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A systematic review of school performance and behavioural and emotional problems for adopted children.

Abstract

Education performance for children adopted from care is worthy of serious, comprehensive and robust investigation. Whilst there is a legal duty on Local Authorities in England and Wales to collate and monitor Looked After Children's (LAC) academic achievement and attainment, adopted children's educational progress is not specifically scrutinised. This systematic review addresses a gap in knowledge regarding the academic attainment and behavioural development of school-age children who have been adopted from care. A total of 15 published articles were selected for review, based on a stringent set of inclusion criteria. With one exception, adoption was associated with lower academic attainment and elevated levels of behavioural problems across childhood, adolescence and emerging adulthood compared with non-adopted comparison groups. Collectively, the findings suggest that the school performance of adopted children should be routinely monitored. The findings also point to a need to recognise the potential challenges faced by children adopted from care by working with families, schools, practitioners and researchers to identify the means through which children can achieve the best possible outcomes.

Keywords

Adoption, education, systematic review, academic attainment, school performance, behavioural problems, Looked After Children

Acronyms

LAC – Looked After Children; ICA – Inter-Country Adoption; CAP – Colorado Adoption Project; DfE – Department for Education

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Conflict of interests

The authors report no conflicts of interest.

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Introduction

The deleterious impact of adverse early life experiences on several areas of child development is well documented (Norman et al., 2012; Romano et al., 2015; Teicher and Samson, 2016). These include putative effects of early trauma (e.g. abuse, neglect, family stress, loss, inter-parental violence) on children's emotional, cognitive, behavioural and educational domains of functioning that are both persistent and enduring (Anda et al., 2006; Petrenko et al., 2012). For children who have been in the public care system, whether subsequently adopted, returned to the birth family or remained in care, numerous areas of concern have been highlighted, including difficulties with social relationships (Cooper and Johnson, 2007; Bruce et al., 2009), cognitive development (Beckett et al., 2006; Fry et al., 2016), emotional development (Dvir et al., 2014), participation in 'risky' behaviours (Wijedasa and Selwyn, 2011), poor educational achievement (O'Sullivan and Westerman, 2007; Vorria et al., 2015), and lower entrance to post-compulsory education (Jackson and Cameron, 2012; Jackson et al., 2015). Such concerns about children in, or exiting, care continue to receive international research attention (Palacios and Brodzinsky, 2010; Juffer et al., 2011; Christoffersen, 2012).

In a series of landmark articles, published just over a decade ago, van Ijzendoorn, Juffer and colleagues reviewed and synthesised data from a range of studies exploring aspects of development for adopted children (Juffer and van IJzendoorn, 2005; Juffer and van Ijzendoorn, 2007; van Ijzendoorn and Juffer, 2006). In 2005, van Ijzendoorn et al. (2005) conducted a series of meta-analyses using data drawn from 62 studies spanning North and South America, Europe and Australasia, representing a total of 17,767 adopted children. A wide range of school performance outcomes were scrutinised as part of the review including: school results, language problems, school failure, IQ and prevalence of special educational

needs. Results indicated that adopted children performed as well as peers on measures of IQ but less well in terms of school performance and language development. van Ijzendoorn and colleagues described this as an ‘adoption décalage’ (van Ijzendoorn et al., 2005: 312) or, the gap between competence (potential) and school performance (measured outcome). These findings suggest that the interplay between factors related to the social context of school and cognitive ability may be important for understanding outcomes for vulnerable young people.

What is striking about the content of van Ijzendoorn and colleagues’, as well as other reviews (e.g. Christoffersen, 2012; Fisher, 2015; Juffer et al., 2011), is the paucity of UK based studies. Whilst it is important to understand how political and cultural ideologies shape social work policy and practice across borders (Thoburn, 2009), it is equally important to appreciate the development and impact of policies and practice in the UK. Creating a family through adoption has continued to change substantially over the last 50 years (Cohen 2002). Currently, adoption is seen as solution for children whose birth family are unable or deemed unfit to provide an appropriate level of care (Mather 1999). Children for whom alternative care is sought are likely to have a range of complex needs.

Collectively, those UK studies that have been included in recent reviews (e.g. Tizard and Hodges, 1978; Beckett et al., 2006; Selwyn et al., 2006; Maughan et al., 1998; Triseliotis and Russell, 1984; Castle et al., 2000) have contributed greatly to the body of adoption knowledge, but education policy and practice in recent years has been particularly volatile and politically influenced. Because empirical enquiry is compelled, by definition, to respond and reflect dynamic contexts in order to remain relevant, regular reviews of current research pertaining to the needs of adopted children are necessary to place findings in context and inform current debates affecting adoption policy and practice.

A considerable amount of the extant literature on adopted children is based on US samples (e.g. Wadsworth et al., 2002; Bramlett and Radel, 2016; Brodzinsky, 2011). However, several European studies have emerged in recent years covering a wide range of adoption related matters, though much of this literature pays limited attention to education as a primary focus, instead concentrating on psycho-social development (e.g. Molina et al., 2015; Pace et al., 2014; Soares et al., 2017), policy implications (e.g. Rees and Selwyn, 2009), or solely sampling children placed through Inter-Country Adoption (ICA; e.g. van der Voort et al., 2014; Beckett et al., 2010).

It is well established that the poor school performance of children in out-of-home care is consistent, enduring and widespread (O'Higgins et al., 2015; Berridge, 2007; Liabo et al., 2013). In England, for the academic year 2014/2015, 91% of all pupils in Key Stage One (7 years old), achieved the expected level of progress in reading, 88% in writing and 93% in maths (DfE, 2016c). For LAC, this fell to 71%, 63% and 73% respectively. By the end of Key Stage Two (11 years old), 80% of non-LAC achieved the expected level in English and maths compared to 52% for LAC. This gap continues to persist at age 16 (end of Key Stage Four) where 53.2% of all pupils achieved the standard benchmark¹ in statutory tests, compared to 13.8% of LAC (DfE, 2016c). Further, very few young people (5%) from a care background go on to higher education, compared to 49% of the general school population (DfE, 2016b).

Whilst there is a legal duty for Local Authorities in England and Wales to collate and monitor Looked After Children's (LAC) academic attainment and achievement, these outcomes are not routinely scrutinised for adopted children. Thus, there is a major knowledge gap about the school performance outcomes of UK children domestically adopted from

¹ At the time the review was conducted the standard benchmark for achievement at Key Stage 4 was 5 GCSE passes at grades A*-C, including English and Maths (5A*-CEM).

public care (Howe, 2009). This is concerning because adopted children experience the same levels of pre-care adversity as LAC (Triseliotis, 2002), which may have implications for subsequent school performance, including behavioural adjustment and academic attainment.

Recently available, albeit partial, data (estimated 66% of adopted pupils at 11 years old and 30% at 16 years old) have shed some light on the relative attainment of adopted children in England (DfE, 2016c). The annual school census (known as PLASC²) is returned by schools to the Department for Education (DfE) and contains various demographic and attainment data as well as an option for parents to ‘flag’ children as adopted, in order to release additional school level funding known as ‘pupil premium plus’. Whilst the data show that adoptees perform marginally better than LAC, a substantial gap appears to exist between the general pupil population and adoptees when achievement of expected levels of attainment is considered. This gap is evident at both age 11 (80% general population and 68% adoptees) and 16 (53% general population and 23% adoptees) (DfE, 2016c).

Though these figures are based on incomplete data it does at least suggest that detailed, thorough and reliable investigation of school performance outcomes for children adopted from public care is justified. In the absence of complete, centrally collated quantitative data, attention turns to the empirical body of literature to identify what is currently known about adopted children’s school performance. In order to extend previous research, only studies published since the review conducted by van Ijzendoorn and colleagues (van Ijzendoorn et al., 2005) were included in the analysis. We had two research aims:

1. To establish domestic adoptees’ educational performance in the empirical literature.
2. To review the psychological health, in terms of behavioural outcomes, of domestic adoptees as reported in the empirical literature.

² Pupil Level Annual School Census

Method

This review sought to address these aims by synthesizing results of studies that have investigated school performance outcomes for domestically adopted children, that is, children adopted from out-of-home care within their country of origin. It was thought that whilst pre-adoption experiences of internationally and domestically adopted children bear some similarities, the differences may confound interpretation of outcomes. In addition, there is scant literature that focusses solely on domestic adoption in the UK.

In the absence of a standardised, generic measure of school performance and in line with previous reviews, we adopted a broad definition to encompass not only academic attainment as measured by summative assessment (e.g. national tests, school tests, teacher assessment) but also ratings of performance/ competence by pupils, parents and teachers and other indicators of success at school (e.g. attendance rates). To increase quality through transparency and standardisation in the reporting of systematic reviews, the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-analysis) statement was developed (Liberati et al., 2009). PRISMA was used as a framework for the present review.

In all, seventeen electronic databases of journal articles and conference papers were searched in the last week of February 2016. The following terms were used to search all registers and databases: "adopted children/ pupil" OR "adopted from care" AND adopt* AND school* OR educat* AND perform* OR achieve* OR attain* OR "academic attainment/ achievement/ outcome OR "educational attainment/ achievement outcome" OR competen* OR "competence" OR "learning" OR learn*. Some minor adjustments were required depending on the level of detail the database interface would allow. To further capture research that addressed the aims of the present review, a search of prominent authors in the field was also conducted (Boland et al., 2013) in both the published and grey databases.

In addition, the contents of relevant journals (Adoption & Fostering, Adoption Quarterly, Child & Adolescent Mental Health; Child & Family Studies, Children & Youth Services Review, Journal of Child Psychology & Psychiatry) were searched to counter database registration errors (Liberati et al., 2009) and reference lists of included studies were also examined. Prominent authors in the field were consulted via email with regard to ongoing or recently submitted research not yet appearing on databases. Many of the larger databases enable an update function where the search strategy is saved and re-run automatically at a user determined frequency; this update function was selected at weekly intervals for the NCBI, OVID and PROQUEST databases until the week before the manuscript was submitted for peer review (27/02/2017). A full strategy and list of authors searched is available from the first author.

Studies were included in this review if: (a) the participants were domestically adopted and of school age; (b) IQ was assessed using a standardised scale, and/or an indication of school performance was recorded and/or levels of behavioural problems in school were determined; (c) a non-adopted comparison group was included (this may have been a group from the general population or a group of children in the care system), or a norm-referenced test was used; (d) quantifiable outcomes of assessments were reported – this was more straightforward for the IQ tests and behavioural measures, but for school performance this could include grades, attendance rates, grade retention (repeating a year) or scores from teacher or parent reported measures and (e) the study design was primary research, a cohort study or secondary analysis of a large data set.

Studies that did not meet these criteria were excluded, particularly if the sample was comprised exclusively of LAC, ICA, or a mixed sample was used where more than 50% of children were not domestically adopted. To reduce the risk of bias, the effect of further confounds were limited by the exclusion of studies that reported on: adoption by other family

members (e.g. kinship adoption, adoption of step children); children who had been, or were in the process of, clinical referral; reports of therapeutic interventions; qualitative studies; single case reports; and literature reviews

To establish the level of rigor and relevance for each included study a modified version of the Newcastle-Ottawa Quality Assessment Scale (NOS, Wells et al., 2012) was used. Two researchers carried out the quality assessment process independently and agreed on 85% of judgments; differences were resolved by discussion until consensus was reached.

Results

The search yielded 11,569 articles and, after duplicates were removed, 9649 articles were screened by title and abstract for eligibility. Consequently, 237 articles were subjected to full text scrutiny. Excluded articles were grouped according to reasons for omission. A total of 15 articles were selected for review. Figure 1 details the screening and selection process.

INSERT FIGURE 1 ABOUT HERE

Only five studies (Bramlett, 2011; Raleigh and Kao, 2013; Thomas, 2016; Vinnerljung and Hjern, 2011; McClelland et al., 2013) explored education as the primary variable of interest and all but four (Lewis et al., 2007; Howard et al., 2004; Sanchez-Sandoval and Palacios, 2012; Weinberg et al., 2004) used existing longitudinal datasets or national registers (Vinnerljung and Hjern, 2011). A variety of measures were used to assess each area of interest from established, standardised assessments to parent or pupil reports. Most studies used children in the early adolescent (10-14)/ late adolescent (15-18) age range (Arnett and Hughes, 2012). Studies were either conducted in the US (n=12) or Europe (n=3). Whilst a US bias is to be expected given the relative volume of adoptions, the overall number of included studies is surprisingly small both in and outside of the US.

Sample sizes varied substantially across studies, partly because several made use of national registers or large cohort datasets. Sample sizes for adopted children ranged between 31 and 41,189. Comparison group size ranged between 27 and 1,287,856. The upper values for each group originate from the same study (Thomas, 2016) and the precise definition of adoption used is unclear. This is potentially confounding as it may refer to a variety of adoption types outside the remit of this review; the importance of distinguishing between type of adoption when analysing outcome data has been demonstrated by (Bramlett, 2011). The ages of the children included in the studies also varied. Whereas all studies were able to report the age at assessment (4.4 years to 19 years), five were unable to report the age at adoption. This was either as a consequence of secondary analysis of datasets that did not seek to address issues surrounding adoption as its primary focus, official records were incomplete or inconclusive, or respondents were children who may not be able to provide a precise report of age of adoption. Studies assessing at the upper age range asked respondents to recall school experiences. Range of reported age at adoption was between 29 days and 17 years.

Of the 15 included studies published since 2003 over half ($n=11$) were secondary analysis of longitudinal cohort studies or used pooled data from the Colorado Adoption Project (CAP; Plomin and DeFries, 1983; DeFries et al., 1994; Plomin et al., 2006; Rhea et al., 2013), four were primary research and one used national registers. Most comparison groups were formed from a non-adopted sample from the general population, in the case of secondary analysis of large cohort studies these were from the remaining study participants and mostly unmatched.

In terms of domains, only one examined IQ, 12 scrutinised school performance and seven explored behavioural outcomes. One study (Lewis et al., 2007) investigated both IQ and behavioural outcomes, a further four studies (Howard et al., 2004; Zill and Bramlett, 2014; Lloyd and Barth, 2011; Weinberg et al., 2004) examined both school performance and

behavioural outcomes. Key characteristics for each study can be found in Table 1 and are summarised below. Overall, the studies revealed the general use of validated, standardised measures for assessing IQ and behavioural problems, but non-validated measures to give an indication of school performance. This may reflect the absence of an established, validated and standardised measure of school performance or a lack of consensus about what is fundamental to this construct.

INSERT TABLE 1 ABOUT HERE

The outlook for adopted children in terms of school IQ and school performance, as reported in the included studies, was overwhelmingly less favourable than the general population. However, when comparisons with children in public care were made, adopted children tended to fare better; this was true across the sampled age range and the measures used.

Outcomes for adopted children's behavioural and emotional problems were as expected, insofar as none of the seven included studies reported more favourable outcomes for adopted children than the comparison group. These findings are summarised in Table 2. Using a range of measures, five studies (Howard et al., 2004; Lewis et al., 2007; Sanchez-Sandoval and Palacios, 2012; Zill and Bramlett, 2014; Weinberg et al., 2004) demonstrated more behavioural problems for adopted children than the non-adopted comparison groups whilst the remaining two (Lloyd and Barth, 2011; Nilsson et al., 2011) reported no significant differences, though the comparison groups were heterogeneous.

INSERT TABLE 2 ABOUT HERE

Whilst no discernible causal pattern is apparent, it seems that, when compared to non-adopted children, domestically adopted children are prone to develop more behavioural

problems of a nature that may impede progress at school, or make successful outcomes challenging to attain.

Discussion

This systematic review aimed to establish domestic adoptees' school performance outcomes in terms of IQ, academic performance and behavioural and emotional problems by synthesising evidence from the recent empirical body of adoption literature. A comprehensive search strategy yielded 15 studies that met specific search criteria.

Most ($n=12$) of the studies in the present review did not report pre-placement experiences such as age at adoption, adversity or number of pre-adoptive placements. The nature, scale and timing of pre-placement experiences is likely to have been highly variable both within and between samples. The absence of reporting for these theoretically important background variables is attributable to several factors including: the study availed itself of secondary analysis of longitudinal cohort studies (e.g. Wijedasa and Selwyn, 2011), surveys (e.g. Thomas, 2016; Bramlett, 2011) or national databases (e.g. Vinnerljung and Hjern, 2011); the exploration of adoption-related issues were not the primary research focus, or pre-placement adversity was not measured or included as a covariate as part of the analytic approach. There is overwhelming evidence (e.g. Soares et al., 2017; Nadeem et al., 2016; Palacios et al., 2011; Rushton and Dance, 2006) that pre-adoption experiences are important factors when attempting to understand the impact of early trauma on development. It is unclear from the included studies, however, how these indices of adversity contributed to the outcomes of interest. Three studies used participants from the Colorado Adoption Project where infants were relinquished at birth and placed in foster care for an average 29 days until adoption, thus potentially limiting effects of pre-placement adversity (Harwood et al., 2013). Three studies (Lewis et al., 2007; Howard et al., 2004; Lloyd and Barth, 2011) were able to

report on levels of pre-placement adversity and these were comparable to recent figures for LAC in England (DfE, 2016a).

The included studies that did include pre-placement adversity in their analysis were able to do so because the study was of a primary research design whereby sampling and data collection methods were specifically chosen to address this. Data from the National Survey of Child and Adolescent Wellbeing (NSCAW – a federally funded study monitoring children’s pathways through child welfare services) explored by (Lloyd and Barth, 2011) included levels of pre-placement adversity as the sample were drawn from children in foster care who were then later placed for adoption. Whilst the adoptees scored significantly higher on a test of educational outcomes than children in foster care, both groups scored close to the mean.

Despite an ongoing interest in the use of adoption as a means to secure permanence for vulnerable children (DfE, 2016a; DfE, 2016c), the overall number of included studies was low. This may reflect an underlying underestimation regarding the effects of early trauma for children adopted from care. This is particularly concerning for the UK, as only one UK study with a small sample of adopted children met the inclusion criteria. Of the 222 studies that were excluded, only 10% were from the UK (US – 53%; Europe – 18.6%; other – 18.6%); this further substantiates the claim made here and elsewhere (e.g. Howe et al., 2009) that research into processes and outcomes for domestically adopted children in the UK is notable by its scarcity. Confidence in the assumption that all relevant research was included in this review and that the conclusions are grounded in all available evidence comes from the comprehensive, continually updated search strategy that addressed issues of bias, and the quality assessment process.

Previous research has indicated that performance on IQ tasks for adopted children is generally better than for non-adopted birth siblings and LAC, but on a par with the general

population (van Ijzendoorn et al., 2005; Juffer et al., 2009). Lewis et al. (2007), however, found that adopted children scored significantly lower than the general population comparison group, but mean scores for all groups were within one standard deviation of the standardised mean. The results suggest that while the IQ scores of adopted and non-adopted groups differ, the differences are slight when compared to the general population. Lewis et al. (2007) reported considerable levels of adversity as reasons for entry into care and placement instability, which may partially explain this finding. The modest sample size and the non-matched, opportunity sampling of the comparison group also suggests a cautious interpretation is needed. These differences may manifest in the test scores because higher levels of privation have been previously reported to affect outcomes (e.g. Julian, 2013).

The inclusion of only one study investigating IQ was an unexpected outcome for this review – almost half of the included studies in the van Ijzendoorn et al. (2005) review used a measure of IQ. An explanation for this may be in the longer selection window but also may reflect shifting trends in adoption research whereby the field has moved from identifying differences in psychological and cognitive adjustment, to understanding processes and the role of contextual factors (Palacios and Brodzinsky, 2010).

In terms of school performance, adopted children fared less well, or similarly to, non-adopted comparison groups from the general population; however, compared to LAC, adopted children performed better. Of the 12 studies that examined school performance, none reported adopted children performing better than non-adopted, general population comparison groups. This is consistent with much of the adoption research to date (e.g. van Ijzendoorn et al., 2005; Vorria et al., 2015; Scheeren et al., 2017).

In contrast, (Wijedasa and Selwyn, 2011) found outcomes for adopted children to be more in line with their non-adopted peers. Details of attainment during adolescence were

analysed by linking data from the Longitudinal Study of Young People in England (LSYPE) with the National Pupil Database (UK). Data linkage is a significant strength of this study as reliable data for academic attainment could be analysed that were not included in the original wave of data collection. At Key Stage Three (UK Year 9, aged 13/14), adopted children outperformed all other groups on national tests in terms of expected progress. For GCSE, 55% of adopted children achieved 5 or more passes at grades A*-C. This was similar to pupils from the general population group (60%) and twice as high as that for LAC (27%). These results are contrary to the centrally released statistics described above (DfE, 2016a) and outcomes from studies included in this review. As the authors note, explanations may lie in the representativeness of the adopted group, particularly when considering the modest sample size (n=31) and rate of sample attrition.

In the absence of an established, standardised measure of school performance, a wide range of measures to capture academic attainment for adopted children was used. This heterogeneity made direct comparisons between studies challenging. Nonetheless, it is clear from the evidence presented in this review that adopted children are less successful in their performance in school. This appears to hold true whether school performance outcomes are established through testing, analysis of national registers or perceptions of performance as reported by teachers, parents and pupils. The 'adoption decalage' described by van Ijzendoorn et al. (2005) may also account for the differences in school performance found here. Without additional measurement of IQ in these studies, this explanation remains tentative.

The relatively small sample sizes commonly found in adoption research is an oft-cited criticism of this field of research (Miller et al., 2005; Palacios and Brodzinsky, 2010). One advantage of synthesising data through systematic review is that conclusions may be drawn from a large number of participants. This was the case here, as adopted children assessed for

school performance numbered 47,925 across 12 studies (Table 2). This reflects the research designs whereby all but one study was based on large scale surveys or national datasets. Using data from national surveys does, however, raise methodological issues; in particular, the original question stimuli may not directly reflect the aims of the secondary analysis, and there is less control over sampling of participants and the accuracy of responses (Miller et al., 2005). This issue was highlighted in the exploration of adolescent adjustment by Burrow et al (2004) where average school grades of 420 adopted adolescents were compared with 8536 non-adopted peers using data from the National Longitudinal Study of Adolescent Health (AddHealth). The adopted group appeared to fare less well, with lower grades than the comparison group, more learning problems and lower levels of school connectedness. Caution, however, should be taken with conclusions drawn from the AddHealth data as Fan et al. (2002) demonstrated inconsistencies with participant responses, particularly in disclosure of adoption (some adolescents reported they were adopted when they were not and exaggerated incidences of delinquent behaviour). Likewise, academic grades were self-reported by the respondents but not verified, rather than being collected from high school transcripts (which occurred in subsequent waves of Add Health data collection).

Previous research (e.g. Radel et al., 2010; Vandivere and McKlindon, 2010) has shown an effect of type of adoption (i.e. from foster care, private, intercountry or kinship care) on measured outcomes and this was supported by Bramlett (2011) in his analysis of data from the National Survey of Adopted Parents (NSAP), where the distinction between adoption types was used to further delineate school performance. In this case, all adopted children were less likely to be rated as excellent for reading and maths and more likely to be rated as fair/ poor in these subjects when compared to all children. Further analysis revealed that much of this difference was accounted for by children adopted from public care; they received lower ratings for both subjects than all children and children adopted privately or

internationally. Although private adoption is particular to US adoption policy and practice, this at least suggests that differences in type of adoption give rise to different perceptions of ability and the impact of pre-adoption experiences, thus requiring future research to take adoption type into account.

Focussing on reading and maths scores as an indication of school performance, Raleigh and Kao (2013) found, as an aggregate group, adopted children scored lower on tests of maths and reading. A significant difference was only observed when variance (gender, race, ethnic background and identified special educational need) within adopted families was accounted for. Data was taken from the Early Childhood Longitudinal Study (ECLS-K), a large, representative, US based population study. Stratifying groups in this way clarifies how variation within adoptive families can affect interpretation of outcomes.

Analysing data from a later iteration of the NSCH, Zill and Bramlett (2014) compared life-circumstances and well-being of adopted children, children in care and children of never married, single mothers to children living with two biological parents. As in Bramlett (2011), parents reported on measures of school performance including questions about school engagement and grade retention. After adjusting for demographic, parental education and income, adoptees were significantly less engaged in schoolwork and were three times more likely to repeat a grade than non-adopted children; no differences between adoptees and LAC were found. As with all studies that explored rates of grade retention, adopted children were more likely to repeat a year than the general population. While grade retention is peculiar to the US education system and makes cross-country comparisons of school performance difficult these findings add to the evidence that adopted children perform at lower levels than expected.

The pattern of evidence from studies that explored levels of behavioural and emotional problems were similar to those of academic attainment in that adopted children fared less well when compared to non-adopted children but marginally better than LAC. The evidence presented here for elevated levels of behavioural and emotional problems in adopted children corroborate findings from several recent studies (e.g. Juffer and van IJzendoorn, 2005; van IJzendoorn and Juffer, 2006; Verhulst et al., 1990). Though much of these concentrated on ICA, this systematic review provides evidence that this is likely to be the case for domestically adopted children also.

Links between poor school performance and high levels of behaviour problems are well established and stable throughout the school age. For example, in a meta-analysis of 25 studies exploring academic performance of children with Emotional/ Behavioural Disturbance (EBD), Reid et al. (2004), found a moderate to large difference when compared to age-matched peers without disabilities. Similarly, Nelson et al. (2004) concluded that children with EBD experienced large academic deficits across the 5-16 age range. This review (and others e.g. Keyes et al., 2008; Vandivere and McKlindon, 2010), points to an increased probability of elevated levels of behavioural and emotional problems in adopted children, the manifestation of which is likely to be detrimental to succeeding in a mainstream school environment. It follows that this may partly explain under-achievement of adopted children in school though more work on the direction of effects is needed.

In comparing behaviour of adopted and non-adopted children, Sanchez-Sandoval and Palacios (2012) used the Revised Rutter Teacher Scale (Hogg et al., 1997). Compared to current classmates, adopted children had higher levels of emotional and behavioural problems. Further analysis of the interaction between gender and group revealed that considerably larger adoption effect sizes for boys were seen in emotional problems; this accounted for most of the differences in male adjustment (Sanchez-Sandoval and Palacios,

2012). For behavioural and inattention/ over-activity problems, larger effect sizes were seen for girls than boys when compared to current classmates, leading these authors to concur with others (i.e. Bricker et al., 2006; Iervolino, 2003; Nilsson et al., 2011), in suggesting a disproportionate adoption effect for gender. Further investigation is warranted, however, as this is contrary to research with LAC (e.g. Newton et al., 2000) and the cited supporting evidence used the same sample from the CAP. Consistent with the other included studies, when compared to children in residential foster care, adopted children showed fewer problems, especially in primary education. This difference is suggestive of adoption being a more favourable option than public care, at least in terms of behavioural adjustment.

Older age at adoption has been widely shown to be an important factor in development of later problems (e.g. Sharma et al., 1998; Gunnar and Van Dulmen, 2007). In order to control for this effect, Nilsson et al. (2011) analysed behaviour outcomes in the CAP sample where the mean age at adoption was 29 days. Assessment was carried out at age 17 through the DISC. No significant differences in the number of DSM-IV symptoms between adopted and non-adopted children were found. There was, however, an effect of gender in that female adoptees showed more DSM-IV symptoms than female non-adoptees but no significant differences between adopted and non-adopted males were found.

Four included studies (Howard et al., 2004; Lloyd and Barth, 2011; Zill and Bramlett, 2014; Weinberg et al., 2004) examined both school performance and behavioural problems in their respective samples. In the Howard et al. (2004) study children adopted from care not only had significantly higher rates of repeating a year and lower grades than all other groups (non-adopted, ICA and infant adoption) but also had more instances of complaints made by teachers on grounds of behaviour. Whilst it is difficult to disentangle these associations at an individual level, a tentative explanation may be made by taking into account that adoptive parents were more likely than parents of birth children to report un-met educational needs.

A similar pattern is evident in the Zill and Bramlett (2014) analysis, where adopted children were more likely than children living with two biological parents to be diagnosed with ADHD or conduct disorder and to display less engagement in school. Also, in Howard et al. (2004) above, adoptive parents received more complaints from teachers about children's behaviour than non-adoptive parents. Results from Weinberg et al. (2004) are unclear on this issue because the scales were collapsed to aid analysis. Children identified as having a 'school problem' may have faced varying challenges. Findings from Lloyd and Barth (2011) are also inconclusive as adopted children outperformed LAC in reading and maths tests but all groups had similar scores on behavioural measures; in addition there was no non-adopted comparison group. Age at assessment was 66 months and this may be developmentally too early to identify striking differences.

Limitations

The findings of this review concur with previous analyses of adopted children's school performance, but some limitations are noted. The inclusion criteria were necessarily rigorous to meet the study aims and conceptual definitions; doing so, however, may render the systematic review less useful when the area under examination has attracted little specific research, though this was not the impression from the initial scoping search. The heterogeneity in sampling and measurement made direct comparisons challenging. Many of the included studies were based on archival analysis of existing datasets. Whilst this may be advantageous in some respects (i.e. increased sample size, representativeness of target groups and availability of longitudinal data), it is balanced by restrictions of the original survey questions. Miller et al. (2005) identified several areas of particular concern including verification of adoption status and type. In addition, as was the case with several of the included studies in the present review, the original surveys were not designed to investigate adoption or education as a primary focus. Substantive questions were therefore ambiguous

and often relied on subjective accounts of performance or diagnosis from parents and, occasionally, children. Further, through synthesising outcomes from a number of large scale surveys, a wide age range at both adoption and assessment was identified. This is problematic because it is difficult to disentangle stages of development from impact of adoption. While the large sample sizes can be advantageous, it can also be a drawback if the primary focus is not adoption. It is left to chance how many adopted children are captured in the sampling, further limiting the extent of generalisations. This suggests that secondary analysis of large cohort studies requires going beyond counting and grouping to make more meaningful use of the data available: this could potentially be achieved through collaboration with population survey designers to include relevant questions specifically addressing adoption-related issues. Finally, in an attempt to isolate the impact of adoption, this review excluded studies that had only sampled children who received additional support in school because of an identified Special Educational Need. Given that adopted children are more likely to fall into this category (Berridge, 2009), their absence may constrain generalisability.

Implications for practice and future research

Collectively, the studies included in this review reveal lower school performance for adopted children when compared to non-adopted peers. These findings support the argument that quantitative data be collected and monitored for adopted children's school performance in relation to both attainment and adjustment in order to establish a robust picture for this vulnerable group of children. This review also raises a number of questions that warrant further scrutiny: (1) What mechanisms underpin the apparent gap in school performance between adoptees and non-adopted children? (2) Are identified differences uniform over the course of formal education? (3) How can adoption research inform education policy and practice to enable adoptees to achieve the best possible outcomes? (4) What current

mechanisms for support (e.g. adoptive parents, Adoption Support Fund, Virtual School Heads) are most effective for adopted children?

The recognition by the UK Government (DfE, 2016), of similarity between LAC and adopted children, highlights a growing understanding that educational needs are unlikely to change significantly simply because children's care status has changed. In a bid to address the achievement gap, a variety of policy changes have been implemented since 2014 to raise the attainment of disadvantaged and vulnerable pupils (Higgins et al., 2016). For example, entitlements, such as the pupil premium in England, have been extended to include those children no longer in the care system, including those children who have been adopted. Future research should empirically evaluate the effectiveness of these initiatives.

Conclusion

Education systems are overlooking a vulnerable group of children who may be better helped by an increased awareness and understanding of the effects of early trauma and loss on development. Specifically, adopted children may be susceptible to indirect effects of policies and systems that reflect an incomplete understanding of transitions within care and securing permanence for children. For those tasked with supporting adopted children in school, the strong indication from this review is that such intervention needs to be continued and empirically evaluated. After almost a century of adoption research, an achievement gap persists. Perhaps this gap exists as a result of complex interactions between many factors including behavioural and emotional adjustment, teaching strategy, parenting style and investment, resolution of identity status, and attachment security. Despite awareness of their vulnerability, and any interventions that may be in place, adopted children, on the whole, still appear struggle to achieve their best possible outcomes in education.

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Figure 1: PRISMA flow diagram for screening and selection

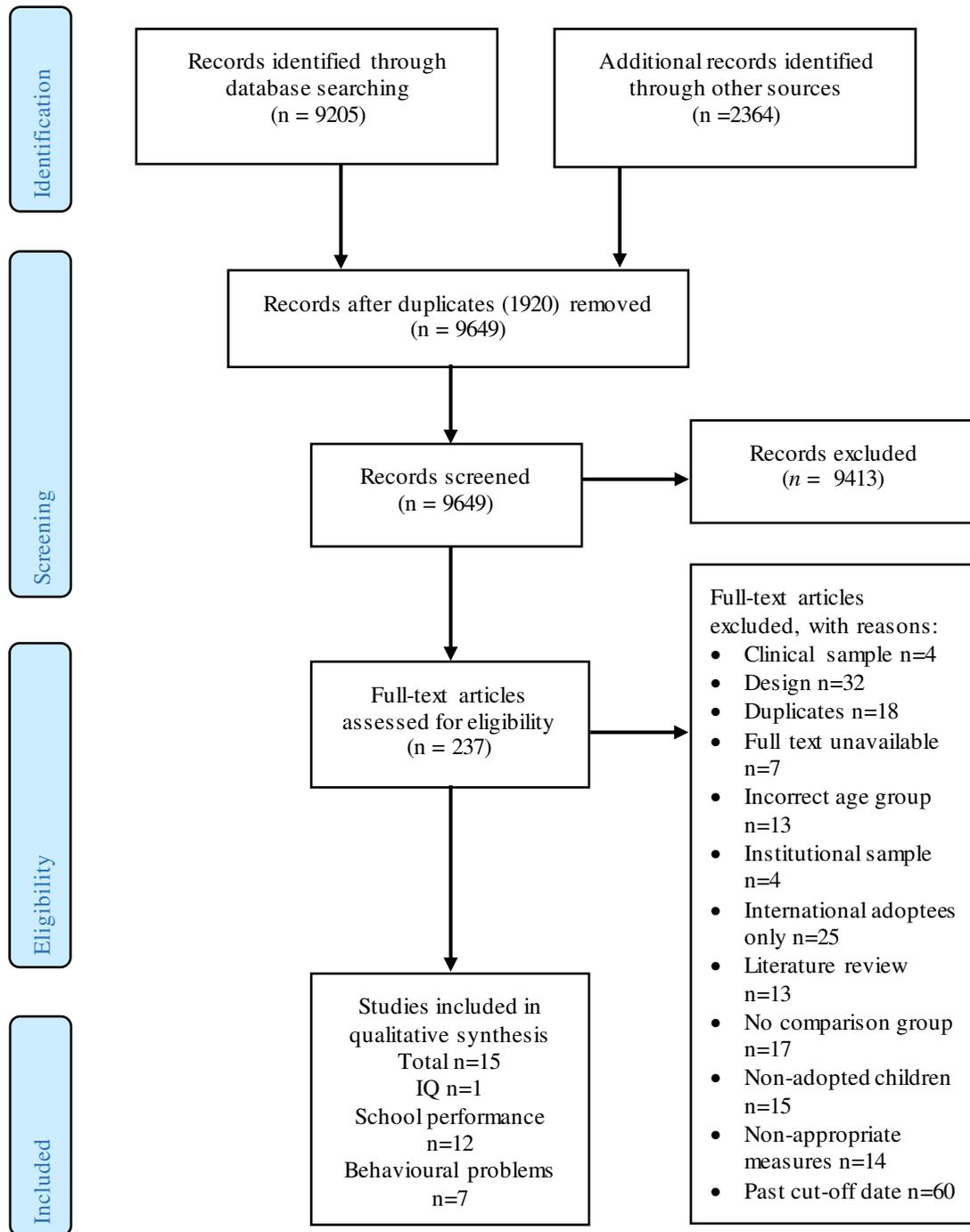


Table 1: Characteristics and key findings of included studies measuring IQ and school performance

Study	Data source	Groups		Age		Pre-adoption experience	Measures	Key Findings
		Adopted	Comparison	Adoption	Assessment			
IQ								
Lewis et al (2007)	Primary	Multiple placements (n=33)	General population (n=27); Single placement (n=42)	7.6mo	5.4yrs	Neglect (52%); physical abuse (12%); parental substance abuse (67%)	WPPSI-R; PPVT -III	Adopted groups significantly lower scores (single placement M=96; multiple placement M=95.9) on VIQ tests at 5-6yo than comparison group (M=106.4).
School Performance								
US Studies								
Bramlett (2011)	NSAP	n=2089	Sub-group of NCHS sample (n=2022)	<1: 14.4% 1: 13.9% 2-5: 42.1% 6-10: 20% 11-17: 9.6%	6-17yrs	Not reported	Parent report of performance	Children adopted from care significantly more likely to be rated as poor than all children on English and Maths performance. Also, significantly less likely to be rated as excellent in both subjects.
Burrow et al (2004)	NLSAH	n=420	n=8536	Not reported	12-19yrs	Not reported	Combined Average Grade (English, maths, history/ social studies, science)	Adoptees awarded significantly lower average grades on self-reported scales. Female adoptees significantly higher grades and less behaviour problems than males.
Howard et al (2004)	Primary	Child welfare adoptions (n=1340)	General population (n=175); Domestic Infant Adoption (n=481)	Infant <12mo Child Welfare - 3.6yrs ICA - 1.5yrs	Gen. pop. - 13.2yrs ; Infant Adoption - 12.5yrs ; Child Welfare - 12.1yrs; ICA - 10.9yrs	Neglect 63%; pre-natal substance exposure 60%; 2+ moves 37%; physical abuse 33%	Grade retention; low grades	Children adopted from care more likely to receive SEN services, repeat 1 or more grades and have average grades lower than D. Significantly lower scores on grade retention and grade level than international and infant adoptees.
Iervolino (2003)	CAP	n=142-200	n=170-223	29 days	9-12yrs; 13-15yrs	Infant	Teacher rated grade and class performance in reading and maths	Adopted children rated significantly lower than non-adopted on grade and class performance in both English and maths.
Lloyd & Barth (2011)	NSCAW	n=191	Foster care (n=99)	<5.5 years	5yrs	48% severe maltreatment (physical/ emotional abuse - 16%; neglect - 56%)	WJ	Adopted group significantly higher scores than LAC. Both groups scored around the mean.
McClelland et al (2013)	CAP	n=209	n=221	29 days	7yrs	Infant	PIAT (reading); WISC-R (maths)	Being adopted was significantly related to lower maths scores at ages 7, but not reading scores.

Study	Data source	Groups		Age		Pre-adoption experience	Measures	Key Findings
		Adopted	Comparison	Adoption	Assessment			
Raleigh & Kao (2013)	ECLS-K	n=156	n=10,477	<5yrs	8-9yrs (US third grade)	Not reported	NCES	Adopted children showed lower reading and maths scores. There was significant variation among adoptive families by race and health. A higher proportion of special needs in the adopted group was seen.
Thomas (2016)	ACS	n=41,189	n=1,287,856	2.87yrs	13.5yrs	Not reported	Grade for age; grade retention	Adopted children more likely to fall behind compared to comparison group. Stable across each grade 10-17yo. Adopted children fare better than LAC.
Weinberg <i>et al</i> (2004)	TRA	n=125	n=133	23.37mo	19yrs	Not reported	Parent report on composite scales	Adoptees more likely to be perceived as having experienced adjustment problems Inter-racial adoptees 3.6 times, black adoptees 3.36 times, Asian 3.87 times more likely to have school problems as compared to non-adopted siblings in adoptive placement.
Zill & Bramlett (2014)	NSCH	n=1076	n=63,766	Not reported	M=10.7yrs (adopted); M=8yrs comparison	Not reported	Grade retention; school engagement	Rate of grade retention for adopted children (aged 6-17) 3 times higher than non-adopted. No difference to LAC group. Adoptees significantly less engaged in schoolwork than non-adopted even after adjustment for demographic, parent education and income disparities.
European Studies								
Study	Data source	Groups		Age		Pre-adoption experience	Measures	Key Findings
		Adopted	Comparison	Adoption	Assessment			
Vinnerljung & Hjern (2011)	Nat. registers	n=899	General population (n=900,418); Foster Care (n=3062)	6mo	16yrs	Not reported	Final year grade	Adoptees achieve significantly higher average grades than those in foster care but less well than general population comparison group. Differences remain after adjusting for birth parent characteristics.
Wijedasa & Selwyn (2011)	LSYPE	n=31	n=12,388	Not reported	15-16yrs	Not reported	Statutory test (GCSE)	Most adopted children achieved expected level of progress in Key Stage 3 in all 3 core subjects – more than general population, fostered and children in need. For GCSE most achieved the 5A*-CEM benchmark, significantly more than fostered and children in need; similar to general population.

Note: **CAP:** Colorado Adoption Project; **NLSAH:** National Longitudinal Study of Adolescent Health; **ICA:** Intercountry Adoption; **SEN:** Special Educational Need; **NSAP:** National Survey Adopted Parents; **NCHS:** National Centre for Health Statistics; **NSCAW:** National Survey Child and Adolescent Wellbeing; **WJ** – Woodcock Johnson III Tests of Achievement; **LSYPE:** Longitudinal Study of Young People in England; **GCSE:** General Certificate Secondary Education; **5A*-CEM** – Benchmark achievement level commonly used in UK educational statistics for expected level of achievement in Statutory test at KS4 (age 16) – 5 **GCSE** grades at A*-C, two of which are English and Maths; **PIAT:** Peabody Individual Achievement Test; **WISC-R:** Weschler Intelligence Scales for Children- Revised; **ECLS-K:** Early Childhood Longitudinal Study - Kindergarten; **NCES:** National Center for Educational Statistics; **NSCH:** National Survey of Children’s Health; **LAC:** Looked After Children; **ACS:** American Community Survey; **TRA:** Minnesota Trans-racial Adoption Study; **WPPSI-R** – Wechsler Preschool and Primary Scale of Intelligence - Revised; **PPVT-III** – Peabody Picture Vocabulary Test – 3rd Edition; **VIQ:** Verbal Intelligence Quotient.

Table 2: Characteristics and key findings of included studies measuring behavioural and emotional problems

Study	Data source	Groups			Age		Pre-adoption experience	Measures	Key Findings
		Adopted	Comparison 1	Comparison 2	Adoption	Assessment			
US Studies									
Howard et al (2004)	Primary	Child welfare adoptions (n=1340)	General population (n=175)	Domestic Infant Adoption (n=481)	Infant <12mo Child Welfare - 3.6yrs ICA – 1.5yrs	Gen. pop. – 13.2yrs; Infant Adoption – 12.5yrs; Child Welfare - 12.1yrs; ICA – 10.9yrs	Neglect 63%; pre-natal substance exposure 60%; 2+ moves 37%; physical abuse 33%	BPI	Children adopted from care significantly higher incidence of behaviour problems than non-adopted. Child welfare adoptions 3.4 times more likely (ICA 2.4 times) to be in upper quartile of BPI than children not in those groups.
Lewis et al (2007)	Primary	Multiple placements (n=33)	General population (n=27)	Single placement (n=42)	7.6mo	5.4yrs	Neglect (52%); physical abuse (12%) parental substance abuse (67%)	CBCL	Children with experience of multiple placements scored significantly higher on total, externalising, oppositional and aggressive behaviour sub-scales than both other groups. No significant differences were found between all three groups on sub-scales of attention and internalising behaviour.
Lloyd & Barth (2011)	NSCAW	n=191	Foster care (n=99)	Returned home (n=63)	Not reported	0-14yrs	48% severe maltreatment (physical/emotional abuse – 16%; neglect – 56%)	CBCL	No significant differences between all three groups. On the Internalising scale all three groups had more than 90% in the non-clinical range. On the Externalising scale all three groups had about 80% in the non-clinical range.
Nilsson et al (2011)	CAP	n=202	Matched general population (n=215)	n/a	<6mo	17yrs	Infant adoption average 29 days in foster care from birth (range 2-172 days)	DISC	No significant differences between adopted and non-adopted children on all conduct measures. Female adoptees showed higher levels of conduct problems than female non-adoptees but no differences between adopted and non-adopted males were found.
Weinberg et al (2004)	TRA	n=125	Non-adopted siblings (n=133)	n/a	23.37mo	19yrs	Not reported	Parent report on composite scales	Inter-racial adoptees 3.25 times, black adoptees 7.85 times, Asian 3.14 times more likely to have school problems as compared to non-adopted siblings in adoptive placement.

Study	Data source	Groups			Age		Pre-adoption experience	Measures	Key Findings
		Adopted	Comparison 1	Comparison 2	Adoption	Assessment			
Zill & Bramlett (2014)	NSCH	n=1076	General population (n=63,766)	Foster Care (n=481)	Not reported	M=10.7yrs (adopted); M=8yrs comparison	Not reported	Parent report of official diagnosis	More than a third adoptees diagnosed with ADD/ ADHD, significantly more than LAC (22%) and non-adopted (5%). No differences between adopted and LAC groups for diagnosis of conduct disorder (20% and 18% respectively). Both groups significantly more than 1% of non-adopted children diagnosed with conduct disorder.
European Studies									
Sanchez-Sandoval & Palacios (2012)*	Primary	n=80	Classmates (n=140)	Residential foster care (n=92)	Not reported	7-11yrs 12-16yrs	Not reported	RRTS	Compared to current classmates adopted children showed significantly higher levels of emotional and behaviour problems Compared to children in residential foster care, adopted children showed fewer problems, especially in primary education.

Note: ICA: Intercountry Adoption; BPI: Behaviour Problem Index; CBCL: Child Behaviour Checklist; NSCAW: National Survey Child and Adolescent Wellbeing; CAP: Colorado Adoption Project; DISC: Diagnostic Interview Schedule for Children – Child Version; RRTS: Revised Rutter Teacher Scale; ADD/ADHD: Attention Deficit Disorder/ Attention Deficit/ Hyperactivity Disorder; NSCH: National Survey of Children's Health; LAC: Looked After Children; TRA: Minnesota Trans-racial Adoption Study.