to stable reunified placements (OR = 6.28, p = .03). No significant associations were found for caregiver report of internalising difficulties (no statistics reported) but they were for youth self-report when comparing to stable placements (OR = 6.73, p = .02) and stable reunified placements reunified (OR = 7.47, p = .02)	Adjusted

Note * indicates studies not included in the meta-analysis. Reasons for exclusion; not reporting on type statistical analysis used (Beck, 2006; Dumaret, 1988, Rubin et al., 2008), type of effect size could not be transformed (Asif et al., 2024; Barber and Delfabbro, 2003), standardised effect size could not be calculated (Hussey and Guo, 2005), only reported effect size for total difficulties (Tarren-Sweeney, 2008).

For a subset of these studies (see Table 3), a meta-analysis was conducted. To calculate the overall effect of placement instability on mental health outcomes two random effect meta-analyses were conducted, one with externalising difficulties (k = 14) as the outcome and another with internalising difficulties (k = 11) as the outcome. After the initial analysis was conducted in both the externalising and internalising models, both models presented with very high heterogeneity (I^2 above 80%). Based on influential case diagnostics, one study (Villodas et al., 2016) was deemed an influential case. As such the models were re-run without this influential study. The results of the meta-analysis before the influential study was removed can be found in Appendices D and E (overall conclusions remained the same). The final meta-analyses included 13 papers for externalising difficulties and 10 for internalising difficulties reported on below.

Total mental health difficulties

Only six papers included in the review examined total mental health difficulties, with significant effects of instability on difficulties noted in all six studies (Vanschoonlandt et al., 2012; Newton et al., 2000; Lewis et al., 2007; Hussey & Guo, 2005; Tarren-Sweeney, 2008; Rubin et al., 2008). One of these papers was not eligible for the meta-analysis (Hussey & Guo, 2005), four papers also report on internalising and externalising difficulties separately, therefore a meta-analysis on total difficulties was not conducted as the effects of these studies would be captured in internalising and externalising difficulties analyses. Tarren-Sweeney (2008) is the only paper which only reports total mental health difficulties, and therefore was not included the meta-analysis.

Externalising difficulties

Narrative synthesis

Overall, 18 studies examined the effect of placement instability on externalising outcomes.

Adjusted

Twelve studies were adjusted for covariates, nine of which found a significant effect of placement instability on externalising difficulties (Aarons et al., 2010; Hiller et al., 2023; Hussey & Guo, 2005; Linares et al., 2010; Mishra et al., 2020; Newton et al., 2000; Proctor et

al., 2010; Rubin et al., 2007; Villodas et al., 2016). Four of these studies found an effect when adjusting for child's initial levels of mental health (Aarons et al., 2010; Newton et al., 2000; Rubin et al., 2007; Villodas et al., 2016), six controlled for child age and sex (Beck, 2006; Linares et al., 2010; Mishra et al., 2020; Newton et al., 2000; Rubin et al., 2007; Hussey & Guo, 2005), and one controlled for child age (Hiller et al., 2023). This suggests that the effect of placement instability on externalising difficulties was found across different age groups as well as sex, and while controlling for initial levels of difficulties in some of the studies.

One study found no significant effect (Rosenthal & Villegas, 2010), and the effect in this study was adjusted for initial mental health difficulties and age. Beck (2006) did not report on significance testing but found that young people who move placement frequently were more likely to have a psychiatric diagnosis. Barber and Delfabbro (2003) found improvements in externalising difficulties (except for hyperactivity), for children in stable placement profiles but also found improvements for children and unstable placement profiles.

Unadjusted

The remaining six studies were unadjusted. Five of these studies found a significant effect of placement instability on mental health outcomes (Hiller & Clair, 2018; Dumaret, 1988; Lewis et al., 2007; Strijker et al., 2008, Vanschoonlandt et al., 2012) whereas MacKenzie et al (2014), did not find a significant association, which was also the only study to measure placement instability by using time since last move.

How outcome measure was coded

Eleven studies measured externalising difficulties on a continuous scale, two of which did not find a significant effect (Rosenthal & Villegas, 2010; MacKenzie et al., 2014). Six measured externalising difficulties using clinical cutoffs, all of which found significant effects.

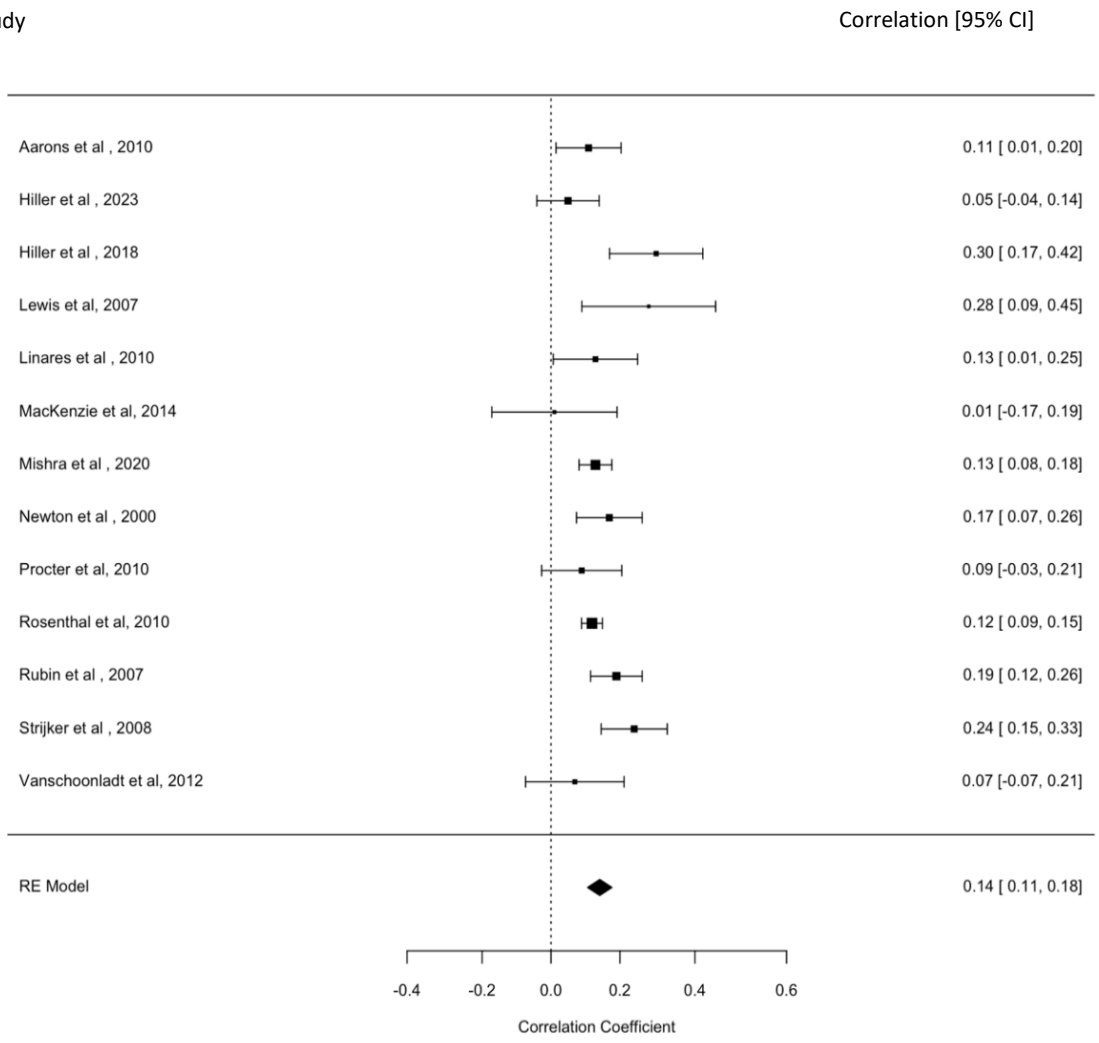
Meta-analysis

A total of 13 studies were included in the meta-analysis, with a total of 9257 participants. The degree of heterogeneity in the meta-analysis was calculated using a restricted maximum-likelihood estimator. The I^2 found a 51.51% heterogeneity across studies and the Cochranes Q was significant (p=0.02), suggesting moderate heterogeneity across studies. To assess for publication bias, the funnel plot was visually examined and looked approximately symmetrical, suggesting no evidence of publication bias (funnel plot in Appendix F). Egger's regression and the Rank correlation test were also examined. Neither of these tests were statistically significant suggesting no evidence of publication bias. Effect sizes

in the studies ranged from *r* = -0.01 (MacKenzie et al., 2014) to *r* = 0.31 (Hiller et al., 2018). The meta-analytical results for the association between placement instability and externalising difficulties revealed a combined correlation of *r* = 0.14, 95% CI = .11, .18, which represents a small but significant effect ($p < 0.001$). This is visualised in the Forest plot below (Figure 2).

Figure 2

Forest Plot for the Random Effects Meta-Analysis of Externalising Difficulties.



Internalising difficulties

Narrative synthesis

Overall, 15 studies examined the effect of placement instability on internalising outcomes.

Adjusted

Eleven studies were adjusted for covariates, eight of which found a significant effect of placement instability on internalising difficulties (Asif et al., 2024; Beck, 2006; Hiller et al., 2023; Hussey & Guo, 2005; Mishra et al., 2020; Newton et al., 2000; Proctor et al., 2010; Rosenthal & Villegas, 2010), two of which had controlled for initial levels of mental health (Rosenthal & Villegas., 2010; Newton et al., 2000). Of the eight studies, four adjusted for child age and sex (Beck, 2006; Mishra et al., 2020; Newton et al., 2000; Hussey & Guo., 2005), two adjusted for child age only (Hiller et al., 2023; Rosenthal & Villegas, 2010) and one study adjusted for sex only (Asif et al., 2024). This suggests that the effect of placement instability on internalising difficulties was present irrespective of age or sex.

Villodas et al (2016) found that placement instability was only significantly associated with youth self-report but not carer report. Barber and Delfabbro (2003) found that children in stable placement profiles showed a steady trend towards improvement in internalising difficulties, however, they also found that children in unstable placement profiles also showed an improvement. One study found no significant effect of placement instability on internalising mental health difficulties (Aarons et al., 2010), and this study had adjusted for initial mental health.

Unadjusted

Four studies were unadjusted, three of which found a significant effect (Hiller & Clair, 2018; MacKenzie et al., 2014; Vanschoonlandt et al., 2012) whereas Lewis et al (2007) did not find a significant association.

How outcome measure was coded

Eight studies measured internalising difficulties using a continuous scale score, two of which did not find significant effects (Aarons et al., 2010; Lewis et al., 2007). Seven studies used clinical cut offs, all finding significant effects.

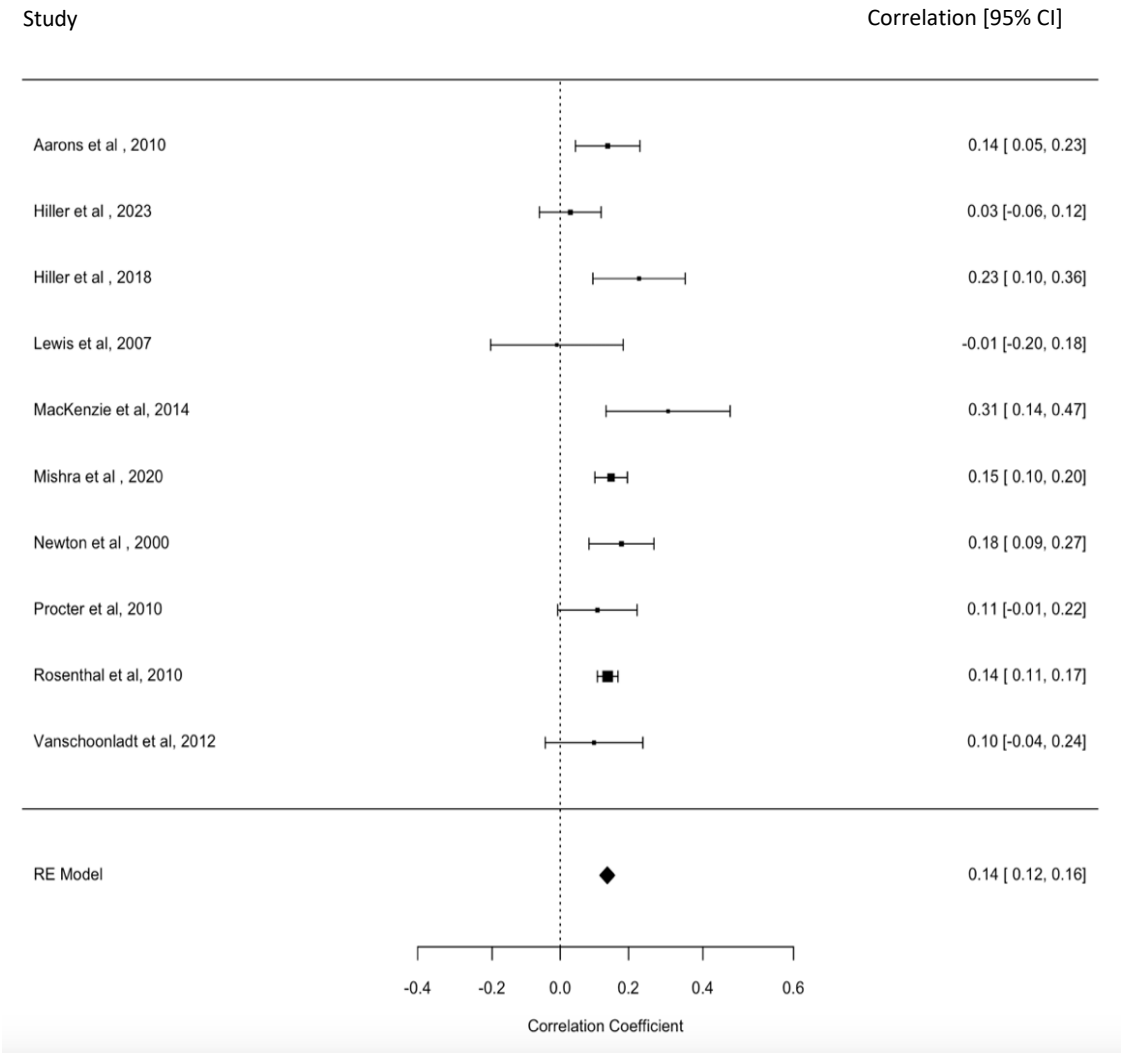
Meta-analysis

A total of 10 studies were included in the meta-analysis**,** including 7924 participants. The I^2 found a 34% heterogeneity across studies and the Cochrane's Q was not significant (p=0.09), suggesting low heterogeneity across studies. To assess for publication bias, the funnel plot was visually examined and looked approximately symmetrical, suggesting no

evidence of publication bias (funnel plot in Appendix G). Egger's regression and the Rank correlation test were also not statistically significant suggesting no evidence of publication bias. Effect sizes in the studies ranged from r = -0.01 (Lewis et al., 2007) to r = 0.31 (MacKenzie et al., 2014). The meta-analytical results for the association between placement instability and internalising difficulties revealed a combined correlation of r = 0.14, 95% CI = .12, .16, which represents a small but significant effect (p < 0.001). This is visualised in the Forest plot below (Figure 3).

Figure 3

Forest Plot for the Random Effects Meta-Analysis for Internalising Difficulties



Discussion

The purpose of this review was to explore the impact of placement instability on the mental health outcomes of CECYP. Although studies varied in how they measured placement instability, most of them utilised standardised measures of mental health difficulties. Overall, this review finds that based on both a narrative synthesis of the findings from all studies and a meta-analysis on a subset of the studies, there is a robust small but significant association between placement instability and both internalising and externalising difficulties. This is the first study to provide a quantitative summary of this effect, which was found to be in some cases independent of the child's initial levels of mental health and in many cases independent of the child's age and sex. The overall effect size found was small. Nonetheless we still consider this to be a meaningful finding, as most studies controlled for important covariates. More importantly, CECYP are a highly vulnerable population group and it is important to consider all factors which may be further negatively impacting their mental health.

Despite the heterogeneity in how placement instability is defined and measured, this study offers strong evidence supporting the finding that greater placement instability is significantly associated with worse mental health outcomes, across samples with a wide age range from early childhood to late adolescence, which is consistent with conclusions from a recent mixed-method review on the behavioural and emotional outcomes of children in foster care (Maguire et al., 2024). This provides further evidence, that frequent moves between various types of care placements has a negative impact on CECYP. Services should aim to provide stable placements, allowing CECYP to develop a sense of permanency in both their physical environment and also with their caregivers, in order to protect and promote their overall wellbeing (Lockwood et al, 2015) and prevent mental health difficulties.

It is important to consider these findings in light of the other direction in this association that has been extensively studied in the literature; we know that mental health difficulties, specifically externalising difficulties, predict placement instability for CECYP, (Konijn et al., 2019). This highlights the potentially cyclical relationship between mental health and placement instability. CECYP are more likely to experience mental health difficulties (Engler et al., 2022), which may be deemed difficult to manage, particularly in the case of externalising difficulties. This could lead to a child being moved, which in turn impacts on their mental health, both increasing risk of internalising and externalising difficulties as shown in

this study, risking leading to further placement breakdown and instability. This cycles risks exacerbating difficulties for a highly vulnerable population group. Findings from a qualitative study with carers suggest that 'things might get worse before they get better', implying that moving children when they display difficult behaviour while in care, might be inappropriate and that recovery from maltreatment takes time and adjustment to new care placements (Turner et al, 2022). This also highlights a need for effective intervention for carers and the right resourcing for placements, to ensure that the systems surrounding CECYP are well equipped to support their mental health needs and difficulties when they arise, to mitigate the negative sequelae of placement instability.

Strengths, limitations and future directions

A strength of this review is the large number of prospective cohort studies included, which captures the impact of placement instability over time. However, there are a small number of cross-sectional studies included in the review. For these papers, it is impossible to determine causality and directionality in the relationship, and we base our decision on how the authors conceptualised the relationship, with placement instability being the exposure and mental health as the outcome.

There was large variation in how the different studies measure placement instability, or what constitutes a change in placement, which could in part explain some of the heterogeneity found in the meta-analysis. Some of the categorisation of instability may also miss out on variation in terms of number of moves experienced and be less sensitive to estimating effects on mental health outcomes. This highlights the need for a consensus within research on how placement instability is operationalised to assist future synthesis of the findings.

The time frames in which placement instability is measured varied across studies. Future research can assess whether variation in time frame impacts on the association between placement instability and mental health outcomes. Further, across the studies included in the review, the mental health outcomes are mostly measured by carers. Only two studies included in the review include a self-report measure of mental health difficulties (Mishra et al., 2020; Villodas et al., 2016). This highlights the need for more research that includes youth report, especially in the internalising domain as youth are the preferred informant on their

internalising difficulties, as there can be discrepancies with parent/carer reports (Caqueo-Urízar et al., 2022).

Conclusion

This review has evidenced that above and beyond many other factors (such as initial mental health, age, and sex), placement instability has a negative, albeit small, effect on mental health difficulties of CECYP. Therefore, providing stable and secure placements should be a priority in order to ensure the best outcomes for CECYP. As a population group, CECYP have been exposed to much adversity in their lives, and placement instability can further exacerbate these difficulties. Therefore, it is imperative that policy and service providers ensure support for carers is available, to prevent the cycle of placement instability and meet the needs of CECYP.

Statements and declarations

There was no funding associated with this review and the authors have no competing interests to declare.

References

Aarons, G. A., James, S., Monn, A. R., Raghavan, R., Wells, R. S., & Leslie, L. K. (2010). Behavior problems and placement change in a national child welfare sample: A prospective study. *Journal of the American Academy of Child & Adolescent Psychiatry*, *49*(1), 70-80.

Achenbach, T. M. (1966). The classification of children's psychiatric symptoms: a factor-analytic study. *Psychological Monographs: general and applied*, *80*(7), 1.

Achenbach, T. M. (2001). Manual for ASEBA school-age forms & profiles. *University of Vermont, Research Center for Children, Youth & Families*.

Asif, N., Breen, C., & Wells, R. (2024). Influence of placement stability on developmental outcomes of children and young people in out-of-home care: Findings from the Pathways of Care Longitudinal Study. *Child Abuse & Neglect*, *149*, 106145

Barber, J. G., & Delfabbro, P. H. (2003). Placement stability and the psychosocial well-being of children in foster care. *Research on Social Work Practice*, *13*(4), 415-431.

Baujat, B., Mahé, C., Pignon, J. P., & Hill, C. (2002). A graphical method for exploring heterogeneity in meta-analyses: application to a meta-analysis of 65 trials. *Statistics in medicine*, *21*(18), 2641-2652.

Beck, A. (2006). Addressing the mental health needs of looked after children who move placement frequently. *Adoption & Fostering*, *30*(3), 60-65.

Caqueo-Urízar, A., Urzua, A., Villalonga-Olives, E., Atencio-Quevedo, D., Irarrázaval, M., Flores, J., & Ramirez, C. (2022). Children's mental health: Discrepancy between child self-reporting and parental reporting. *Behavioral Sciences*, *12*(10), 401.

Cohen J. (1988). Statistical Power Analysis for the Behavioral Sciences. New York, NY: Routledge Academic

Crowe, M. (2013). Crowe critical appraisal tool (CCAT) user guide. *Conchra House*, *10*.

DeGue, S., & Spatz Widom, C. (2009). Does out-of-home placement mediate the relationship between child maltreatment and adult criminality?. *Child Maltreatment*, *14*(4), 344-355.

Dumaret, A. (1988). The SOS Children's Villages: School Achievement of Subjects reared in a permanent Foster Care: PART ONE. *Early Child Development and Care*, *34*(1), 217-226.

Engler, A. D., Sarpong, K. O., Van Horne, B. S., Greeley, C. S., & Keefe, R. J. (2022). A systematic review of mental health disorders of children in foster care. *Trauma, Violence, & Abuse*, *23*(1), 255-264.

Fisher, P. A., Mannering, A. M., Van Scoyoc, A., & Graham, A. M. (2013). A translational neuroscience perspective on the importance of reducing placement instability among foster children. *Child Welfare*, *92*(5), 9.

Gypen, L., Vanderfaeillie, J., De Maeyer, S., Belenger, L., & Van Holen, F. (2017). Outcomes of children who grew up in foster care: Systematic-review. *Children and Youth Services Review*, *76*, 74-83.

Higgins, J. P., Thompson, S. G., Deeks, J. J., & Altman, D. G. (2003). Measuring inconsistency in meta-analyses. *BMJ (Clinical research ed.)*, *327*(7414), 557–560. https://doi.org/10.1136/bmj.327.7414.557

Hiller, R. M., Fraser, A., Denne, M., Bauer, A., & Halligan, S. L. (2023). The development of young peoples' internalising and externalising difficulties over the first three-years in the public care system. *Child maltreatment*, *28*(1), 141-151.

Hiller, R. M., & Clair, M. C. S. (2018). The emotional and behavioural symptom trajectories of children in long-term out-of-home care in an English local authority. *Child Abuse & Neglect*, *81*, 106-117.

Hussey, D. L., & Guo, S. (2005). Characteristics and trajectories of treatment foster care youth. *Child welfare*, 485-506.

Konijn, C., Admiraal, S., Baart, J., Van Rooij, F., Stams, G. J., Colonnesi, C., ... & Assink, M. (2019). Foster care placement instability: A meta-analytic review. *Children and Youth Services Review*, *96*, 483-499.

Lenhard, W. & Lenhard, A. (2022). *Computation of effect sizes*. Retrieved from: https://www.psychometrica.de/effect_size.html. Psychometrica. DOI: 10.13140/RG.2.2.17823.92329

Lewis, E. E., Dozier, M., Ackerman, J., & Sepulveda-Kozakowski, S. (2007). The effect of placement instability on adopted children's inhibitory control abilities and oppositional behavior. *Developmental Psychology*, *43*(6), 1415.

Lippard, E. T., & Nemeroff, C. B. (2020). The devastating clinical consequences of child abuse and neglect: increased disease vulnerability and poor treatment response in mood disorders. *American journal of psychiatry*, *177*(1), 20-36.

Linares, L. O., Li, M., Shrout, P. E., Ramirez-Gaite, M., Hope, S., Albert, A., & Castellanos, F. X. (2010). The course of inattention and hyperactivity/impulsivity symptoms after foster placement. *Pediatrics*, *125*(3), e489-e498.

Liu, J., Chen, X., & Lewis, G. (2011). Childhood internalizing behaviour: analysis and implications. *Journal of psychiatric and mental health nursing*, *18*(10), 884-894.

Lockwood, K. K., Friedman, S., & Christian, C. W. (2015). Permanency and the foster care system. *Current Problems in Pediatric and Adolescent Health Care*, *45*(10), 306-315.

Lohr, W. D., & Jones, V. F. (2016). Mental health issues in foster care. *Pediatric annals*, *45*(10), e342-e348

MacKenzie, M. J., Gearing, R. E., Schwalbe, C. S., Ibrahim, R. W., Brewer, K. B., & Al-Sharaihah, R. (2014). Child mental health in Jordanian orphanages: effect of placement change on behavior and caregiving. *BMC pediatrics*, *14*, 1-8.

Maguire, D., May, K., McCormack, D., & Fosker, T. (2024). A Systematic Review of the Impact of Placement Instability on Emotional and Behavioural Outcomes Among Children in Foster Care. *Journal of Child & Adolescent Trauma*, 1-15.

Mishra, A. A., Schwab-Reese, L. M., & Murfree, L. V. (2020, April). Adverse childhood experiences associated with children's patterns of out of home placement over time and subsequent negative outcomes during adolescence. In *Child & youth care forum* (Vol. 49, pp. 247-263). Springer US.

Muniz, C. N., Fox, B., Miley, L. N., Delisi, M., Cigarran, G. P., & Birnbaum, A. (2019). The effects of adverse childhood experiences on internalizing versus externalizing outcomes. *Criminal Justice and Behavior*, *46*(4), 568-589.

Newton, R. R., Litrownik, A. J., & Landsverk, J. A. (2000). Children and youth in foster care: Disentangling the relationship between problem behaviors and number of placements. *Child abuse & neglect*, *24*(10), 1363-1374.

NICE guideline, Looked- after children and young people (2021) Accessed 2022 from: https://www.nice.org.uk/guidance/ng205

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Bmj*, *372*.

Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., ... & Duffy, S. (2006). Guidance on the conduct of narrative synthesis in systematic reviews. *A product from the ESRC methods programme Version*, *1*(1), b92.

Proctor, L. J., Skriner, L. C., Roesch, S., & Litrownik, A. J. (2010). Trajectories of behavioral adjustment following early placement in foster care: Predicting stability and change over 8 years. *Journal of the American Academy of Child & Adolescent Psychiatry*, *49*(5), 464-473.

R Core Team (2024). _R: A Language and Environment for Statistical Computing_. R Foundation for Statistical Computing, Vienna, Austria. <https://www.R-project.org/>.

Rosenthal, J. A., & Villegas, S. (2010). Living situation and placement change and children's behavior. *Children and Youth Services Review*, *32*(12), 1648-1655.

Rubin, D. M., Alessandrini, E. A., Feudtner, C., Mandell, D. S., Localio, A. R., & Hadley, T. (2004). Placement stability and mental health costs for children in foster care. *Pediatrics*, *113*(5), 1336-1341.

Rubin, D. M., Downes, K. J., O'Reilly, A. L., Mekonnen, R., Luan, X., & Localio, R. (2008). Impact of kinship care on behavioral well-being for children in out-of-home care. *Archives of pediatrics & adolescent medicine*, *162*(6), 550-556.

Rubin, D. M., O'Reilly, A. L., Luan, X., & Localio, A. R. (2007). The impact of placement stability on behavioral well-being for children in foster care. *Pediatrics*, *119*(2), 336-344.

Strijker, J., Knorth, E. J., & Knot-Dickscheit, J. (2008). Placement History of Foster Children. *Child welfare*, *87*(5), 107-124.

Tarren-Sweeney, M. (2008). Retrospective and concurrent predictors of the mental health of children in care. *Children and youth services review*, *30*(1), 1-25.

Turner, F., Venturini, E., Kainth, G., Crawford, K., O'Connor, R., Balestrieri, M., & Minnis, H. (2022). The expected and the unexpected in recovery and development after abuse and neglect: the role of early foster carer commitment on young children's symptoms of attachment disorders and mental health problems over time. *Child Abuse & Neglect*, *127*, 105585.

Woodall, T., Browne, K. D., Green, K., & Majumder, P. (2023). An exploration of young people's experiences relating to stability and permanence throughout their care journey. *Qualitative Social Work*, *22*(4), 771-794.

Vanschoonlandt, F., Vanderfaeillie, J., Van Holen, F., De Maeyer, S., & Andries, C. (2012). Kinship and non-kinship foster care: Differences in contact with parents and foster child's mental health problems. *Children and Youth Services Review*, *34*(8), 1533-1539.

Vevea, J. L., & Coburn, K. M. (2015). Maximum-likelihood methods for meta-analysis: A tutorial using R. *Group Processes & Intergroup Relations*, *18*(3), 329-347.

Viechtbauer W (2010). "Conducting meta-analyses in R with the metafor package." *Journal of Statistical Software*, **36**(3), 1–48. doi:10.18637/jss.v036.i03.

Villodas, M. T., Litrownik, A. J., Newton, R. R., & Davis, I. P. (2016). Long-term placement trajectories of children who were maltreated and entered the child welfare system at an early age: Consequences for physical and behavioral well-being. *Journal of pediatric psychology*, *41*(1), 46-54.

Vreeland, A., Ebert, J. S., Kuhn, T. M., Gracey, K. A., Shaffer, A. M., Watson, K. H., & Compas, B. E. (2020). Predictors of placement disruptions in foster care. *Child abuse & neglect*, *99*, 10

Chapter 2: Major Research Project

A longitudinal study examining the effect of carer-child relationship quality on child's emotional and behavioural difficulties while in foster care.

Prepared in accordance with the author requirements for the Journal of Child Psychiatry and Psychology (JCPP)
(Author submission guidelines)

Plain language summary

Title: A longitudinal study examining the effect of carer-child relationship quality on child's emotional and behavioural difficulties while in foster care.

Background: Early relationships between a caregiver and child are important for many aspects of a child's development (Hornor, 2019). Children who experience abuse or neglect from their caregivers, may develop a range of difficulties in childhood and later in life, including mental health difficulties (Engler et al., 2022) and some may be placed in care.

Aims and Questions: This study aims to explore how the quality of a relationship between a foster carer and child affects the child's emotional and behavioural difficulties over time.

1. How does the quality of the carer-child relationship relate to child emotional and behavioural difficulties shortly after entry to care and 2.5 years after care entry?
2. Does the quality of the carer-child relationship predict the child's emotional and behavioural difficulties at a later time point, above and beyond the effect of number of placement moves?
3. What is the direction of the association between carer-child relationship and child emotional and behavioural difficulties over time?

Methods: Participants were recruited as part of the Best Services Trial (BeST$^{?}$). BeST$^{?}$ is a trial which is comparing the New Orleans Intervention Model (NIM), an approach which provides assessment and intervention for children in foster care, compared to treatment as usual. Families were invited to take part in the trial if they had a child aged between 0-5 years when entering an episode of foster care, in either Glasgow or South London. A total of 488 children, from 382 families, consented to the trial, 378 of whom were in Glasgow and 110 in London. Data was used from two time points, a few weeks after entering care and 2.5 years after being in care. Data was collected using questionnaires and video recording of the carer and child.

Main findings and conclusions: The quality of the carer-child relationship did not predict emotional and behavioural outcomes for the child at the later time point. The quality of the carer-child relationship was not stable over time, whereas child emotional and behavioural

difficulties showed stability. We did find that overall children had better relationships with their carers at the 2.5 year follow up than at the initial time point.

References

Engler, A. D., Sarpong, K. O., Van Horne, B. S., Greeley, C. S., & Keefe, R. J. (2022). A systematic review of mental health disorders of children in foster care. *Trauma, Violence, & Abuse*, *23*(1), 255-264.

Hornor, G. (2019). Attachment disorders. *Journal of pediatric health care*, *33*(5), 612-622.

NICE guideline, Looked- after children and young people (2021) Accessed 2022 from: https://www.nice.org.uk/guidance/ng205

Abstract

Background: Early relationships between caregiver and child set the foundations for many aspects of the child's development (Hornor, 2019). Exposure to abuse or neglect can negatively impact the security and stability within early relationships, particularly as children enter foster care following maltreatment (Prather & Golden, 2009). A child in care is likely to be exposed to different carers, and currently there is little research exploring how changes in relationship between carer and child, over time, impact the child's emotional and behavioural difficulties. The primary aim of this project is to characterise the association between carer-child relationship quality and child's mental health, over a period of time a child is in foster care.

Methods: This project uses existing data of 220 children, collected between 2011- 2022 as part of the Best Services Trial (BeST$^{?}$). Relationship quality was assessed using Parent-Infant Relationship Global Assessment Scale (PIR-GAS), and child emotional and behavioural difficulties was assessed using the Strengths and Difficulties Questionnaire (SDQ) and The Infant Toddler Social Emotional Assessment (ITSEA). Additional domains considered and measured included placement moves, age at entry to care, and sex of the child. Data was examined from two time points, time one (a few weeks after entering care) and after 2.5 years in care.

Results: The quality of the carer-child relationship did not predict emotional and behavioural outcomes for the child at a later time point, and the quality of the carer-child relationship was not stable over time, whereas child emotional and behavioural difficulties showed stability. Nonetheless, we found that overall children had significantly better relationships with their carers at the 2.5 year follow up than at baseline.

Conclusions: The findings of this study highlight a need for specific tailored interventions for care experienced children, to support their emotional and behavioural needs and improve long term outcomes for this population.

Keywords: Foster care, placement instability, mental health, carer-child relationship quality.

Introduction

In 2021/2022 there were approximately 105,400 children and in care in the United Kingdom, and this number is growing with an increase of 9% in the past five years (Department of Education, 2022). This number includes children who have been placed in foster care, kinship care, those who remain at home with their parents (Scotland) and those in residential accommodation. Due to different legal systems in Scotland, many children who are in the care system continue to live at home with their parents but are under a supervision requirement, which requires them to have regular contact with social services (Scottish Government, 2023). Reasons for entry to care vary, with the most common reason being abuse or neglect, and all looked-after children and young people will have experienced some level of adversity (NICE, 2021). These experiences are often referred to as adverse childhood experiences (ACE's) which is a term used to categorise stressful events that occur in childhood, such as exposure to domestic abuse, having a parent with a mental health condition, a household member being in prison and exposure to abuse and neglect (Felitti et al., 1998). A large cohort study conducted in the USA found that 40.8% of children and young people in care reported between six and nine ACE's and 37.4% reported more than ten ACE's (Liming, Akin & Brook, 2021). Therefore, this early exposure to adversity can have an impact on how children go on to form relationships with their caregivers, considering children's feelings of safety and security being disrupted by the maltreatment (Turner et al., 2019).

The caregiver-child relationship is the first crucial relationship that a child forms, and the quality of this relationship impacts many aspects of the child's development (Hornor, 2019). Based on attachment theory, the security of the early parent child relationship impacts how the child forms interpersonal relationships throughout the course of their life (Bowlby, 1969). A secure attachment forms when a child perceives their caregiver to be responsive and sensitive to their needs and offers a safe base for them to explore the world from (Ribera et al., 2023). A lack of an early secure attachment can impact on a child's mental health, with reviews of the literature finding that insecure attachment is associated with higher levels of anxiety and internalising difficulties compared to secure attachments (Colonnesi et al., 2011; Brumariu & Kerns, 2010). Early exposure to adversity and caregiver disruption hinders the development of secure attachments (Prather & Golden, 2009). A meta-analysis examining the

attachment of pre-school aged children in foster care, found that approximately 40% of children in care had insecure attachments and approximately 22% of children had disorganised attachment (Vasileva & Petermann, 2018).

Children in care are also at risk of developing attachment disorders, such as reactive attachment disorder (RAD) (Turner et al., 2019; Oliveira et al., 2022). Children with RAD show disturbances in how they interact with others, and this is characterised by lack of attachment behaviours (e.g., reaching out to be picked up), focused towards their caregiver(s). Children with RAD display these disturbances across individuals and contexts rather than just with the primary caregiver (Román et al.,2022). Risk factors for RAD include; neglect, physical abuse, sexual abuse, parental alcoholism, parental mental illness, parental drug use, and the absence of a consistent primary caregiver (Guttmann-Steinmetz & Crowell, 2006), commonly present in children who have entered into care. These difficulties may therefore impact how they interact with their carer and in turn pose challenges on the quality of the child-carer relationship.

Due to these early attachment disruptions as well as high levels of adversity often experienced by children in care, this population group are especially at risk for developing mental health difficulties. Compared to the general population, it has been estimated that children in care are three times more likely to have a mental health disorder than in children who have not been in care (Lohr & Jones, 2016). These numbers are high, with one study finding that 60.5% of pre-school aged children who are in care have a diagnosis of at least one mental health disorder (Hillen & Gafson, 2015). The most common diagnoses of children in care were found to be major depressive disorder, oppositional defiant disorder, conduct disorder, reactive attachment disorder and post-traumatic stress disorder (Engler et al., 2022). Levels of externalising difficulties (such as hyperactivity or behavioural difficulties) are also common, with one study finding 40.6% of a sample of children in care having externalising difficulties (Vanschoonlandt et al., 2013).

Another factor which has been found to impact the mental health of children in care is the number of care placements they experience. Throughout their time in care, children may experience multiple placement changes, with 10% of children in care in England and 4% of

children in care in Scotland experiencing three or more placements moves within a 12-month period (Department of Education, 2022; Scottish Government, 2023). This instability in residence, also represents an instability in caregiving which could lead to children struggling to develop meaningful relationships with caregivers. There is a significant body of literature exploring the impact of placement instability on emotional and behavioural difficulties of children in care, which shows that placement instability is associated with poorer outcomes (Cullen et al., 2022; Mishra et al., 2020; Delaville & Pennequin, 2020). Importantly, stable care placements are associated with positive emotional and behavioural outcomes for children (Bederian-Gardner et al., 2018; McGuire et al., 2018; Fernandez, 2008; Proctor et al., 2010). Therefore, placement instability is an important factor to consider when exploring the impact of the carer-child relationship on mental health outcomes for care experienced children and young people. This study aims to explore whether the carer-child relationship predicts emotional and behavioural difficulties, above and beyond placement stability/instability.

The current study and aims

The current evidence base highlights the importance of a good quality relationship between carer and child, however this relationship has not been examined longitudinally for children who are in care, especially in early childhood. There is also a lack of research which explores the association between carer-child relationship and child mental health outcomes, and it is unclear how these two domains impact on one another, above and beyond the impact of number of placements a child has experienced. Therefore, the primary aim of this project is to characterise the strength and direction of the association between carer-child relationship quality and child's emotional and behavioural difficulties, over a period of time a child is in foster care. A secondary aim is to understand the unique effects of carer-child relationship quality on child's emotional and behavioural difficulties, above and beyond the effects of relevant factors including child sex, age at entry to care, and number of placement moves.

Research Questions

1. What is the direction of the association between carer-child relationship and child emotional and behavioural difficulties over time?

2. Does the quality of the carer-child relationship predict the child's emotional and behavioural difficulties at a later time point, above and beyond the effect of number of placement moves?

Method

Design and Procedure

This study used a longitudinal repeated measures design, using existing data collected between 2011- 2022 as part of the Best Services Trial (BeST?) (Crawford et al., 2022). BeST? is a randomised control trial comparing an infant mental health service (the New Orleans Intervention Model (NMI) with the Social Work Services (as usual). The aim of this trial was to explore what the best service is for abused and neglected pre-school aged children coming into foster care. Families were invited to take part in the trial if they had a child aged between 0-5 years when entering an episode of foster care, in either Glasgow or South London. Participants completed quantitative measures over a period of 2.5 years. Measures of child mental health and carer-child relationship functioning were collected at three time points throughout the trial; 1) a few weeks after entering foster care (T1), 2) 15 months after entering care (T2) and 3) 2.5 years after entering care (T3). To be eligible for inclusion in this current study, participants had to have completed a baseline rating of the quality carer-child relationship at T1 and data were used from baseline collection (T1) and follow up (T3). The decision was made not to use data from T2, due to ratings of carer-child relationship quality being missing or deemed not ratable at that timepoint due to disruptions to how the data was collected at that time, which overlapped with COVID-19 restrictions. To complete the assessments, carers were invited to health care settings where they completed a number of questionnaires and a video recording was taken to observe interactions which was used to score the quality of the relationship. Due to the COVID-19 pandemic and lockdown restrictions, some carers were asked to complete these measures and video recordings at home.

The BeST? Trial was approved by the West of Scotland Research Ethics Service, Committee 3 (approval number 15/WS/0280) and this current study was covered within the project's

ethical approval (Crawford et al., 2022). Informed written consent was obtained from all carers and each child (participant) in the study was assigned a unique ID number to link their data throughout the trial in order to maintain confidentiality.

Participants

The total number of participants recruited to the BeST$^{?}$ was 488 children, from 382 families, 378 of whom were in Glasgow and 110 in London. Of this sample, data from 220 participants who had a rating of the quality carer-child relationship at T1 were included in this study. Of those, 101 participants had complete data across T1 and T3. The age range of the participants was between less than a year and five and a half years. The sample characteristics of the 220 participants included are summarised in Table 1.

Table 1

Sample Characteristics

Demographics		%
Sex	Male	53.64%
	Female	46.36%
Ethnicity	White	88.43%
	Mixed	5.09%
	Asian/ Asian British	4.16%
	Black/Black British	2.31%
Supervision order	Compulsory	52.73%
	Voluntary	47.27%
Index of Multiple Deprivation (IMD)	1 (most deprived)	63.47%
	2	18.72%
	3	9.13%
	4	5.48%
	5	2.28%
	6 (least deprived)	0.92%

Materials and measures

Child emotional and behavioural difficulties

Depending on child age, emotional and behavioural difficulties were measured using one of two or both measures: the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) and the Infant Toddler Social Emotional Assessment (ITSEA; Briggs-Gowan & Carter, 2006), described below.

SDQ is a measure which is used to assess child's mental health in children aged 2-17 years old (Goodman, 1997). The 25-item carer-report version of the SDQ was used in this study. The version used with two to four year olds has three items modified from the original four to 17 year old version, to ensure developmental appropriateness (Croft et al., 2015), both versions of the SDQ were used in this trial (2-4 years and 4-17 years). The SDQ has 5 subscales; emotional symptoms subscale, conduct problems, hyperactivity/inattention, peer relationship problems and prosocial behaviour. These are scored on a three-point scale; not true, somewhat true and certainly true. Somewhat true is always scored as a 1, but the score for not true and certainly true varies between the item (either scored as 0 or 2). The scores from all the subscales, excluding prosocial behaviour, add together to generate a total difficulties score, which was the score used in this study, with higher scores indicative of more difficulties. The SDQ has been shown to have good reliability and validity (Goodman, 2001).

For children under the age of 2, the ISTEA was used (Briggs-Gowan & Carter, 2006). This is a carer-report measure used to assess social-emotional and behavioural problems. It consists of 166 items across 4 domains; externalising (activity/impulsivity, aggression/defiance and peer aggression), internalising (depression/withdrawal, general anxiety, separation distress and inhibition to novelty), dysregulation (negative emotionality, sleep and eating problems, sensory sensitivity) and competence (attention, mastery, motivation, play, empathy and prosocial peer relations). Items are rated as 0=not true/rarely true, 1=somewhat true/sometimes and 2= very true/always. For some items there is an option to respond 'N', which would be used where the parent or carer has not had the opportunity to observe that behaviour. In these instances, items marked 'N' are scored as missing or 'M' and if there are two or more 'M' answers in each subscale the subscale cannot be used. For this study the ITSEA was scored in alignment with the manual. The ISTEA has been found to be a valid measure to assess emotional and behaviour problems in children under 2 years (Carter et al., 2003).

Total emotional and behavioural difficulties score was computed using either the SDQ or ITSEA, depending on availability, and converted into a standardised z score to allow comparability. For the ITSEA an average of both the internalising and externalising z-scores represented total emotional and behavioural difficulties score. For the SDQ the total difficulties score was converted into a z score. Where there was both an SDQ score and an ITSEA score available for one child, the SDQ score was prioritised and used.

Carer-child relationship functioning

The Parent Infant Relationship Global Assessment Scale (PIR-GAS; Zero to Three, 1994) was used to assess carer-child relationship quality as indicated by Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood (DC:0-3). The PIR-GAS is commonly used as a rating instrument and is used in clinical settings to observe parent-infant relationships, to describe the strengths of a relationship as well as the severity of a disorder. PIR-GAS can also be used as a research tool (Müller et al., 2013). Three aspects of the relationship are evaluated: *behavioural quality of interactions, affective tone,* and *psychological involvement.* The relationship is initially placed into one of ten categories ranging from well adapted (100-91) to grossly impaired (10 and under), therefore a higher score would indicate a better quality relationship. A continuous measure of carer and child relationship quality was created by choosing a final score within the chosen decile.

PIR-GAS scores were derived from video recording of the carer child interaction. Carers were asked to play with their child for a period of time and eat lunch with their child and both elements were recorded. The videos were rated by a team of trained raters, including the primary author, and scored using the PIR-GAS rating scale. Twenty percent of the videos were watched by a second rater to establish inter-rater reliability. Where there was a discrepancy of more than 10 points, scores were discussed at conference with experienced PIR-GAS raters, including the research supervisor, and a final score was agreed.

Placement instability

To explore the number of placement moves each child experienced prior to the trial, a binary variable was created. This was coded as 0 or 1, where 0 was no prior placement moves

and 1 was one or more placement moves. In total 174 children had experienced 0 prior placement moves, 22 had experienced 1 placement move and 2 had experienced 2 or more placement moves.

Analytic strategy

Analyses were conducted using R Studio (R version 4.3.3). Preliminary screening of the data was conducted using descriptive statistics and visualised using histograms and scatterplots to assess normality (univariate distributions) and linearity (bivariate distributions), respectively. To examine the associations between carer-child relationship quality and child emotional and behavioural difficulties at the two time points, bivariate Pearson correlations were estimated.

To examine if the quality of the carer-child relationship at T1 predicts child emotional and behavioural difficulties at T3, above and beyond the number of previous placements and whilst controlling for child initial emotional and behavioural difficulties, multiple regression analysis was used. Two regression models were estimated, firstly using PIR-GAS score at T1 as the predictor and next using a PIR-GAS change score as the predictor (the difference between T1 PIR-GAS score and T3 PIR-GAS score).

To explore the longitudinal association between carer and child relationship quality and child emotional and behavioural difficulties and the direction of this relationship, a cross-lagged path analysis model was estimated. This model was estimated using the lavaan package (version 0.6–7; Rosseel, 2012) and adjusted for multivariate non-normality using maximum likelihood estimation with robust standard errors and fit statistics (Yuan & Bentler, 2000). Missing ratings were handled using full-information maximum likelihood. The model estimated was fully saturated and therefore model fit was not assessed. A sensitivity analysis was conducted, estimating the same cross-lagged panel model, using data from the subset of participants who have complete data across T1 and T3.

Sample size

To make sure the current study would be well powered, a sample size analysis was calculated prior to data analysis. This was completed based on previous effect taken from

research with the same sample using the SDQ scores at time 3 and carer commitment scores at time 1. With an effect size of .201, in a multiple regression with 4 predictors using a power of 0.8 and an alpha level of .05, it was estimated we would need a sample of 66 participants. For path analysis the recommended sample size is 10- 20 times the number of parameters in the model (Klein, 1998). Our path analysis includes 8 free parameters, and as such a sample of 220 (and a sample of 101 with only complete data) is well powered to conduct the analysis.

Results

Descriptives and Correlations

Table 2 presents the descriptive statistics for the variables included in this study (n=220) and shows the degree of missingness across variables and timepoints. Table 3 shows the bivariate correlations. Overall, there was no meaningful correlation between the quality of the carer-child relationship (PIR-GAS score) and the child's emotional and behavioural difficulty score at T1 and T3; all associations were non-significant and small. Emotional and behavioural difficulties at T1 showed a small-moderate and significant correlation with emotional and behavioural difficulties at T3 (r = .30, p < .001). There was a small-moderate negative correlation between placement instability and PIR-GAS T3 (r = -0.34, p < .01), indicating instability was associated with poorer relationship quality at T3. Placement instability also had a small significant association with emotional and behavioural difficulties at T3 (r = 0.19, p < 0.01). Sex and PIR-GAS at T1 show a weak but significant correlation (r = 0.20, p < 0.01), indicating that higher quality relationship is reported with females as compared to males. Age at T1 showed a weak but significant correlation with emotional and behavioural difficulties at T3 (r = 0.18, p < 0.01) and PIR-GAS T1 (r=0.23, p<0.01), indicating that older age at entry to care is associated with better relationship quality ratings at T1 and higher emotional and behavioural difficulties at T3.

Table 2

Descriptives of Variables

Variable	N	Mean	SD	Min	Max
Age (T1)	220	2.44	1.58	0.08	5.58

PIR-GAS T1	220	80.07	13.58	25	100
PIR-GAS T3	101	85	10.58	35	98
Emotional & behavioural difficulty T1	146	-0.02	0.91	- 1.52	2.60
Emotional & behavioural difficulty T3	188	0.00	1.00	-1.55	2.67
SDQ raw score T1	102	12.20	8.01	0.00	33
SDQ raw score T3	188	11.36	7.35	0.00	31
ITSEA internalising raw score T1	69	0.47	0.25	0.00	1.06
ITSEA externalising raw score T1	69	0.61	0.41	0.00	1.58
ITSEA internalising raw score T3	5	0.45	0.30	0.10	0.76
ITSEA externalising raw score T3	5	0.30	0.22	0.00	0.53

Table 3

Correlations Among Variables

Variable	1	2	3	4	5	6	7
1.PIR-GAS T1	1						
2. PIR-GAS T3	0.10	1					
3. Emotional & behavioural difficulties T1	-0.09	0.04	1				
4. Emotional & behavioural difficulties T3	-0.06	-0.10	0.30*	1			
5.Placement instability	0.05	-0.34*	0.04	0.19*	1		
6. Sex	0.20*	0.00	-0.04	-0.06	0.05	1	
7. Age T1	0.23*	0.05	-0.03	0.18*	0.05	-0.06	1

*Note *significant at p ≤ 0.05.*

Multiple Regression

Table 4 summarises the results from the multiple regression analysis with emotional and behavioural difficulties at T3 as the outcome. The first model uses PIR-GAS score at T1 as the predictor and the second model uses PIR-GAS change score as the predictor (calculated by subtracting PIR-GAS score at T3 from PIR-GAS score at T1). Model 1 ($F(5,108) = 2.40$, $p=0.04$) explained 10% of the variance in child emotional and behavioural difficulties at T3, with an adjusted R^2 of 0.06. Model 2 ($F(5,68)=1.91$, $p=0.10$) explained 12.3% of the variance in child emotional and behavioural difficulties at T3, with an adjusted R^2 of 0.06. In both models, only child emotional and behavioural difficulties at T1 was a significant predictor of the outcome at T3. None of the other predictors had a significant effect, meaning that the quality of carer-child relationship at T1, or the change in this relationship, did not predict child emotional and behavioural difficulties at T3 above and beyond other variables considered, which also did not present with any significant effects on the outcome.

Table 4

Multiple Regression Models Examining Unique Effects on Child Emotional & Behavioural Difficulties at T3

Model 1	b	β	t	*p*
PIR-GAS score T1	-0.00	-0.06	-0.63	0.53
Placement instability	0.21	0.08	0.84	0.40
Sex	-0.07	-0.03	-0.35	0.73
Age at T1	0.10	0.12	1.33	0.19
Child emotional & behavioural difficulties T1	0.28*	0.28	3:03	<.001
Model 2				
PIR-GAS change score	-0.00	-0.02	-0.18	0.86
Placement instability	0.18	0.06	0.46	0.65
Sex	-0.02	-0.01	-0.10	0.92
Age at T1	0.07	0.10	0.83	0.41
Child emotional & behavioural difficulties T1	0.32*	0.35	3.05	0<.001

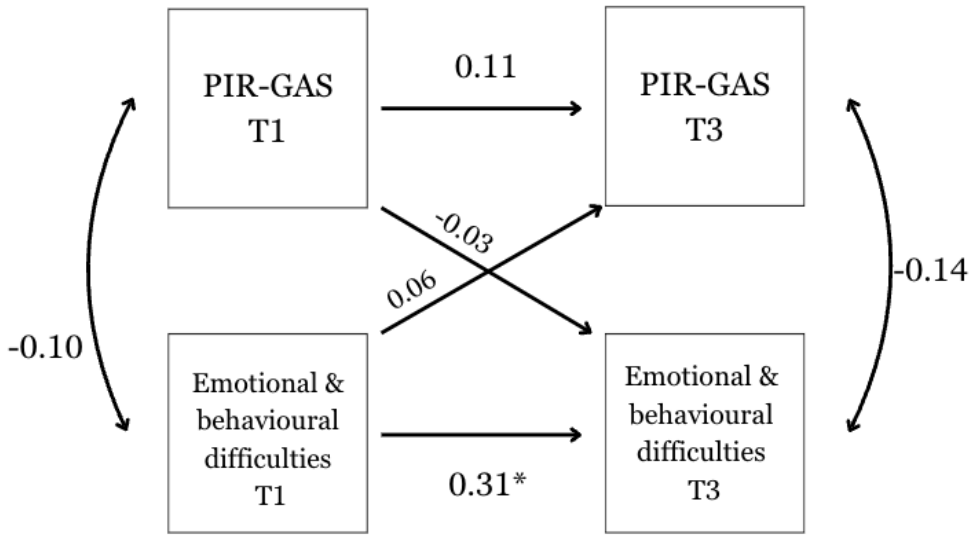
Note *significant at p<0.01

Cross Lagged Panel Model

Figure 1 below shows the cross lagged panel model, depicting the direction of the paths between PIR-GAS score and child emotional and behavioural difficulties score over time. The figure includes the standardised regression coefficients. This model was estimated using a proportion of the total sample (n=146) due to missing child emotional and behavioural difficulties scores at T1. As shown in Figure 1, there is no stability in PIR-GAS scores from T1 to T3 (β = 0.11, p=0.200). There is stability in emotional and behavioural difficulties scores from T1 to T3 (β =0.31, p= 0.002). None of the cross lagged effects were significant, and both very small. The model explains 10% of the variance in emotional and behavioural difficulties at T3 and 1.5% of the variance in PIR-GAS scores at T3. The sensitivity analysis (Figure 2), using only complete data across T1 and T3 (n = 101), yielded similar results.

Figure 1

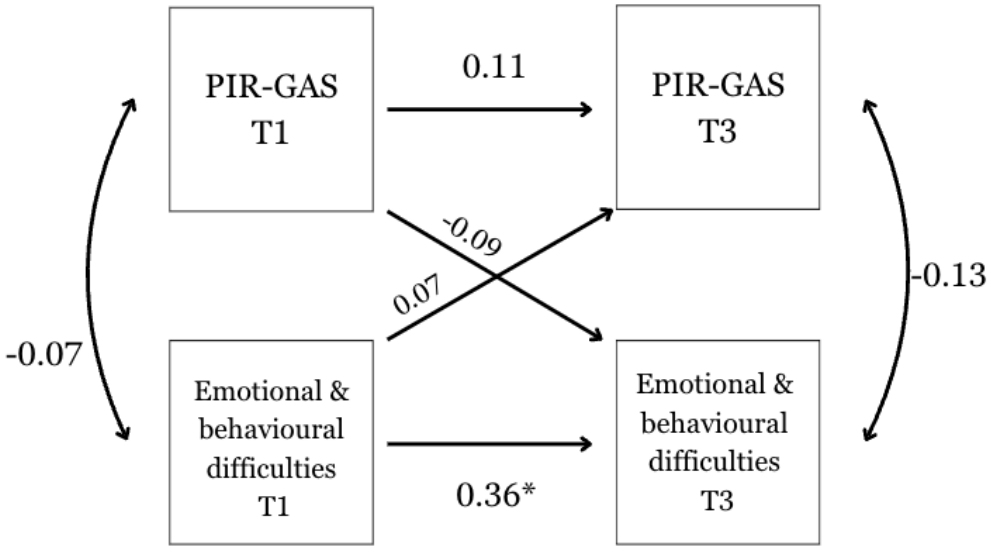
Path Analysis Model



Note Figure 1 shows the standardised regression coefficients of the stability between the variables at the same time point, and the standardised regression coefficients for the cross lagged variable. It also shows the correlation coefficients between variables at the same time point (double headed arrows). *indicates a p value of less than 0.05.

Figure 2

Path Analysis Model for the Sensitivity Analysis



Note Figure 2 shows the standardised regression coefficients of the stability between the variables at the same time point, and the standardised regression coefficients for the cross lagged variable. It also shows the correlation coefficients between variables at the same time point (double headed arrows). *indicates a p value of less than 0.05.

Based on these findings, further exploratory analysis was completed to examine the differences in PIR-GAS and emotional and behavioural difficulty scores between T1 and T3. The distribution of change scores were assessed by visually examining the histogram, with no issues noted with normality. Two paired samples t-tests were performed to compare the difference in PIR-GAS scores and in emotional and behavioural difficulties between T1 and T3. There was a significant difference, with higher PIR-GAS scores at T3 (*M* = 85.00 *SD* =10.58) than at T1 (*M* =80.07 *SD* =13.58), t(100)= 1.99, *p* = 0.0495 with a 95% mean difference confidence interval = 0.006, 6.092. The effect size as measured by Cohen's d was d=0.31, indicating a small effect. The findings indicate that the overall relationship quality between carer and child is rated as significantly better at T3 compared to T1. In terms of emotional and behavioural difficulties, the t-test showed no significant difference between the emotional and behavioural difficulty scores at T1 (M = 0.02, SD =0.91) and T3 (M =0.00, SD = 1.00), t(125)= 0.86, *p* = 0.39, with a 95% mean difference confidence interval = 0.11, 0.28. The effect size as measured by Cohen's d was d=0.02, indicating a very small effect; this is consistent with the stability noted in the cross-lagged model.

Discussion

The results of this study provide insight into how relationship quality between carer and child change over time spent in care, and the degree to which these relationships are implicated in the emotional and behavioural outcomes for the child. This study shows that the quality of the relationship between carer and child over time does not predict emotional and behavioural outcomes for the child, but the overall quality of the relationship between carer and child is significantly better later in the child's journey in care than early on.

Placement instability

Consistent with literature highlighting the detrimental impact of placement instability on children's mental health outcomes (Cullen et al., 2022; Maguire et al., 2024), placement instability at time in this study was significantly associated with poorer relationship quality and higher emotional and behavioural difficulties 2.5 years later. This confirms that history of placement instability is a risk factor for negative outcomes. It is important to note that in this sample, the first entry to care for the majority of the children (88%) was at the time of entering this study. This could be due to the young age of the children at time one, with the average age of the child being under one years of age. Nonetheless, even at this young age, the presence of early instability had an effect on relationship quality and emotional and behavioural outcomes. The foster care system in the UK is unstable relative to that of other countries. In Scotland, many children experience repeated short-term episodes of foster care, specifically in Glasgow where two thirds of children who returned home re-entered the care system, often being referred to the 'revolving door effect' (Minnis et al., 2010). It is important to invest in supportive and stable placements for children to ensure we promote healthy development and functioning (Asif et al., 2024). Relationship quality is a crucial factor in maintaining supportive and safe placements (Miller et al., 2019).

Effect of relationship quality on emotional and behavioural outcomes

Based on the importance of the relationship quality between child and carer, it was expected that better quality of the relationship would be associated and predictive of lower emotional and behavioural difficulties for the child. However, the results from this study found that the quality of the child's relationship with their foster carer did not predict later

emotional and behavioural difficulties. Similarly, sex, age at entry to care and placement instability also did not predict later emotional and behavioural difficulties. The only predictor of later emotional and behavioural difficulties was baseline emotional and behavioural difficulties, with no differences in average difficulties between baseline and two and a half years in care into their time in care during the study.

This is an important finding to consider, as to why when a child is removed from a neglectful and/or abusive home into a nurturing foster care do we not see improvement in their emotional and behavioural functioning over time. Research has shown that stable mental health profiles are the most common in care experienced children and young people (Hiller et al., 2023) and it was much less likely for children's mental health trajectory to change over time in care. Our findings show similar results. Another important consideration with children who have been abused and neglected is that as a group they are much more likely to have heritable neurodevelopmental conditions than their peers (not caused by abuse and neglect) (Dinkler et al., 2017). Minnis (2023) suggests that if the high rates of neurodevelopmental problems within this population are not due to the environment they are placed in, but more due to inherited difficulties, then it would not be expected that being placed in foster care would be able to 'treat' the difficulties, which again may speak to the stability of some of the emotional and behavioural difficulties measured in our study. This means that this group of children would require comprehensive mental health assessment and treatment, and care placement alone, even when the quality of child-carer relationship is good or improves, is not sufficient to address emotional and behavioural difficulties.

Stability in carer-child relationships

The lack of stability in the quality of the relationship between carer and child over time spent in care highlights the dynamic and evolving nature of relationships between foster carer and child. Nonetheless the relationship between carer and child improves over time spent in care, independent of early relationship quality at baseline (hence the lack of stability). This is a hopeful finding for care experienced children, as it shows the ability to improve a relationship with a caregiver over time spent in care, irrespective of their mental health and initial relationship quality. This suggests that, whilst living in foster care, an environment which is hopefully stable and nurturing, and given the time, children are able to build

connections with their caregiver and develop positive relationships. This is the first study we are aware of that has looked at this relationship over time using validated tools. It will be important to see how this relationship continues to change over a longer period of time in care, and for children at different developmental stages.

Limitations and future directions

This is the first study to examine how the quality of carer-child relationship changes over a period of time a child is in foster care and how this relates to child mental health, in a representative sample of young children in care. The BeST? trial set out to compare two different interventions for children in foster care. This study was proposed ahead of trial completion with a focus on developmental relationships, which were not expected to have been differently impacted by the treatment arms. Once the trial results are published, there might be an opportunity to explore whether the association between relationship quality and mental health outcomes depend on treatment arm. Although the sample size in this study was smaller than initially anticipated, due to missing data on the variables of interest, there was still sufficient information to answer the questions of interest. Further, attrition commonly occurs in longitudinal research, and in this study, it may also have been influenced by the COVID-19 pandemic, which occurred during the data collection period. Nonetheless, examination of sample characteristics based on those with and without PIRGAS at Time 1 (See Appendix J) and the sensitivity analysis conducted using the subsample with complete data at Time 1 and 2, suggest that there is no bias resulting from attrition or missingness.

Conclusions and implications

Overall, the findings from this study highlight the variable nature of relationships between carer and child and how they evolve over time, finding no stability in individual relationships but an improvement in the group as a whole over 2.5 years. As the quality of the relationship does not predict emotional and behavioural outcomes, there must be other factors which are influencing the emotional and behavioural difficulties of children in foster care, with a small effect observed due to initial placement instability. This highlights a need for further longitudinal research to better understand these relationships, and how they might support improvements in emotional and behavioural wellbeing of children in foster care. The results from this study show that simply placing a child in foster care and removing

them from a neglectful and/or abusive home environment, does not, by itself, improve their emotional and behavioural outcomes. This highlights the need for other measures to be put in place, including follow up assessments and the use of evidence-based treatment and management strategies which are tailored to care experienced children, in order to improve the long-term outcomes for this population.

Statements and declarations

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References

Asif, N., Breen, C., & Wells, R. (2024). Influence of placement stability on developmental outcomes of children and young people in out-of-home care: Findings from the Pathways of Care Longitudinal Study. *Child Abuse & Neglect*, *149*, 106145.

Bederian-Gardner, D., Hobbs, S. D., Ogle, C. M., Goodman, G. S., Cordón, I. M., Bakanosky, S., ... & NYTD/CYTD Research Group. (2018). Instability in the lives of foster and nonfoster youth: Mental health impediments and attachment insecurities. *Children and Youth Services Review*, *84*, 159-167.

Bowlby, J. (1969). *Attachment and loss* (No. 79). Random House

Briggs-Gowan, M. J., & Carter, A. S. (2006). *Brief Infant Toddler Social Emotional Assessment (BITSEA)* [Database record]. APA PsycTests. https://doi.org/10.1037/t14990-000

Brumariu, L. E., & Kerns, K. A. (2010). Parent–child attachment and internalizing symptoms in childhood and adolescence: A review of empirical findings and future directions. *Development and psychopathology*, *22*(1), 177-203.

Carter, A. S., Briggs-Gowan, M. J., Jones, S. M., & Little, T. D. (2003). The infant–toddler social and emotional assessment (ITSEA): Factor structure, reliability, and validity. *Journal of abnormal child psychology*, *31*, 495-514.

Crawford, K., Fitzpatick, B., McMahon, L., Forde, M., Miller, S., McConnachie, A., & Minnis, H. (2022). The Best Services Trial (BeST?): a cluster randomised controlled trial comparing the clinical and cost-effectiveness of New Orleans Intervention Model with services as usual (SAU) for infants and young children entering care. *Trials*, *23*(1), 1-16.

Croft, S., Stride, C., Maughan, B., & Rowe, R. (2015). Validity of the strengths and difficulties questionnaire in preschool-aged children. *Pediatrics*, *135*(5), e1210-e1219.

Colonnesi, C., Draijer, E. M., Jan JM Stams, G., Van der Bruggen, C. O., Bögels, S. M., & Noom, M. J. (2011). The relation between insecure attachment and child anxiety: A meta-analytic review. *Journal of Clinical Child & Adolescent Psychology*, *40*(4), 630-645.

Cullen, G. J., Yule, C., Walters, D., & O'Grady, W. (2022). Mental health outcomes of youth in-care: Investigating the effect of general strain and self-control theories. *Child and Adolescent Social Work Journal*, *39*(4), 409-423.

Delaville, E., & Pennequin, V. (2020). Foster placement disruptions in France: Effects on children and adolescents' emotional regulation. *Child and Adolescent Social Work Journal*, *37*(5), 527-536.

Dinkler, L., Lundström, S., Gajwani, R., Lichtenstein, P., Gillberg, C., & Minnis, H. (2017). Maltreatment-associated neurodevelopmental disorders: A co-twin control analysis. *Journal of Child Psychology and Psychiatry*, *58*(6), 691-701.

Department for Education (DfE) (2022a) Children looked after in England including adoption. London: Department for Education (DfE). Accessed 2024: https://explore-education-statistics.service.gov.uk/find-statistics/children-looked-after-in-england-including-adoptions

Engler, A. D., Sarpong, K. O., Van Horne, B. S., Greeley, C. S., & Keefe, R. J. (2022). A systematic review of mental health disorders of children in foster care. *Trauma, Violence, & Abuse*, *23*(1), 255-264.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American journal of preventive medicine*, *14*(4), 245-258.

Fernandez, E. (2008). Psychosocial wellbeing of children in care: A longitudinal study of outcomes. *Child Indicators Research*, *1*(3), 303-320.

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: a research note. *Journal of child psychology and psychiatry*, *38*(5), 581-586.

Goodman, R. (2001). Psychometric properties of the strengths and difficulties questionnaire. *Journal of the American Academy of Child & Adolescent Psychiatry*, *40*(11), 1337-1345.

Guttmann-Steinmetz, S., & Crowell, J. A. (2006). Attachment and externalizing disorders: A developmental psychopathology perspective. *Journal of the American Academy of Child & Adolescent Psychiatry*, *45*(4), 440-451.

Hiller, R. M., Fraser, A., Denne, M., Bauer, A., & Halligan, S. L. (2023). The development of young peoples' internalising and externalising difficulties over the first three-years in the public care system. *Child maltreatment*, *28*(1), 141-151.

Hillen, T., & Gafson, L. (2015). Why good placements matter: Pre-placement and placement risk factors associated with mental health disorders in pre-school children in foster care. *Clinical child psychology and psychiatry*, *20*(3), 486-499.

Hornor, G. (2019). Attachment disorders. *Journal of pediatric health care*, *33*(5), 612-622.

Liming, K. W., Akin, B., & Brook, J. (2021). Adverse childhood experiences and foster care placement stability. *Pediatrics*, *148*(6), e2021052700.

Lohr, W. D., & Jones, V. F. (2016). Mental health issues in foster care. *Pediatric annals*, *45*(10), e342-e348.

Maguire, D., May, K., McCormack, D., & Fosker, T. (2024). A Systematic Review of the Impact of Placement Instability on Emotional and Behavioural Outcomes Among Children in Foster Care. *Journal of Child & Adolescent Trauma*, 1-15.

McGuire, A., Cho, B., Huffhines, L., Gusler, S., Brown, S., & Jackson, Y. (2018). The relation between dimensions of maltreatment, placement instability, and mental health among youth in foster care. *Child Abuse & Neglect*, *86*, 10-21.

Miller, L., Randle, M., & Dolnicar, S. (2019). Carer factors associated with foster-placement success and breakdown. *The british journal of social work*, *49*(2), 503-522.

Mishra, A. A., Schwab-Reese, L. M., & Murfree, L. V. (2020). Adverse childhood experiences associated with children's patterns of out of home placement over time and subsequent negative outcomes during adolescence. In *Child & youth care forum* (Vol. 49, pp. 247-263). Springer US.

Minnis, H. (2023). Science into policy for the benefit of children: the Bucharest early intervention project. *American Journal of Psychiatry*, *180*(8), 528-529.

Minnis, H., Bryce, G., Phin, L., & Wilson, P. (2010). The "Spirit of New Orleans": translating a model of intervention with maltreated children and their families for the Glasgow context. *Clinical Child Psychology and Psychiatry*, *15*(4), 497-509.

National Collaborating Centre for Mental Health (UK. (2015). Children's attachment: attachment in children and young people who are adopted from care, in care or at high risk of going into care.

NICE guideline, Looked- after children and young people (2021) Accessed 2022 from: https://www.nice.org.uk/guidance/ng205

Oliveira, P., Barge, L., Stevens, E., Byford, S., Shearer, J., Spies, R., ... & Fearon, P. (2022). Children in foster care with symptoms of reactive attachment disorder: feasibility randomised controlled trial of a modified video-feedback parenting intervention. *BJPsych Open*, *8*(4), e134.

Prather, W., & Golden, J. A. (2009). A behavioral perspective of childhood trauma and attachment issues: Toward alternative treatment approaches for children with a history of abuse. *International Journal of Behavioral Consultation and Therapy*, *5*(1), 56.

Proctor, L. J., Skriner, L. C., Roesch, S., & Litrownik, A. J. (2010). Trajectories of behavioral adjustment following early placement in foster care: Predicting stability and change over 8 years. *Journal of the American Academy of Child & Adolescent Psychiatry*, *49*(5), 464-473.

Ribera, L. B., Longobardi, C., Prino, L. E., & Fabris, M. A. (2023). Secure attachment to mother and children's psychological adjustment: The mediating role of pet attachment. *Anthrozoös*, *36*(2), 279-293.

Román, M., Palacios, J., & Minnis, H. (2022). Changes in Attachment Disorder symptoms in children internationally adopted and in residential care. *Child abuse & neglect*, *130*, 105308.

Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling and more. Version 0.5-12 (BETA). Journal of Statistical Software, 48(2), 1–36.

Scottish Government (2023a) Children's social work statistics Scotland: 2021 to 2022. Edinburgh: Scottish Government. Accessed 2024 from: https://www.gov.scot/publications/childrens-social-work-statistics-scotland-2021-22/

Turner, M., Beckwith, H., Duschinsky, R., Forslund, T., Foster, S. L., Coughlan, B., ... & Carloe Schuengel, P. (2019). Attachment difficulties and disorders. *InnovAiT*, *12*(4), 173-179.

Vasileva, M., & Petermann, F. (2018). Attachment, development, and mental health in abused and neglected preschool children in foster care: A meta-analysis. *Trauma, Violence, & Abuse*, *19*(4), 443-458.

Vanschoonlandt, F., Vanderfaeillie, J., Van Holen, F., De Maeyer, S., & Robberechts, M. (2013). Externalizing problems in young foster children: Prevalence rates, predictors and service use. *Children and youth services review*, *35*(4), 716-724.

Yuan, K. H., & Bentler, P. M. (2000). 5. Three likelihood-based methods for mean and covariance structure analysis with nonnormal missing data. *Sociological methodology*, *30*(1), 165-200.

Zero to Three/National Center for Clinical Infant Programs, Arlington, VA. (1994). Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood. Diagnostic Classification: 0-3. ERIC Clearinghouse.

Appendices

Appendix A: *PRISMA Checklist*

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Page 8
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Page 9
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Pages 10-11
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 11
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Pages 11-12
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Page 12
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Page 12
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Pages 12-13
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Page 13
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Page 13
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Page 13
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Pages 13-14
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Pages 14-15
Synthesis	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and	Pages 14-

Section and Topic	Item #	Checklist item	Location where item is reported
methods		comparing against the planned groups for each synthesis (item #5)).	Page 15
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Pages 14-15
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Pages 14-15
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Pages 14-15
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Pages 14-15
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	N/A
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Page 14
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Page 14
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Page 16
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Page16
Study characteristics	17	Cite each included study and present its characteristics.	Pages 18-23
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Pages 25-26
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Pages 28-31
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Pages 24-26
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Pages 27-37
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Pages 27-37
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	N/A

Section and Topic	Item #	Checklist item	Location where item is reported
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Pages 27-37
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Pages 27-37
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Pages 37-40
	23b	Discuss any limitations of the evidence included in the review.	Page 39
	23c	Discuss any limitations of the review processes used.	Page 39
	23d	Discuss implications of the results for practice, policy, and future research.	Page 39
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Page 11
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Page 11
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	In protocol
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Page 40
Competing interests	26	Declare any competing interests of review authors.	Page 40
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Pages 75-84

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n7

Appendix B: *Supplementary Methods*

How effect sizes were transformed for the meta-analysis.

Hiller et al (2018) reported separate effect sizes for conduct and hyperactivity and therefore an average was taken to represent externalising difficulties, and for internalising difficulties an average of chronic and delayed internalising effect size was taken. Linares et al (2010) reported separate effects of hyperactivity and inattention, therefore an average was taken of the two to represent externalising difficulties. Mishra et al (2020), average was taken for delinquency and aggression. Proctor et al (2010) an average was taken for stable and increasing adjustment, stable disorder was removed from the analysis as it does not fit with the direction of the association being examined with the other groups. MacKenzie et al (2014) the sign was flipped because the association was with stability and not instability. For a number of longitudinal studies which report different effect sizes across different time points, a decision was made to use the effect size at latest follow up time (Strijker et al., 2008; Aarons et al., 2010) or the last wave of the data collection (Rosenthal at al, 2010).

Appendix C: *Table with Effect Sizes and Other Statistics Extracted from the Manuscripts*

Author and year	n	Type of analysis	How outcome was coded (continuous scale score or group)	Statistic	Effect size	p value	SE	CI	Covariates
Aarons et al., 2010	422	Multilevel cross-lag path analyses	**Continuous score**	β	Externalising Wave 3= .147 Wave 4= .06 Internalising Wave 3= .045 Wave 4= .093	Externalising Wave 3 p <.01 Wave 4 p > .05 Internalising Wave 3 p >.05 Wave 4 p >.05	N/A	N/A	Mental health problem
Asif et al., 2024	3156	Mixed effect modelling	**Groups** Clinical cut off used (scores in normal range were grouped as 'typical and scores not were considered 'atypical'.)	Average marginal effects of the binary logit regression model	Socio-emotional = − 0.012	p<.05	N/A	N/A	Gender, Aboriginal status of the child, type of harm experienced, type of placement, carer wellbeing and carer experiences
Barber and Delfabbro 2003	120	Repeated measures ANOVA	**Continuous** (means rather than total subscale score reported)	Significant mean differences expressed in standard deviation unit	Conduct (unstable group effect size= .46,.47, unstable-stable group effect size= .65,.37) Hyperactivity (unstable group effect size= n/a,	N/A	N/A	N/A	Social worker change

					unstable-stable group effect size= .44, .25) Emotionality- (unstable group effect size= .68,.64, unstable-stable group effect size= .56)				
Beck 2006	109	Not reported	**Groups** (unlikely, possible and probable psychiatric diagnosis)	Not reported	N/A	N/A	N/A	N/A	Age, gender, ethnicity, placed in borough, type of placement
Dumaret 1988	92	T test	**Continious** (average score on questionnaire)	T statistic (t statistic not reported)	Mean score 1 placement move= 6.3 2 and 3 placement moves = 8.7	p<.05	N/A	N/A	None

Hiller et al., 2023	460	Multinominal logistic regression	**Groups** (chronic, delayed, recovery and resilient group) <u>Descriptions</u> *resilient*= scores in normal range at all time points; *chronic*= scores in borderline abnormal range at all points; *delayed* = normal range at first but then borderline abnormal later; *recovery*= scores in borderline-abnormal range at first then in normal range at later time point).	B	Internalising Chronic group= 0.16 Delayed group= 0.04 Externalising Chronic = 0.16 Delayed= 0.04 Externalising (hyperactivity) Chronic= 0.13 Delayed= 0.17	p< .01 not significant, not reported p< .01 not significant, not reported p<.05 p<.05	0.06 0.07 0.08 1.59 0.06 0.08	95% CI 1.17 (1.04, 1.32) 1.04 (0.91, 1.20) 1.38 (1.18, 1.60) 1.13 (0.94, 1.36) 1.14(1.01, 1.28) 1.18(1.02, 1.37)	Age, ethnicity, missing person, sibling status.
Hiller and Clair 2018	207	Bivariate and point-biserial correlations	**Continuous** (total score on measure)	r	Emotion = .23 Peer = .30 Conduct = .37 Hyperactivity= .22	p <.05 p= <.01 p= <.01 p= <.01	N/A	N/A	Sibling-living arrangement
Hussey and Guo 2005	97	Hierarchical linear modelling analysis (HLM)	**Continuous** (total score on measure)	B	Total score= 1.10 Externalising= 1.12 Internalising= 0.95	p<.01 p<.01 p<.05	N/A	N/A	Time, rater teacher, male, African American, age at first DSMD rating, IQ, parent drug abuse, parent alcohol abuse, parent incarceration, parent

					Critical pathology=0.84	p<.05			mental illness, domestic violence, permanent custody
Lewis et al., 2007	102	ANCOVA	**Continuous** (T scores)	Eta-squared r	Oppositional behaviour (n^2 = .16). total difficulties= .21 internalising = -.01 externalising = .28	p<.01 p<.05 N/A p<.01	N/A	N/A	None
Linares et al., 2010	252	Multilevel (mixed) models	**Continuous**	β	Inattention Birth parent report = .15 Foster parent report = .007 Teacher report = -0.06 Hyperactivity Birth parent report = -0.00 Foster parent report = 0.23 Teacher report = -0.14	 p=.169 p=.578 p=.729 p=.973 p=.043 p=.364	 0.11 0.13 0.16 0.11 0.11 0.16	N/A	Adjusted for child age, gender, sibling risk, comorbidity, and use of stimulant medication
MacKenzie et al., 2014	116	Association	**Continuous** (T scores)	r	Internalising Years since last move = -.31 Years until next move= -.14 Externalising Years since last move = -.01	 p < .001 not reported not reported p<.05	N/A	N/A	None

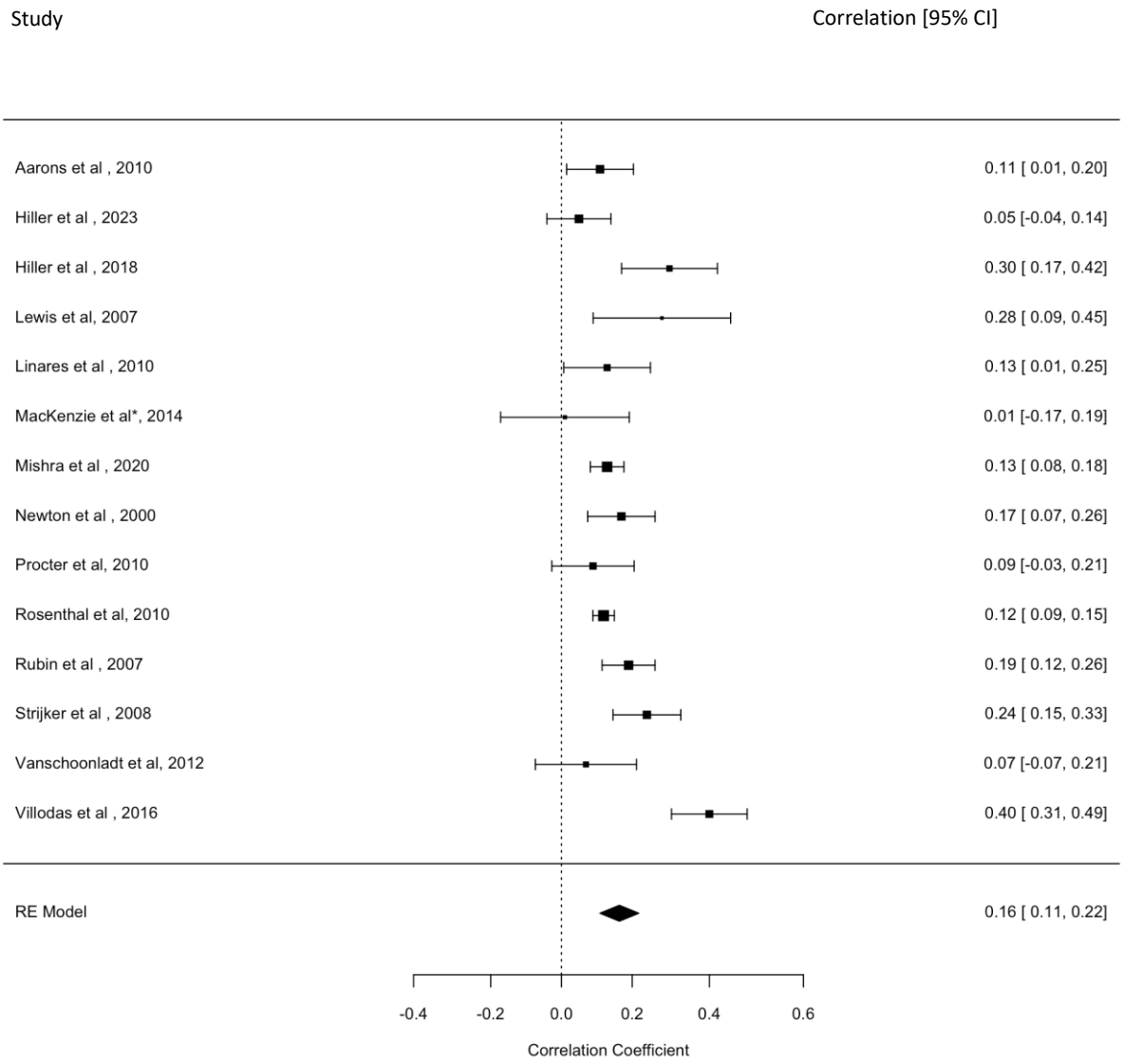
					Years until next move= -.20				
Mishra et al., 2020	1657	Multivariate Regression Model	**Continuous** (total scores)	B β	Depression b= 2.45, Beta= 0.10 Delinquency b=1.23, Beta= 0.09 Aggression b=2.19 , Beta= 0.07	p< 0.001 p=0.002 p=0.021	SE(b)=0.63 SE(b)=0.39 SE(b)=0.95	N/A	Age, sex, child race, parent education
Newton et al., 2000	415	Hierarchical Regression	**Continuous (**T scores)	β	Total difficulties= .101 Internalising: =.125, Externalising= .122,	p<.01 p<.01 p<.01	N/A	N/A	Sex, Age, T1 CBCL score
Proctor et al., 2010	279	Multinomial logit models – predictors of trajectory classes	**Groups** trajectory classes stable adjustment and increasing adjustment and stable disorder	OR	Internalising Stable adjustment OR= 1.44 Increasing adjustment OR=1.57 Externalising Stable adjustment OR= 1.47 Increasing adjustment OR=1.32 Stable disorder OR= 1.22	p<.01 not reported p<.05 not reported not reported	N/A	95% CI 1.06-1.95 0.90-2.73 1.05-2.05 0.75-2.34 0.82-1.72	Early cognitive ability, early social competence, frequency of early maltreatment, frequency of late maltreatment.

Rosenthal and Villegas 2010	4080	Longitudinal path model	**Continuous** (transformed into z scores)	β	Externalising Change: wave 1 to wave 3= 0.061 Change: wave 3 to wave 4 = 0.013 Change: wave 4 to wave 5= 0.067 Internalising Change: wave 1 to wave 3= 0.094 Change: wave 3 to wave 4 = 0.117 Change: wave 4 to wave 5= 0.092	 n/a n/a n/a p<0.05 p<0.05 n/a	N/A	N/A	Type of maltreatment, age, ethnicity and neglect and internalising and externalising score at previous time points
Rubin et al., 2008	1309	Multivariate ordinal logistic regression	**Groups** (normal and abnormal)	Standardised estimates of predictive margins derived from survey-weighted logistic regression	Adjusted probabilities Total difficulties at 36 months for children in unstable placements = 0.49 (standardised)	p= .007	N/A	95% CI 0.39-0.60	Adjusted for initial baseline behavioural assessments.
Rubin et al., 2007	671	Logistic regression	**Groups** (normal and abnormal)	OR	Externalising = 1.99	N/A	N/A	95% CI= 1.13-3.50	Adjusted for propensity score categories calculated based on: Child-level factors included the child's age, race, gender, history of chronic medical problems and baseline behavioural well-being. Birth parent characteristics; mental health problems, drug or alcohol use, history of domestic violence, or arrests. Child maltreatment characteristics; type of maltreatment, previous history of

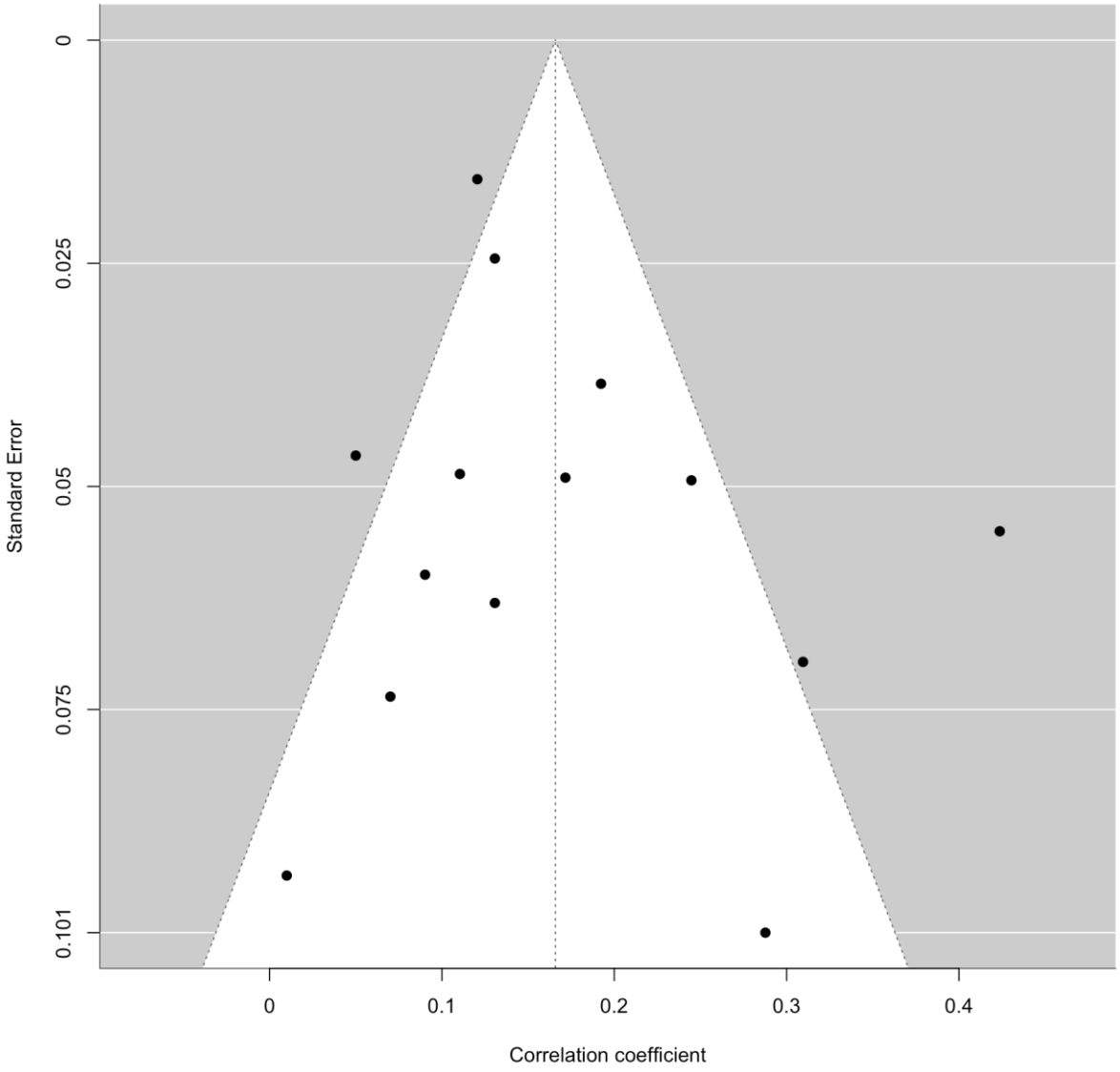
									investigations, substantiated reports, or out-of-home care.
Strijker et al., 2008	T1 415 T2 410	Association	**Continuous** (total sum of scores)	r	Externalising T1= .23 T2 .24	 p .0005 p .0005	N/A	N/A	None
Tarren-Sweeney	347	Hierarchical linear regression	**Continuous** (total sum of scores)	β	Total difficulties=-0.02		N/A	N/A	Age and age of removal into care
Vanschoonlandt et al., 2012	186	Logistic Regression backward likelihood ratio method	**Groups** (normal, borderline, abnormal)	OR	Internalising = 1.42 Externalising = 1.29 Total problems = 1.34	p=.01 p=.04 p=.02	.23 .12 .13	N/A	Unadjusted
Villodas et al., 2016	330	Logistic Regression	**Groups (**clinical and non-clinical)	OR	Externalising Compared with stable placements Caregiver report = 4.71 Youth report= 5.15 Compared with stable reunified placements = 6.28 Internalising Compared to stable placements Youth report=6.73 Compared with stable reunified placements = 7.47	 p= .004 p = .04 p = .03 p = .02 p = .02	N/A	95% CI 1.63 – 13.64 1.06, 28.51 1.21 – 32.58 1.33 – 33.98 1.48 – 37.79	Baseline externalising difficulties Baseline internalising difficulties

Appendix D: *Forest Plot and Funnel Plot from the Externalising Difficulties Meta-Analysis Before Influential Study was Removed.*

Forest plot

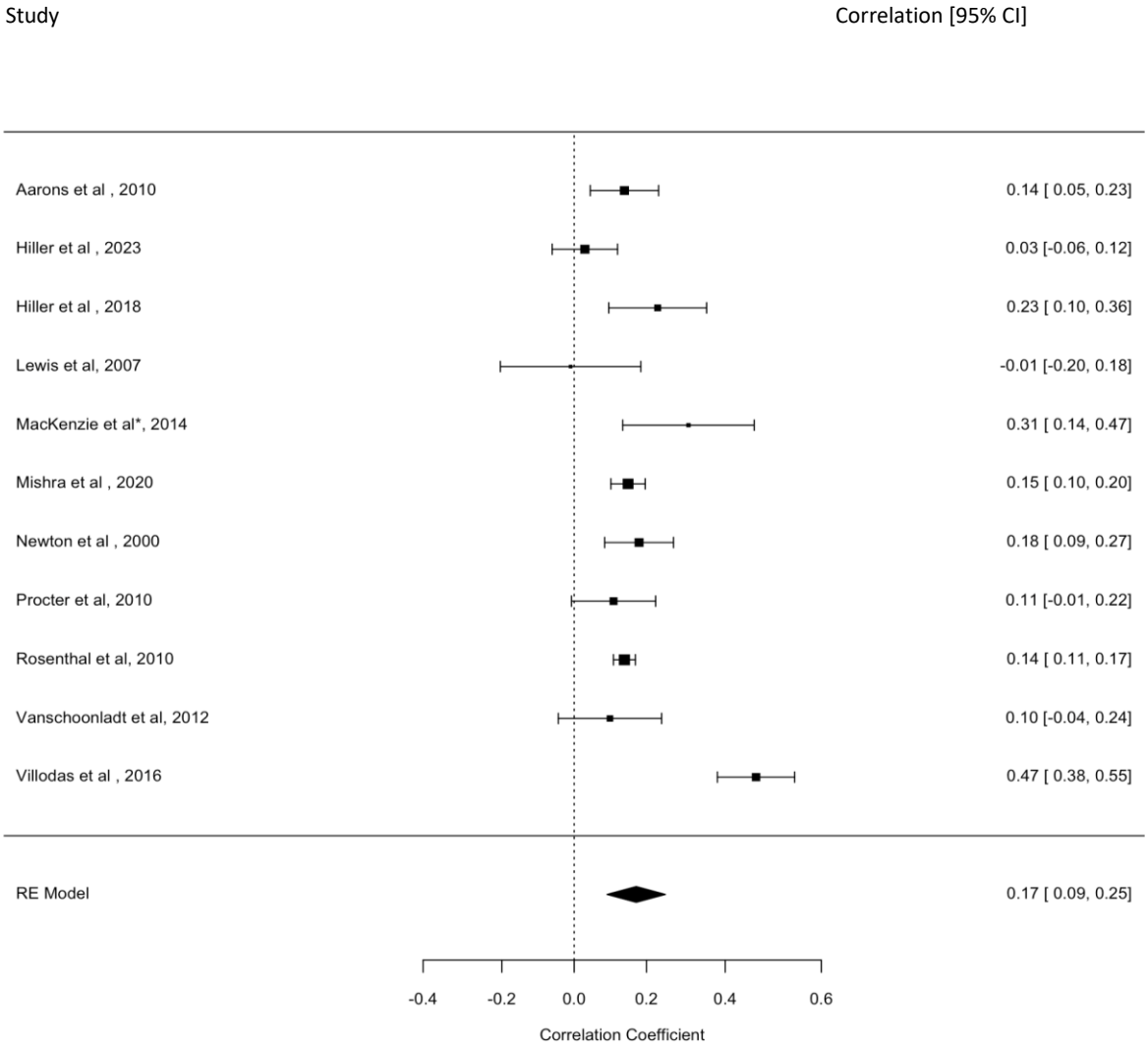


Funnel plot

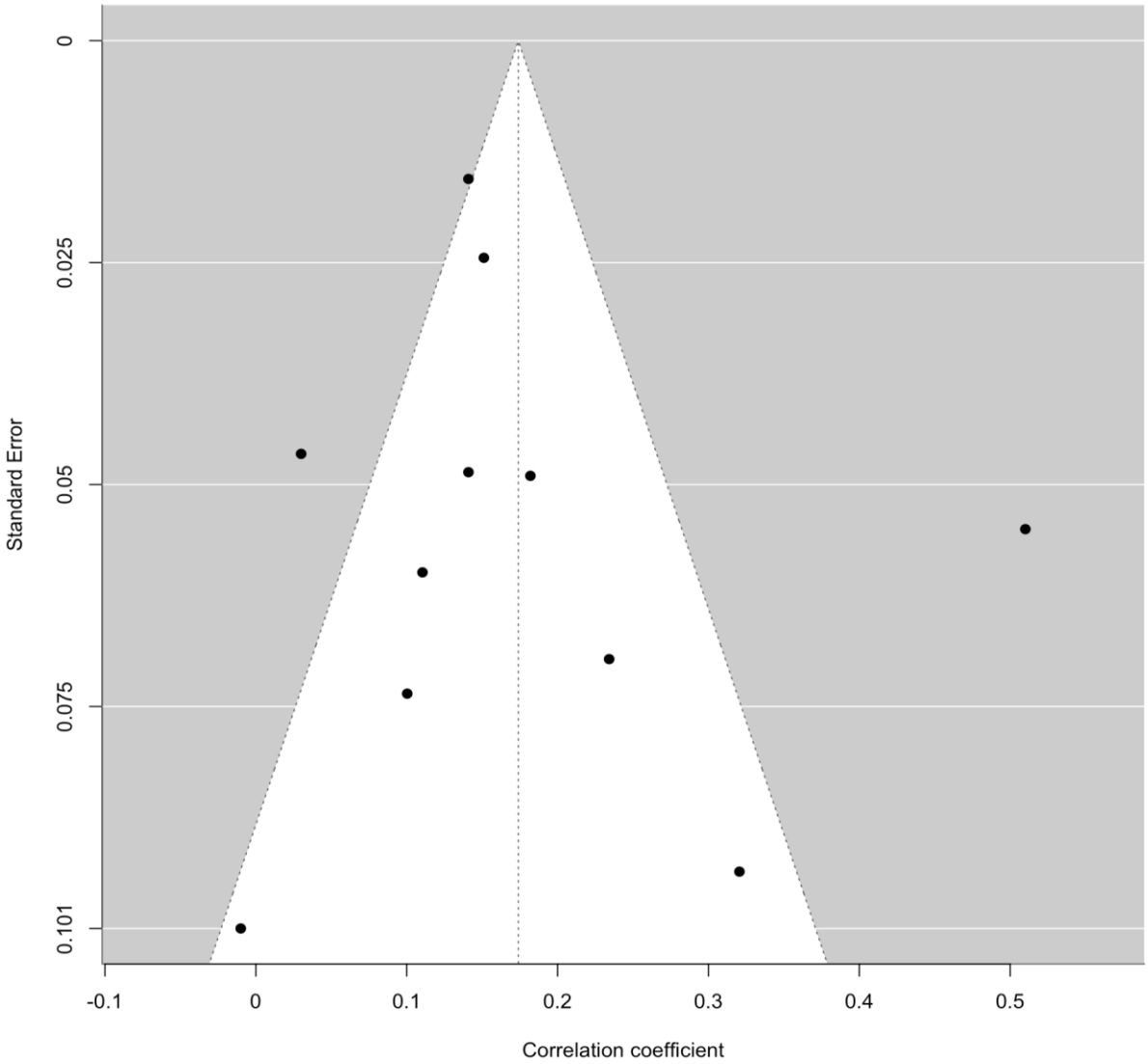

Standard Error
0
0.025
0.05
0.075
0.101
0
0.1
0.2
0.3
0.4
Correlation coefficient

Appendix E: *Forest plot and Funnel Plot from the Internalising Difficulties Meta-Analysis Before Influential Study was Removed*

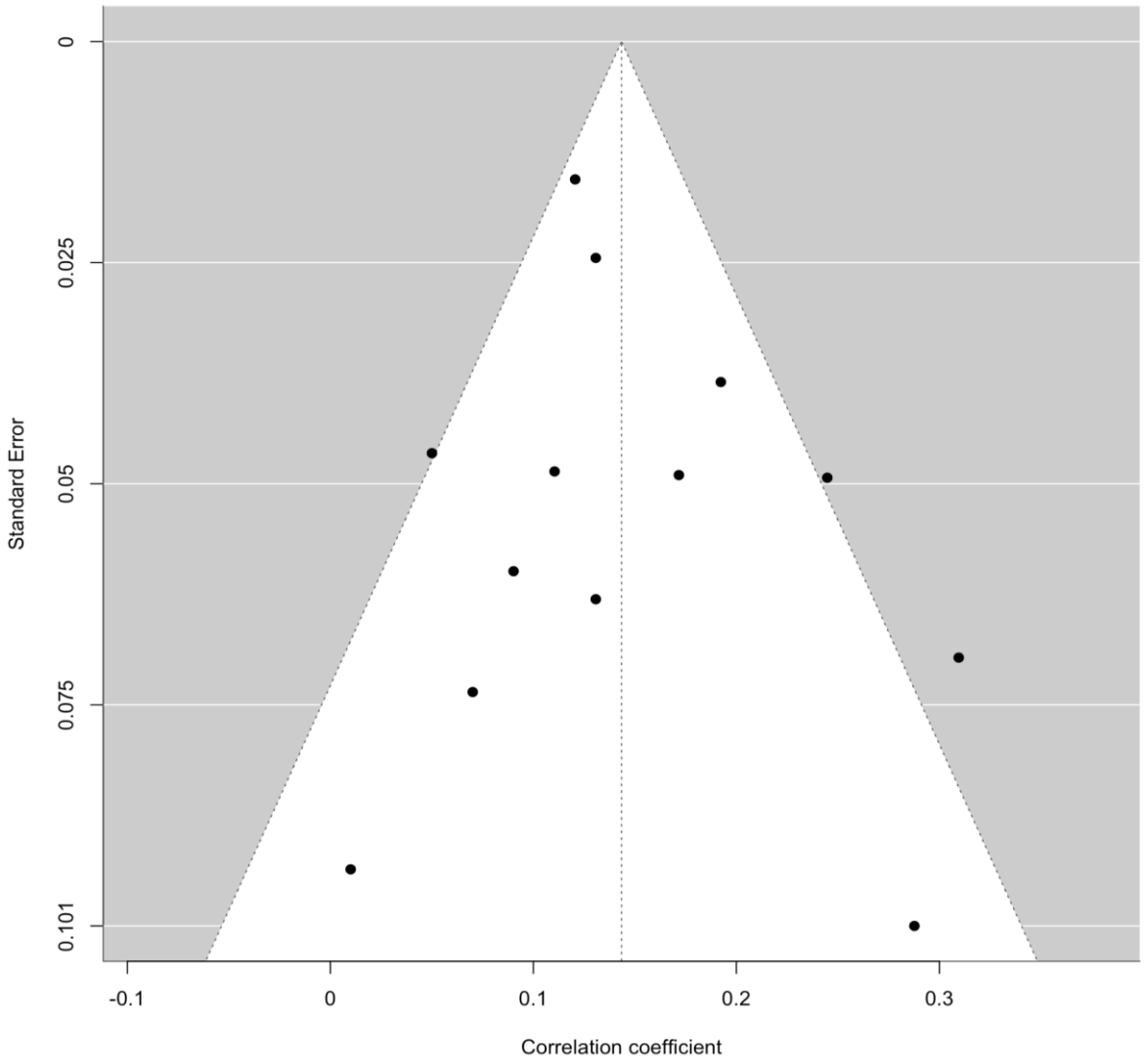
Forest plot



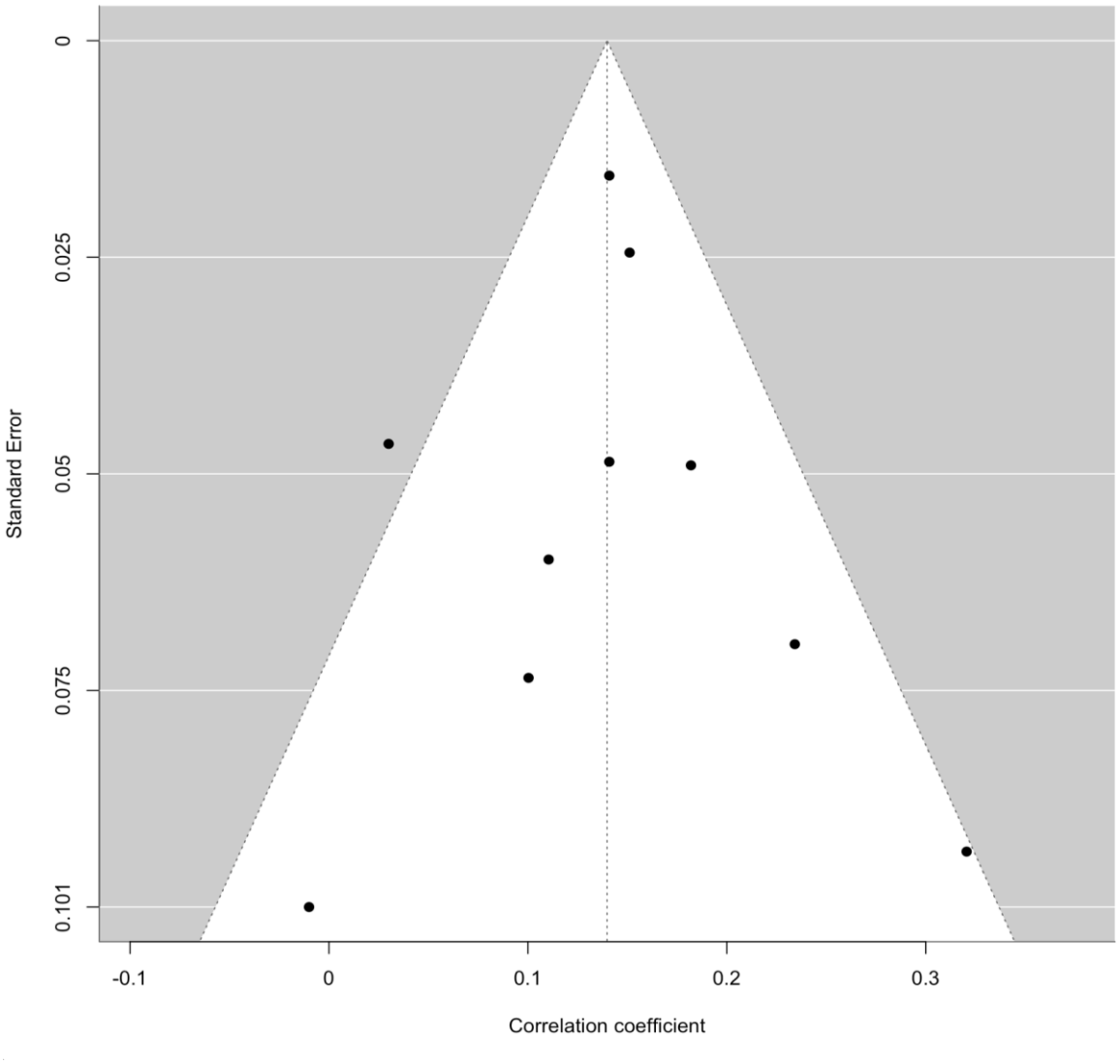
Funnel plot


Standard Error
0
0.025
0.05
0.075
0.101
-0.1
0
0.1
0.2
0.3
0.4
0.5
Correlation coefficient

Appendix F: *Funnel Plot for the Meta-Analysis on Externalising Difficulties*



Appendix G: *Funnel Plot for the Meta-Analysis on Internalising Difficulties*



Appendix H: *Final Approved Major Research Project Proposal*

Accessible from this link: https://osf.io/be3cz

Appendix I: *STROBE Checklist*

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	47
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	50
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	51-53
Objectives	3	State specific objectives, including any prespecified hypotheses	53-54
Methods			
Study design	4	Present key elements of study design early in the paper	54
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	54-55
Participants	6	Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	54-55
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	56-59
Data sources/ measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	56-59
Bias	9	Describe any efforts to address potential sources of bias	54-58

Study size	10	Explain how the study size was arrived at	58-59
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	58
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	58
		(*b*) Describe any methods used to examine subgroups and interactions	58
		(*c*) Explain how missing data were addressed	58
		If applicable, explain how loss to follow-up was addressed	58
		(*e*) Describe any sensitivity analyses	58
Results			
Participants	13	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	59-60
		(b) Give reasons for non-participation at each stage	54
		(c) Consider use of a flow diagram	N/A
Descriptive data	14	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	59-60
		(b) Indicate number of participants with missing data for each variable of interest	60
Outcome data	15	Report numbers of outcome events or summary measures over time	60
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	61-63
		(*b*) Report category boundaries when continuous variables were categorized	61-63
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	61-63

Discussion			
Key results	18	Summarise key results with reference to study objectives	64
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	66
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	64-66
Generalisability	21	Discuss the generalisability (external validity) of the study results	66
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	67

Appendix J: *PIR-GAS Sample Representativeness*

A comparison of demographics in those children with and without a PIRGAS visit time 1.

Variable	Statistic	Baseline PIRGAS completed	Baseline PIRGAS not completed
		All (N = 287)	**All (N = 177)**
Age at start of study (years)	N_{obs} (N_{miss})	287 (0)	177 (0)
	Mean (SD)	2.09 (1.65)	1.66 (1.64)
	Median (IQR)	1.93 [0.41, 3.41]	0.93 [0.16, 2.99]
	Range	(0.01, 5.46)	(0.02, 5.00)
Sex	N_{obs} (N_{miss})	287 (0)	172 (5)
Male	N (%)	150 (52.3%)	88 (51.2%)
Female	N (%)	137 (47.7%)	84 (48.8%)
SIMD (Decile)	N_{obs} (N_{miss})	272 (15)	137 (40)
1 - Most deprived	N (%)	171 (62.9%)	84 (61.3%)
Ethnicity‡	Nobs (Nmiss)	283 (4)	169 (3)
White	N (%)	235 (83.0%)	130 (76.9%)
Mixed	N (%)	24 (8.5%)	17 (10.1%)
Asian or Asian British	N (%)	12 (4.2%)	6 (3.6%)
Black or Black British	N (%)	12 (4.2%)	15 (8.9%)
Chinese or other ethnic group	N (%)	0 (0.0%)	1 (0.6%)
Care order	Nobs (Nmiss)	286 (1)	168 (4)
Voluntary	N (%)	123 (43.0%)	67 (39.9%)
Compulsory	N (%)	163 (57.0%)	101 (60.1%)
Number of previous placements‡	Nobs (Nmiss)	249 (38)	108 (64)
0	N (%)	213 (85.5%)	93 (86.1%)
1	N (%)	33 (13.3%)	14 (13.0%)
2	N (%)	3 (1.2%)	1 (0.9%)
SDQ-TD visit 1	Mean (SD)	12.6 (8.1)	13.1 (8.2)
SDQ-TD visit 2	Mean (SD)	11.8 (6.9)	12.7 (7.0)
SDQ -TD visit 3	Mean (SD)	11.2 (7.5)	11.4 (7.1)