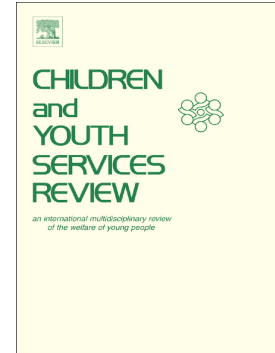


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Aoife O'Higgins, Judy Sebba, Frances Gardner

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What are the factors associated with educational achievement for children in kinship or foster care: A systematic review

Aoife O'Higgins^a, Judy Sebba^a & Frances Gardner^b

- a. Rees Centre for Research on Fostering and Education,
Department of Education, University of Oxford
28 Norham Gardens, Oxford, OX2 6PY, UK
aoife.ohiggins@education.ox.ac.uk (corresponding author)
judy.sebba@education.ox.ac.uk

- b. Department of Social Policy and Interventions, University of
Oxford
Barnett House, 32-37 Wellington Square, Oxford OX1 2ER
frances.gardner@spi.ox.ac.uk

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Abstract

Children in care lag behind their peers on a number of outcome measures, including education. Interventions have been developed to help them close the gap with their peers but these have had limited success to date. One possible reason for this may stem from our lack of understanding about underlying processes and mechanisms.

This paper presents the findings of a systematic review of the factors associated with educational outcomes for children in foster and kinship care. It aims to inform the literature on risk and protective factors and inform the development of future interventions.

Eight major databases and websites were searched between 1990 and 2016 using a combination of mesh terms. Studies were included if they tested the statistical association between any variable and educational outcomes for school age children in foster or kinship care in high-income countries. Children in other placement types were excluded. Titles and abstracts were screened for 7135 studies identified through searches. Full texts were obtained for 298 and 39 were retained for inclusion.

Over 70 factors were identified. For the purposes of the narrative synthesis, factors were categorised into spheres of influence adapted from Bronfennbrenner's (1979) ecological framework. The findings reveal significant heterogeneity. Male gender, ethnic minority status and special educational needs were consistent predictors of poor educational outcomes, while carers' and young people's aspirations appeared to predict greater success. The findings are discussed with implications for future research and practice.

Keywords: systematic review, education, out of home care

1. Introduction

Low educational attainment of children in care is a problem which cuts across borders and time (Dill, Flynn, Hollingshead, & Fernandes, 2012; Goddard, 2000; Sebba et al., 2015). Indeed research has documented an important gap between the educational outcomes for children in care and their peers across many geographical contexts (Berridge, 2012; Goddard, 2000; Scherr, 2007; Trout, Hagaman, Casey, Reid, & Epstein, 2008). There are children in care who enjoy academic success (Jackson & Martin, 1998; Rees, 2013), but too many are struggling to keep up and the majority eventually fall behind their peers. Research has also documented that care experienced people are more likely to experience poor mental and physical health, high unemployment and be involved with the criminal justice system (Blome, 1997; Buehler, Orme, Post, & Patterson, 2000; Centre for Social Justice, 2015; Dregan, Brown, & Armstrong, 2011; Dregan & Gulliford, 2012; Forsman, Brännström, Vinnerljung, & Hjern, 2016; Harris, Jackson, O'Brien, & Pecora, 2009; Vinnerljung & Hjern, 2011). Greater educational success has been linked to better long-term outcomes, so raising educational attainment is an important strategy to interrupt these negative life trajectories (Forsman et al., 2016; Gorard, Beng, & Davies, 2012).

Recent research has provided useful overviews of the academic attainment of children in care. In a systematic review (limited to literature from the USA), Trout et al. (2008) found that a third or more of children in care performed in the “low to average” or “low” range. There was very little evidence of children in care performing above average. The review also found frequent school changes, high numbers of students repeating a grade, multiple absences and high exclusion¹ rates. A meta-analysis examining the educational experiences of children in care found that they were disproportionately represented in special education, had high rates of grade retention and experienced exclusion at higher rates than their peers (Scherr, 2007). Two other reviews on maltreated children and educational outcomes reached similar conclusions, though these were not limited to children in care nor systematically conducted (Romano, Babchishin, Marquis, & Fréchette, 2014; Stone, 2007).

The reasons for the low attainment of children in care, however, have not been well characterised. Recent reviews have approached the problem from a different perspective, looking principally at interventions to help raise the attainment of children in care, rather than studying the factors associated with poor educational outcomes. Systematic reviews have assessed the effectiveness of specialised service provision compared to standard out of home placements,

¹ We use the English term exclusion, to describe all exclusions, suspensions and expulsions from school.

with the specialised treatment being either kinship care (Winokur, Holtan, & Batchelder, 2014) or multidimensional treatment foster care (MTFC) (MacDonald & Turner, 2008). These reviews report on several outcomes, including education. Only Macdonald and Turner (2008) found a statistically significant effect, which was improved school attendance for girls in MTFC. Three other reviews (Brodie, 2009; Forsman & Vinnerljung, 2012; Liabo, Gray, & Mulcahy, 2012) examine the effectiveness of a range of interventions targeting poor educational outcomes for children in care. These report mixed results. Importantly, the reviews make scant mention of the characteristics and care histories of participants and do not to explore whether the results are moderated by age, length of time in care or reason for entry. Review conclusions also suggest that the interventions, with the exception of tutoring, may lack an explicit theory of change and in some cases a strong evidence base. It is therefore critical to gain a more in-depth understanding of key predictors underlying poor academic performance in order to develop sound theories of change and strengthen the evidence base for interventions for this population.

The present review seeks to complement and further existing research by identifying and reviewing predictors of educational outcomes for children in care. In so doing, it extends the findings from reviews on the gap between children in care and their peers as well as providing information on risk correlates and risk factors. Understanding risk and protective factors is essential for the development of effective interventions (Fraser, Richman, Galinsky, & Day, 2009; Rutter, 2000). To support such research recent research working definitions of risk factors have been proposed. Risk correlates are variables that are negatively correlated with each other. When a risk correlate occurs prior to the outcome these are defined as risk (or promotive or protective) factors. The term causal risk factor is used where causality has been established (Kraemer, Kraemer Lowe, & Kupfer, 2005; Murray, Farrington, & Eisner, 2009). The study of risk factors is also an area of increasing interest in the foster care field (see for example Oosterman, Schuengel, Wim Slot, Bullens, & Doreleijers, 2007). For example, a systematic review of risk factors for placement instability for children in care was undertaken by Oosterman et al. (2007); inclusion criteria were deliberately broad to identify as many risk variables as possible, including risk correlates emanating from cross-sectional studies. The present review takes a similar approach and includes evidence from cross-sectional and longitudinal studies, in order to identify risk correlates as well as risk factors for educational outcomes.

The objective of this review is to describe the current best evidence on the predictors of educational outcomes for children in care. In doing so it seeks to expand the evidence on the education of children in care, and contribute to nascent research in social work on risk factors and more specifically risk factors for young people in care, with the ultimate aim of informing interventions for

these children. To date no review has undertaken this task. This review also explores the implications of the findings for future research on risk and protective factors for children in care.

2. Methodology

This review sought to answer the following question: what are the factors associated with educational outcomes for school age children in care? The search strategy and methodology are outlined here.

The following databases and websites were searched for references: ERIC, British Education Index, Australian Education Index, International Bibliography of Social Sciences, Scopus, Medline, PsycInfo, Social Services Abstracts, Sociological Abstracts, Database of Education Research (EPPI Centre), Campbell and Cochrane Libraries, Social Policy and Practice (part of SCIE), Google and Google Scholar, NFER, C4EO, CERUK Plus, SCIE, The Fostering Network, BAAF, NCB, NSPCC, Joanna Briggs Institute, What Works Clearinghouse, Department for Education, Chapin Hall, Office of Planning, Research and Evaluation in Administration for Children and Families (USA). Children and Youth Services Review was hand searched and several international experts were consulted. Searches were conducted for publications between 1990 to March 2016. The earlier cut off date was selected to reflect important legal and policy changes that occurred in child welfare in the 1980s as well as the changing population of children in care (Dregan & Gulliford, 2012; Elizabeth Fernandez & Barth, 2010).

The following search strings were used: ("foster care" OR "foster home" OR "foster family" OR "foster parent" OR "foster carer" OR "substitute family" OR "family foster home" OR "kinship care" OR "child in care" OR "children in care" OR "out-of-home care" OR "out of home care" OR "looked after" OR "looked-after") AND (Educat* or school* or class* or college* or teach* or learn* or train* or diploma* or certificate* or tutor* or achiev* or perform* or academic).

Adaptations to the terms and MeSH searching were implemented, depending on the particularities of each database. Additionally, reference and citation lists in published works and grey literature were reviewed.

Inclusion criteria: Studies were included if these tested the statistical association between any given variable and educational outcomes, including test scores, grades or marks, exam results, academic competency scores, cognitive abilities, attendance, grade retention and exclusions, of children in foster or kinship care in high-income² countries. Children in all other placement types,

² Countries were defined by income in accordance with the World Bank classification. Only high-income countries were considered because children's services and foster care operate in broadly similar contexts in these countries.

including residential care were excluded because their educational needs and circumstances differ (Knorth, Harder, Zandberg, & Kendrick, 2008; Sinclair, 2010; Whittaker, 2006). Where it was unclear what placement type children were in, authors were contacted for clarification. The review focused on school age children, so only studies in which the outcome was measured between the ages of 5 and 19 were included. Cross-sectional and longitudinal studies were both included to capture a broad picture of the current evidence on predictors of educational outcomes.

Titles and abstracts were screened for 7137 studies identified through searches. Full texts were obtained for 298 studies, which appeared to meet the inclusion criteria based on information provided in the title and abstract. Thirty-nine were retained for inclusion, seven had samples which partly overlapped; these are included here because they test associations for different factors. In preparation of this review, the authors followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) criteria (Moher, Liberati, Tetzlaff, Altman, & Group, 2009), see section 3.3. The table in Appendix A provides a list of included studies. Meta-analysis was considered, but heterogeneity was too great to do this as there were too few studies analysing the same factor and outcome that also used a similar methodology (Borenstein, Hedges, Higgins, & Rothstein, 2010).

3. Description of included and excluded studies

3.1. Description of included studies (see appendix A for details)

The majority of identified studies were conducted in the USA ($k = 24$). There were five studies from Canada, five from the UK, four from Australia, and one from Sweden.

The 39 included studies comprised a total of 88,775 students. All studies reported on participant age: some included school age children of any age (5 to 18 years), while others focused on a cohort within one grade level or a smaller specified age range. One study did not report on the gender split (Mitic & Rimer, 2002) and one used an all female sample (Pears, Kim, & Leve, 2012). Remaining studies had samples that ranged from 40% to 62% female. Six studies did not provide data on the ethnicity of participants. In the studies that did, it was not reported whether the distribution was representative of the local or national population. Most studies that included children with special educational needs³ did not provide prevalence rates, and where they did few described whether these were physical, learning disabilities or emotional and behavioural

³ Special educational needs is used throughout this review as an umbrella term to include difficulties such as autism or learning difficulties, as well as physical disabilities. It is acknowledged that the term may have different meanings in different countries and contexts.

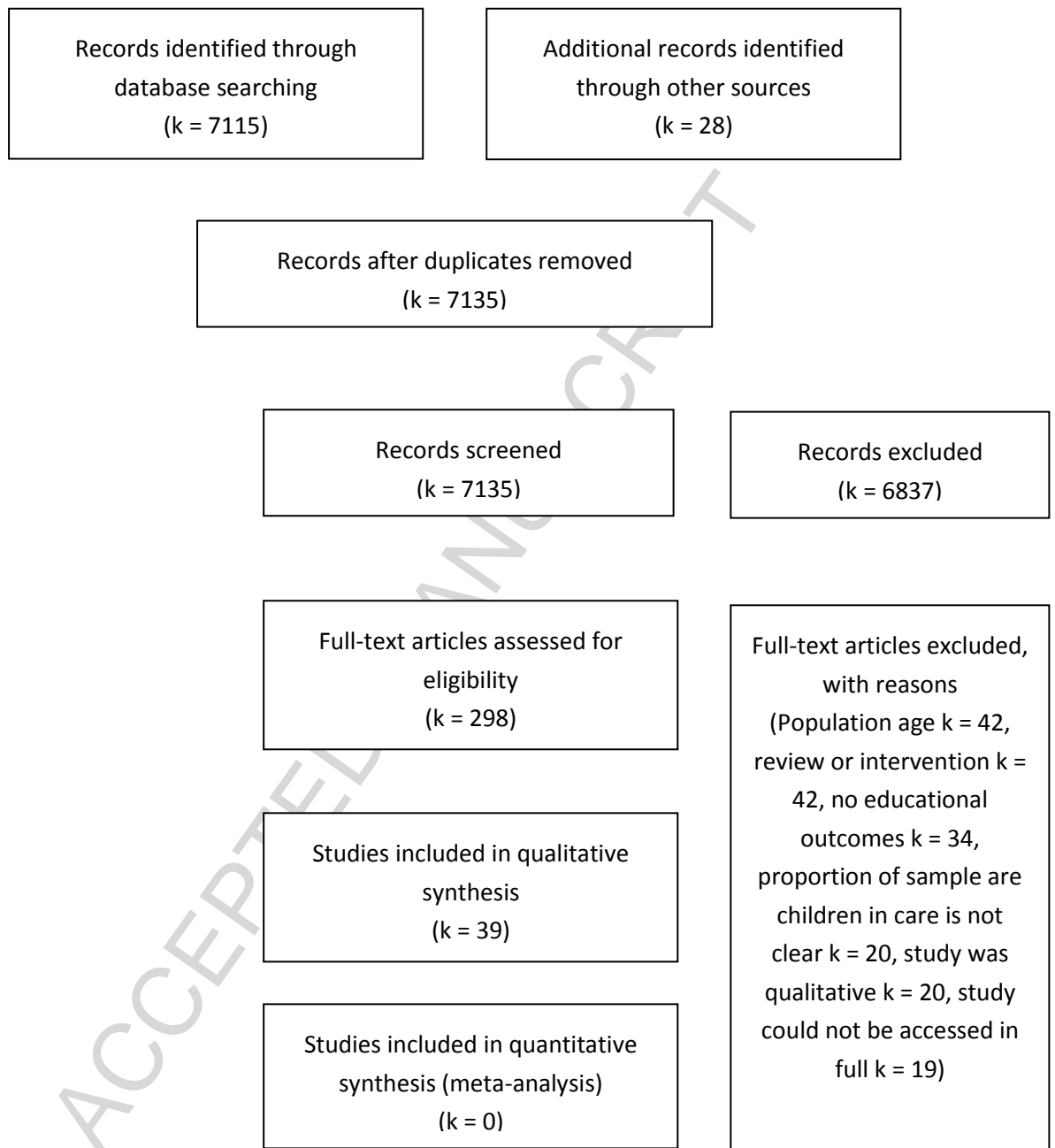
problems. This is important because these groups are distinct and their educational outcomes will be affected differently according to the nature of their need. Half the included studies reported on placement type. Few studies reported the socio-economic status of children (of their birth families or carers) or whether the study setting was rural or urban. Only three studies reported on characteristics of birth parents and none reported whether children were accommodated by state or non-state providers of care. Finally, only one study reported whether other interventions were provided to children in care in that locality.

The aim of the review was to identify the factors associated with educational outcomes for children in foster or kinship care. Over seventy different factors were examined in the included studies, though not all were found to be associated with educational outcomes. These factors were grouped into four spheres of influence adapted from Bronfenbrenner's (1979) ecological framework: individual (for example gender and special educational needs), birth family (for example level of education of the birth parents), care experience (for example placement type and length of time in care) and school experiences (for example grade retention and number of schools attended). No identified studies examined associations with broader structural factors or policy. The ecological framework recognises the various spheres that children interact in and which interact with each other. This approach reflects the complexity of children's experiences and the combination of factors to which they may be exposed.

3.2. Excluded studies

The literature on the education of children in care is vast, so many studies were identified in the search but did not meet the inclusion criteria. In total, 261 studies were excluded. The most common reasons for exclusion were: the population were preschool children or young people were over the age of 18 (k=42), the study was a review or an intervention (k=42), there were no educational outcomes (k=34), it was not clear what proportion of the sample, if any, were children in care (k=20), data was qualitative only (k=20) or studies could not be accessed in full (for example, articles were in old journals and authors could not be contacted) (k=19).

3.3. Prisma flowchart (Moher et al., 2009)



3.4. Critical appraisal of included studies

Overall, because the inclusion criteria were broad, included studies were heterogeneous making comparisons difficult and meta-analysis inappropriate, a common problem in this type of review (Losel & Bliesener, 1990; Losel & Farrington, 2012; Murray et al., 2009). To facilitate the narrative review, each included study was first assessed for quality, and findings were then grouped thematically to highlight the key points. All included studies were critically appraised using the Critical Appraisal Skills Programme checklists (CASP, 2015) and Cambridge Quality Checklists as guidelines (Murray et al., 2009). An overview of the methods and limitations of the included studies is given below.

The included studies used a variety of experimental and quasi experimental designs and statistical analyses. Twenty-one studies used a comparison group of children who were not in care to compare educational achievement of both groups. But the majority of included studies ($k=30$) examined associations between risk variables and outcomes within samples of children in care only. Twenty-eight studies were cross-sectional and eleven were longitudinal prospective studies. Ten tested associations between predictors and outcomes with T-tests, ANOVA and chi-square methods. The majority ($k=21$) used regression analyses (linear, logistic, step-wise and cox); two of these also used interaction analysis. The remaining studies used ANOVA ($k=9$), t-tests ($k=6$), path analysis and structural equation modelling ($k=2$), propensity score matching ($k=1$), instrumental variables ($k=1$) and latent curve growth analysis ($k=1$). One study did not present full details of statistical analyses (Sawyer & Dubowitz, 1994). Only one included study had for objective to determine the causal influence of a particular variable (placement type) on educational outcomes (Font, 2014).

Limitations of the studies, in particular the risks of bias, directionality and pathways between predictor variables and outcomes were rarely discussed. Moreover, methodological designs, with the exception of one study, were not appropriate to infer causality and all findings should be interpreted with this in mind (Murray et al., 2009). In terms of data collection, most studies collected data prospectively (gathered regularly for statutory purposes and entered into administrative datasets then used for research). For example, in Weiss and Fantuzzo (2001) information about birth risks were extracted from administrative data held by the Department of Public Health. The majority of studies ($k=23$) used data from administrative datasets, which may limit problems of recall bias (for example where placement change is recorded by social services at the time of the event). However, it was not always made explicit how administrative datasets were compiled. Several studies used self-report measures or information gathered from a carer or teacher only. This may influence findings if young people are subject to social desirability bias, or carers

or teachers don't know children well, for example. The majority of studies did not report on the validity or reliability of measures used, which may have major impact on results (Murray et al., 2009). Not all risk variables analysed in included studies represented validated concepts (for example measures of well being). Even where data were less vulnerable to bias (for example length of time in care), it was not always clear how these were defined and measured. Seven studies used outcomes reported by several sources, including teachers, social workers, carers and young people. Sixteen studies used measures such as test scores, grade retention or attendance rate which may be more objective. Outcomes reported by foster carers or young people only, on the other hand, may be subject to important bias, including recall or social desirability bias. Two thirds of included studies used more than one outcome measure and five used composite measures. Outcome measures included indicators of academic competency (for example grades, literacy or numeracy test scores), cognitive test scores (for example IQ) and school functioning (for example attendance, grade retention).

The majority of included studies used random or census sampling, thus reducing the risk of selection bias. Most, but not all, studies clearly identified the population and any exclusion criteria. However, it was not evident that "being in care" was defined similarly across studies. Not all studies provided detail of attrition or young people who chose not to participate. Some studies excluded – deliberately or not – children with severe intellectual impairments, medical problems or those who were absent on the day of testing. Six studies (from four datasets) had a sample size smaller than 100, fifteen had sample sizes ranging from 100 to 500, five had sample sizes between 500 and 1000 and thirteen studies had samples larger than 1000.

In discussing the findings of each study, details of the critical appraisal are highlighted where the evidence is particularly strong or weak. Readers may otherwise assume that study designs are adequate for the purposes of the analyses carried out.

4. Findings: what factors are associated with educational outcomes for children in care?

The review included 39 studies that examined associations between one or more variables and educational outcomes. In summarising the results some of the complexity from each study is lost. Standardized effect sizes are not computed because of the lack of data in original studies. Details of covariates, sample sizes and *p*-values for estimates can be found in the table in Appendix A and in the original studies.

4.1. Child level factors

The included studies examined the associations between educational outcomes and four fixed factors (age, gender, ethnicity and special educational needs) and five malleable factors (behavioural problems and executive function, mental health and well being, cognitive ability, language and physical health).

Age

Half the included studies examined the relationship between age and attainment. Evidence overall was mixed: ten studies found that no link existed whereas in nine it appeared that older children, relative to younger peers in care, performed worse on some outcomes (Burley & Halpern, 2001; Cheung, Lwin, & Jenkins, 2012; Choice et al., 2001; Flynn, Tessier, & Coulombe, 2013; Heath, Colton, & Aldgate, 1994; Pears, Fisher, Bruce, Kim, & Yoerger, 2010; Turpel-Lafond, 2007; Wise, Pollock, Mitchell, Argus, & Farquhar, 2010; Zima et al., 2000). In Zima et al. (2000) and Wise et al. (2010) older children had a higher risk of exclusion than younger children, but age did not predict overall achievement. In Burley and Halpern (2001) and Turpel-Lafond (2007), the attainment gap between children in care and young people in the general population was larger for teenage youth than it was for younger children.

The findings provide some evidence that children in care fall behind their peers as cognitive loads increase. Older children may also have greater behavioural problems leading to higher risk of exclusion and other academic difficulties. Conversely, the link between age and outcomes may be an artefact of the study design or population. For example, length of time, and age at entry in care are likely to be closely related to age but few studies accounted for these variables in their analysis. Studies that did (for example Berger, Bruch, Johnson, James, & Rubin, 2009) found no relationship between older age and educational outcomes. Overall, the evidence of an association between older age and attainment is not strong.

Gender

The majority of included studies ($k=23$) examined the relationship between gender and educational outcomes for children in care. Fourteen studies found that girls outperformed boys on some or all educational outcomes (Cheung et al., 2012; Conger & Rebeck, 2001; Evans, 2001; Flynn et al., 2013; Kirk, Lewis, Brown, Nilsen, & Colvin, 2012; McClung & Gayle, 2010; Pears, Kim, Fisher, & Yoerger, 2013; Sebba et al., 2015; Townsend, 2012; Turpel-Lafond, 2007; Vinnerljung & Hjern, 2011; Wise et al., 2010; Zima et al., 2000; Zorc et al., 2013).

However, in Evans (2001) girls had better achievement than boys on every outcome except maths reasoning. In Stein (1997), boys in foster care had better language and overall performance. In McClung and Gayle (2010) boys had better grades than girls in foster care, but girls outperformed boys in other placement types. In McClung and Gayle (2010) and Vinnerljung and Hjern (2011) study samples included children in care as well as other groups of children, but no interaction analyses were carried out to examine the combined effects of gender and care status on educational outcomes.

These findings, though mixed, mirror broad gender differences in academic achievement in the general population (DfES, 2007), so it is not surprising that these differences should be replicated to some extent in the care population.

Ethnicity⁴

Overall, in the 14 studies that examined the association of ethnicity and educational outcomes, it appeared that belonging to a minority ethnic group was associated with lower educational outcomes.

Children from Native American and Aboriginal backgrounds had substantially poorer outcomes than other children in care or children from similar ethnic groups in the general population (Burley & Halpern, 2001; Mitic & Rimer, 2002; Townsend, 2012; Turpel-Lafond, 2007). African-American children also appeared to perform worse than their peers from white backgrounds across studies (Burley & Halpern, 2001; Conger & Rebeck, 2001; Evans, 2001; Hegar & Rosenthal, 2009; Zima et al., 2000). In Conger and Rebeck (2001) children from white ethnic backgrounds had better attendance but there were only small differences in reading or maths test scores in multivariate analyses. In Burley and Halpern (2001) being Hispanic was associated with lower attainment whereas being of Asian descent predicted better outcomes.

Some studies didn't find an association between ethnicity and educational outcomes, for example Berger et al. (2009); however this may be because a number of other variables, often linked to ethnicity in at risk populations, are taken into account, for example socio-economic status, level of education of carers and whether it is a single parent household.

Ethnicity in and of itself is not a risk variable for educational outcomes (Kraemer et al., 2005). Rather, the findings cited above may reflect disadvantages faced by children from minority backgrounds.

These findings broadly mirror the literature on ethnicity and educational outcomes in the general population in the respective contexts of each study (DfES, 2006; Helme & Lamb, 2011; Kao & Thompson, 2003; Richards, 2008).

⁴ We employ the terms to describe ethnic groups as they are used in individual studies.

Special educational needs (SEN)

Studies included in this review reported a high prevalence of SEN among children in care, echoing previous research (Goerge, Voorhis, Grant, Casey, & Robinson, 1992; Scherr, 2007; Trout et al., 2008).

Eight studies found that involvement in special education programmes predicted lower educational outcomes (Burley & Halpern, 2001; Choice et al., 2001; Evans, 2004; Geenen & Powers, 2006; Sebba et al., 2015; Stein, 1997; Turpel-Lafond, 2007; Wise et al., 2010). In Burley and Halpern (2001), having SEN was associated with substantial educational difficulties, even after being in care was taken into consideration. The strength of this association also appeared to increase as children got older. Turpel-Lafond (2007) found that only 12% of children in care with special needs graduated from secondary school compared to 34% of children in care who do not have special needs and 36% of children with special needs who are not in care. In Geenen and Powers (2006) children with special educational needs in foster care performed worse on test scores than children in care without special educational needs or children with special educational needs who were not in care. The latter groups had roughly similar attainment. Children in care with special educational needs had also attended more schools and had lower attendance than any other group. In Sebba et al. (2015) autistic spectrum disorder, moderate learning difficulties and severe of multiple learning difficulties predicted lower outcomes at age 16. However, other types of special educational needs, including physical disabilities and speech, language and communication difficulties did not.

Few studies defined special educational needs and whether children with special needs were tested with the same instruments as their peers. Prior research has documented the lower educational outcomes for children with special educational needs in the general population (for example Sylva et al., 2014). The findings indicate that special educational needs are a risk factor for children in care. There is also evidence that it is a greater risk factor for children in care than for children in the general population (Sebba et al., 2015).

Behavioural problems and executive function

There is a high prevalence of behavioural problems among children in care compared to children in the general population (E. Fernandez, 2008; Scherr, 2007; Sempik, Ward, & Darker, 2008). Eleven studies identified for this review analysed the link between behavioural problems and educational outcomes.

Cheung et al. (2012), Flynn et al. (2013) and Sebba et al. (2015) found that higher scores on the Strengths and Difficulties Questionnaire (SDQ) predicted lower academic achievement. In Shin (2003) drug abuse, a marker of risk taking behaviour, predicted poorer reading scores. Zima et al. (2000) and Zorc et al.

(2013) found that children with behavioural problems were significantly more likely to be suspended or report poorer attendance. However, in Zima et al. (2000) behavioural problems were not linked to academic skills delays. Moreover, children who scored in the 90th percentile for acting out behaviour (as assessed by their teachers) were less likely to experience suspension or exclusion. This may be a result of interventions provided specifically for these youths.

Pears et al. (2010) and Pears et al. (2012) found evidence of greater problems with executive function (inhibitory control, attention problems and lack of self-control) among children in care compared to children in a community sample; children in care also had poorer educational outcomes. Colton and Heath (1994) found mixed evidence of the relationship between behavioural problems and maths, reading and vocabulary test scores. Study subsample sizes were very small ($n=10$) at times, which limits the reliability of the findings. Pears et al. (2013) and Sawyer and Dubowitz (1994) found no link between behaviour and attainment. The latter study had a number of methodological flaws which may make its findings less reliable than others however.

Behavioural problems and poor executive function may constitute significant barriers to learning (Shonk & Cicchetti, 2001; Slade & Wissow, 2007). This review finds some evidence to support previous research findings. However, this did not hold across all included studies above. This may be because there was little variance in terms of behavioural problems in samples or because children in comparison groups had other difficulties which confounded the relationship between behavioural problems and educational outcomes. These findings also suggest that behavioural problems should not be equated with low ability or attainment. Of the studies which included a comparison group of disadvantaged children in the general population, it did not appear that children in care who had behavioural problems had lower attainment than children with behavioural problems who were not in care. The strength of the evidence was limited however by the study designs and by small sample sizes.

Mental health and well being

Five studies examined the association between mental health and well being and educational outcomes. Of these, four found that poor mental health and well being problems predicted lower attainment (Choice et al., 2001; Flynn et al., 2013; Perzow et al., 2013; Shin, 2003). One study found that having an emotional disorder was not associated with grade retention, overall achievement or suspensions from school (Wise et al., 2010).

Given the high prevalence of mental health problems among maltreated children (see for example Ford, Vostanis, Meltzer, & Goodman, 2007; Kerker & Dore, 2006; Meltzer, Gatward, Corbin, & Ford, 2003; Pilowsky & Wu, 2006), and

the known link between good mental health and academic success (Romano et al., 2014), it was surprising to find so few studies researching the link between mental health and education for children in care.

Cognitive ability as a predictor of success

Evans (2001) and Pears et al. (2010) found a strong positive association between measures of IQ and educational outcomes for children in care. However, in Perzow et al. (2013) IQ was not a significant predictor of any of four educational outcomes. These findings may indicate that IQ tests measure a similar construct to academic competence tests. Alternatively, it may provide some evidence that higher cognitive ability is a protective factor for positive development as argued in some psychological research (see for example Gutman & Flouri, 2011).

Language

Burley and Halpern (2001) and Sebba et al. (2015) examined whether speaking a language other than English at home was associated with educational outcomes. Burley and Halpern (2001) found that it predicted lower test scores in years 3, 6 and 9. In Sebba et al. (2015) speaking a language other than English at home at age 16, but not at age 7, was associated with higher outcomes at age 16. The contexts and timings of these studies are different; this may explain the different results.

Physical health

Two studies included variables related to children's physical health (Evans, 2004; Zorc et al., 2013). In Zorc et al. (2013) children with chronic health problems had statistically significantly lower average attendance (25.5 days absent) than children who didn't (21.1 days absent). In Evans (2001) low height, but not low weight, predicted lower attainment.

4.2. Factors pertaining to birth families

Relatively few studies ($k=4$) included data on the characteristics or involvement of birth families or other pre-care experiences.

Weiss and Fantuzzo (2001) and Vinnerljung and Hjern (2011) found that early childhood disadvantage and experiences of poverty were associated with poorer outcomes on a number of measures for all children in their sample, which

included children in care. Weiss and Fantuzzo (2001) also conducted interaction analyses to explore associations for children in care specifically. These did not suggest that early childhood deprivation had a different effect on educational outcomes for children in care compared to peers in the general population. McNichol and Tash (2001) also examined parental substance misuse and found that children in care who had been exposed to drugs prenatally scored significantly lower on IQ tests than those who had been exposed to drugs by their parents in early childhood. However, over time the latter group made significant progress and became the highest achieving group. Brooks and Barth (1998) found no significant difference between the grades or rate of grade retention between children in care who had been exposed to parental substance misuse and those who hadn't.

The evidence here suggests that pre-care experiences and characteristics or behaviours of birth parents play an important role in predicting educational outcomes, echoing research on children in the general population (see for example Sylva et al., 2014). Other studies examining the relationship between being in care and educational outcomes concluded that pre-care experiences were likely to explain an important part of the educational difficulties of children in care (O'Higgins, Sebba, & Luke, 2015; Stone, 2007).

4.3. Factors pertaining to care history

The included studies examined the associations between educational outcomes and eight themes relating to care history: reason for and age at entry, length of time in care, number and type of placement, characteristics of carers, placement with siblings and social work factors.

Reason for entry

Research on maltreatment, which is not restricted to children in care, has investigated how neglect and different abuse subtypes affect children's cognitive functioning (Crozier & Barth, 2005; Eckenrode, Laird, & Doris, 1993; Kendall-Tackett & Eckenrode, 1996; Romano et al., 2014; Trickett & McBride-Chang, 1995; Veltman & Browne, 2001; Viesel, Freer, Lowell, & Castillo, 2015). Nine studies identified for this review examined whether reason for entry and maltreatment experiences predicted educational outcomes.

Findings were not consistent across studies. For example, Weiss and Fantuzzo (2001) found that maltreatment (any type) was associated with poor educational outcomes. In contrast, in Conger and Rebeck (2001) the attendance of children who entered care because they were abused or neglected improved six months after they entered care, whereas attendance fell for children who

entered care for other reasons (for example behavioural problems). Moreover, in the same study, when the reason for placement was abuse or neglect, this predicted higher scores in maths, but not reading. McClung and Gayle (2010) found that children who entered care because of parental substance misuse or offending had better educational outcomes than children who came into care as a result of their own behaviour. In Evans (2001) children who were in care because of neglect had lower mean IQ, achievement means and greater rates of underachievement than children in care for other reasons (abuse, behavioural problems, court ordered). However, differences were not large. In Sebba et al. (2015), children who entered care because of disability had lower outcomes at age 16 than those who entered for abuse or neglect before the age of 9.

Petrenko et al. (2012) was the only identified study to include data on frequency and severity of abuse and neglect. Some children had also experienced more than one type of maltreatment. Children who had experienced supervisory neglect had higher verbal achievement than children who had experienced other types of abuse or neglect. There was no independent effect of any maltreatment subtype on non-verbal K-BIT scores or academic achievement in any of the analyses. Experiences of physical abuse and sexual abuse were associated with important behavioural – rather than educational – problems. These findings are broadly in keeping with the findings from previous studies on maltreatment in other populations (Eckenrode et al., 1993; Veltman & Browne, 2001). Moreover, the use of multiple study designs to analyse the relationship between these variables strengthens the evidence. Pears et al. (2010) found that there was no direct effect of maltreatment on school outcomes. However, there was an indirect relationship fully mediated through inhibitory control. Similarly, in Pears et al. (2013), maltreatment did not directly predict outcomes; but this relationship was mediated by affective school engagement (feelings about school) and cognitive school engagement (effort and self regulation of students). These findings suggest that it may not be maltreatment per se which affects school outcomes but rather the ways in which maltreatment manifests itself through children's behaviour.

Conflicting findings on maltreatment may be influenced by different definitions of maltreatment or the fact that data recorded usually reflects only one or the most recent incident of maltreatment. Frequency and severity are rarely documented for the purposes of research. Studies that find no independent effect of maltreatment on academic achievement may reflect the fact that there is little (recorded) variation in maltreatment experiences in a population of children in care. Alternatively, these could indicate that other variables – a safe care placement or good relationship with a carer – are working to attenuate the effects of maltreatment.

Age at entry into care

In most countries, children can be taken into care at any time between birth and 18; figures from 2001 appear to show no distinctive pattern of age on entry across countries (see Thoburn, 2010). In this review, seven included studies examined the relationship between age at entry and educational outcomes.

Burley and Halpern (2001), Sebba et al. (2015) and McClung and Gayle (2010) found that children who entered care as teenagers had poorer educational outcomes and progress than those who entered when they were younger. In Sebba et al. (2015) the longer teenage entrants stayed in care the better they fared. Children entering care at different ages are likely to have different experiences, for example most infants enter care because of abuse or neglect, whereas most teenagers go into care because they have behavioural problems or experience a family breakdown. It is thought that children entering care at a later date may have greater difficulties in a number of domains because of cumulative difficult experiences in early life, whereas early entrants to care should – in theory – benefit from safety and stability in care from an early age (see for example Delfabbro et al., 2002; Sempik, Ward, & Darker, 2008; Sinclair, 2007). However, Sawyer and Dubowitz (1994) found that children who entered care at age 12 or after performed better than those who entered when they were younger. However, more than 20 statistical tests were performed in that study, increasing the chances of spurious statistical associations. Three other studies found no link between age at entry and educational outcomes (Evans, 2004; Vinnerljung & Hjern, 2011; Wise et al., 2010). This may be because other variables were accounted for in these analyses.

Length of time in care

Recent data from the Department for Education in England concluded that there was a positive association between length of time in care and number of qualifications obtained at age 16 (DfE, 2014). This may reflect a positive effect of being in care in England. Only one study supports this hypothesis (AIHW, 2007), but the results from other included studies do not. In AIHW (2007) the longer children were in care the better their results in reading and numeracy tests in some states (AIHW, 2007). Conger and Rebeck (2001) determined that children performed better on reading and maths scores if they stayed in care for the minimum duration of the semester after they entered. Leaving care in the middle of the semester was associated with poorer attendance. However, this could be a reflection of how instability affects outcomes rather than length of time in care. Zima et al. (2000) found that children who had been living in foster care for a greater number of years were significantly more likely to be excluded from school than those who were in care for shorter periods of time. However, length

of time in care was not associated with academic skills or grade retention. Both Zima et al. (2000) and AIHW (2007) had smaller sample sizes than Conger and Rebeck (2001) but otherwise the studies had similar features. Thus, the conflicting findings may arise because of differences in national context or study features (covariates, outcomes and study samples selected).

Moreover, a further nine included studies conducted across a range of contexts, several of which used strong methodological designs and therefore increase our confidence in the findings, found no statistically significant link between length of time in care and educational outcomes (AIHW, 2011; Aldgate, Colton, Ghate, & Heath, 1992; Berger et al., 2009; Burley & Halpern, 2001; Evans, 2004; Geenen & Powers, 2006; Sebba et al., 2015; Sawyer & Dubowitz, 1994; Townsend, 2012). Several of these studies used longitudinal designs (AIHW, 2011; Aldgate et al., 1992; Berger et al., 2009; Sebba et al., 2015) suggesting moreover, that a shorter stay in care is not a risk factor for educational outcomes, as had been suggested by the data published by DfE discussed above.

Number of care placements and placement instability

Children in care move home more often (Oosterman et al., 2007; Ward, 2009), which may be disruptive to their education (Haveman, Wolfe, & Spaulding, 1991; Mehana & Reynolds, 2004). Eleven studies in this review examined the link between placement instability and educational outcomes.

In AIHW (2011) the higher the number of placements during a two-year period the lower the numeracy test scores. Also, the higher the number of placements in the 12 months prior to testing, the lower the likelihood of achieving reading and numeracy benchmarks, but this finding was not consistent across years. Sebba et al. (2015) also found that instability around exam time and placement changes after the age of 11 were associated lower exam scores at age 16. In Conger and Rebeck (2001) having a change of placement within the last 12 months was linked to more school transfers in the same year and it was moderately associated with attendance but it did not predict reading and maths scores. In contrast, Geenen and Powers (2006) noted that children who had experienced more placements had lower grade point average (GPA) in maths. Moreover, children with special needs were more likely to experience a greater number of placements. In Zima et al. (2000) greater instability predicted academic delays. Petrenko et al. (2012) found that children with a history of multiple care placements had greater academic delays above and beyond effects of maltreatment or neglect.

Six studies found no evidence of a link between placement instability or a high number of placements and academic outcomes (AIHW, 2007; Aldgate et al., 1992; Berger et al., 2009; Burley & Halpern, 2001; Pears et al., 2012; Sawyer & Dubowitz, 1994). These non-significant findings may be due to the presence of

other variables in analyses; indeed placement stability, type, duration may be endogenous and confound analyses.

The mixed findings here may indicate that placement mobility operates through other variables such as attendance or school transfers (see below in 4.4). Zorc et al. (2013) examined the relationship between placement instability and attendance in greater depth. They found that attendance rates decreased in a stepwise fashion as placements varied from 'early stability' (achieving placement stability within 45 days) to 'late stability' (stability achieved between 45 days and 9 months). Children with unstable placements were 37% more likely to be absent than children who experienced early stability.

Placement type

This study is only concerned with children in kinship and foster care; studies with samples of children in other placement types were excluded. Eighteen studies comparing the outcomes of children in foster care and kinship care were identified. All but five of these were included in another large meta-analysis which found no overall effect of kinship care on educational outcomes (Winokur et al., 2014). This large and well-designed meta-analysis (by CASP standards) provides strong evidence for this claim. Of the studies not included in this review, four found no difference between the outcomes of children in kinship and foster care (AIHW, 2007, 2011; Sebba et al., 2015; Townsend, 2012). The final study, Font (2014), set out to determine the causal impact of being in kinship care, compared to foster care on reading, maths and cognitive skills. Because randomisation to placement type is not possible (kin carers may not be available), a number of statistical tools, including propensity score matching and instrumental variables, were used to account for selection bias and other potentially confounding variables. Findings were mixed, but estimates which were statistically significant, were all in the same direction: compared to children in foster care, children in kinship care were higher performing at time 1, but their performance decreased more dramatically than their peers over time. This downward trend was particularly pronounced for children in kinship care who were not high functioning at time 1. These findings may, however, reflect the particular context of the study.

Placement out of area

Sebba et al. (2015) was the only study to look at young people placed out of area (outside the regional boundaries of the authority responsible for their care). In this study, out of area placements did not predict outcomes at age 16.

The characteristics and involvement of kin and foster carers

Qualitative research has found that carers play an important role in supporting children in care achieve academic success (Dickson, Sutcliffe, & Gough, 2010; Martin & Jackson, 2002; Sinclair, 2005), so it was expected that carer characteristics or behaviours would be linked to greater attainment in studies included in this review. Nine studies were identified for inclusion.

Six studies found evidence of a positive association between caregiver involvement, including aspirations and expectations, and educational outcomes (Burley & Halpern, 2001; Cheung et al., 2012; Flynn et al., 2013; Pears et al., 2010, 2012; Wise et al., 2010). In Burley and Halpern (2001), Cheung et al. (2012), Pears et al. (2010) and Wise et al. (2010) caregiver involvement in schooling (for example helping with homework) was positively associated with higher attainment. The evidence on school based involvement is mixed: in Pears et al. (2010) school and home based involvement in amalgamated in the same measure. In Cheung et al. (2012) and Wise et al. (2010), school based involvement is not a significant predictor of school performance, but in Flynn et al. (2013) it was associated with better average marks. In Pears et al. (2012), the only study to use a validated measure of involvement, namely the 10-item Attachment to Parent subscale of the Inventory of Parent and Peer Attachment, caregiver support predicted better academic performance for girls in foster and kinship care around the transition from primary to secondary school. In Pears et al. (2010), caregiver involvement also fully mediated the relationship between maltreatment and social-emotional competence.

In Heath et al. (1994), children placed with a foster parent with a high academic achievement performed slightly better in reading but not in maths or vocabulary tests than children placed with carers with lower levels of education. Reading scores did not change over time however, and selection bias cannot be ruled out. Pears et al. (2010), Sawyer and Dubowitz (1994), Wise et al. (2010) and Zima et al. (2000) found that the educational background of the carer did not predict the educational outcomes for children in their care. Moreover, in Wise et al. (2010) caregiver gender and age were also not related to outcomes.

Heath et al. (1994) examined the relationship between social class (categorised as “working” or “middle” class) of the carer and children’s educational outcomes at three time points. There was no difference in attainment between children in care placed with foster carers of different social class. The authors conclude that being placed in a middle class family does not provide any particular benefits to children with regards to educational outcomes. Samples sizes were small ($n=49$) however and selection bias may influence the results. No other study looked specifically at social class, but Berger et al. (2009) examined other family factors (of a mixed sample including children

in care), such as socio-economic status, level of education of the carers and single parenting, and found that none were associated with educational outcomes.

Finally, Sawyer and Dubowitz (1994) and Berger et al. (2009) found that living with a grandparent was not associated with maths or reading scores. But, in Sawyer and Dubowitz (1994) the number of children in the placement was, so that the more the children in the placement, the lower the reading scores (but not maths scores).

Taken together the findings of these studies build on the evidence of qualitative researchers that carers play an important role in supporting the educational attainment of the children in care (Jackson & Cameron, 2011). These findings reflect the broader literature that the involvement and support of parents plays a positive role in the educational success of children (Goodman & Gregg, 2010; Goodman, Gregg, & Washbrook, 2011; Gorard et al., 2012).

Placement with siblings

Hegar and Rosenthal (2009) found no difference in the academic performance of African-American and Hispanic children in kinship care whether they were placed with a sibling or not. However, if children were in foster care, they performed better when they were placed with a sibling. On the other hand, the combination of kinship and sibling placement predicted lower achievement for white children. The relationship between sibling placements and educational outcomes is likely to be mediated by other variables such as well being, for example if remaining with siblings gives children in kinship care a greater sense of stability. While this study had a strong research design, replicating three way interactions is often difficult so the findings may not be replicable or generalizable.

Social work factors

Relatively few studies – here, three – explored the relationship between social work factors and educational outcomes for children in care despite the important role played by social work professionals.

Burley and Halpern (2001) found that the turnover of social workers did not predict any variation in educational outcomes. Aldgate et al. (1992) found that the initial decisions social workers made with regards to permanence were significant in predicting maths, reading and vocabulary scores. Where decisions indicated the placement was likely to be permanent, children performed better than if they believed the placement was short term only. In Choice et al. (2001) having plans for reunification with the birth family was associated with worse educational outcomes. The latter two findings suggest that children's

expectations about placements are significant in predicting achievement; this may be an important finding for social work practice.

4.4. The school experience of children in care

Relatively few studies explored the role of schools in children's educational outcomes.

School transfers

Like placement instability, school mobility is disruptive to the education of children in general (Heinlein & Shinn, 2000; Mehana & Reynolds, 2004). In Burley and Halpern (2001), attending multiple schools in the same academic year was associated with a 9 to 12 percentile ranking decrease in test scores between grade 3 and 9. Conger and Rebeck (2001) found that there was a small but significant relationship between changing school and lower maths test scores, but not reading, scores. In Sebba et al. (2015) school changes in the two years before exams were also associated with lower outcomes. Three studies found no link between school mobility and educational achievement (Heath et al., 1994; Perzow et al., 2013; Zima et al., 2000). Finally, Zorc et al. (2013) examined the relationship between placement and educational stability and attendance. This study found that school transfers were not an independent predictor for attendance. However, changing school was closely related to placement stability. The paper argues that stabilising care placements would be sufficient to reduce school absences. This was the only study to examine the relationship between placement and school stability and outcomes. More research is needed to assess these pathways and relationships and determine how they affect educational outcomes.

Children's educational aspirations and feelings about school

Of the few studies bearing on this question, Burley and Halpern (2001) and Shin (2003) found a significant positive relationship between high aspirations and school success.

In Pears et al. (2012), feelings of self-competence (the child's reported ability to perform well within and across domains) did not predict higher academic competence. In a later study, Pears et al. (2013) examined the association of behavioural engagement (attendance), affective engagement (feelings about school, teachers and peers) and cognitive engagement (efforts made to learn and abilities to regulate these efforts) with academic competence. Greater affective and cognitive engagement were associated with higher

academic competence, but there was no independent effect of behavioural engagement (attendance) on academic outcomes. Greater cognitive engagement was also linked to fewer behavioural problems. The study also examined the relationship between maltreatment and academic outcomes through affective engagement. Findings indicate that being in foster care was associated with lower levels of affective engagement but that affective engagement predicted greater school success. Promoting positive feelings towards school, and greater school engagement in general, for children in care may be an important pathway to better school outcomes.

In the general population, evidence on the role of the attitudes of children to education in predicting outcomes is mixed (Gorard et al., 2012). These studies suggest this research should be extended to children in care.

Other school related factors

While this review accepted studies that used grade retention, attendance and exclusions as outcomes, several included studies examined the relationship between these variables and attainment.

Burley and Halpern (2001) found that children in care had roughly double the grade retention rates of other children in their school. Furthermore, grade retention was associated with 7.7 to 16.3 percentile ranking decrease in reading scores across grades 3 to 9. In Flynn et al. (2013) grade retention predicted worse outcomes in a regression model, but not when previous attainment was held constant. Conger and Rebeck (2001) found that increased attendance predicted better reading and maths scores for children in care. Similarly, Sebba et al. (2015) found that absences (particularly unauthorised) and exclusions explained important variation in exam scores at age 16. In contrast, in Evans (2004) grade retention was not a significant predictor of average achievement and in Zima et al. (2000) attendance did not predict grade level.

In Heath et al. (1994) teachers' low expectations of children were not associated with lower scores in reading, writing or maths at single time points or over time. Shin (2003) found that positive school experiences were associated with better reading scores in bivariate analyses. However, these associations disappeared in regression analyses, after controlling for children's aspirations for education, involvement in special education, past performance and extracurricular activities as well as other factors such as mental health.

Heath et al. (1994) and Burley and Halpern (2001) both investigated whether receiving extra help was linked to academic outcomes. In Heath et al. (1994) children receiving extra help had poorer academic outcomes than those who did not receive help, but their scores appeared to improve over time; the authors infer that teachers are able to identify children who need extra support and provide support which enabled them to catch up, though it is not clear

whether these children closed the gap with their peers. In Burley and Halpern (2001) children receiving extra support had worse outcomes than young people who didn't. This might be because help is targeted at young people in significant difficulty. These findings should be examined in conjunction with more detailed studies on academic support for children in care (i.e. tutoring interventions) which seem to offer promising results (Flynn, Marquis, Paquet, Peeke, & Aubry, 2012; Forsman & Vinnerljung, 2012; Liabo et al., 2012).

Finally, two studies examined school type. In Sebba et al. (2015) children who were in non mainstream schools (particularly those in special schools, but also young people in pupil referral units and alternative provision) at age 16 had lower attainment than children in care in mainstream school. In Pears et al. (2010) children in a private or magnet (public but specialised) schools performed marginally better than those in public or specialised treatment school (at the $p < .10$ level), but outcomes were not related to average class size or percentage of teachers with a master's degree or higher.

Taken together these studies indicate that children in care's experiences in school are multifaceted and complex. Overall, there were far fewer studies on the role of schools and teachers and children's experiences of school, than there were of children's care histories. Further research is necessary to paint a clearer picture of how schools can affect the education of children who are in care.

5. Summary of main results

This review charts a comprehensive summary of the factors associated with educational outcomes for children in care. To the authors' knowledge, it is the only review of its kind.

There were over seventy different factors reviewed; these included individual, peer and family level characteristics, social work and care history variables and school level factors. The review did not identify any study which examined the relationship between wider policy or structural factors and educational outcomes. All included studies examined at least one individual characteristic and its relationship to educational outcomes. Among these, there appeared to be some consensus that male gender and minority ethnicity predicted poorer attainment. Moreover, the review suggests that behavioural problems and special educational needs place children in care at risk of academic difficulties, and that children in care with special educational needs appear to be at greater disadvantage than children with special needs in the general population.

As has been highlighted in previous research, there is a dearth of potentially significant information about birth families. In this review, four studies contained some – limited – data on birth families. Greater information about birth families is crucial to understand the trajectories of young people and how these interact with care histories to affect educational outcomes.

In terms of placement factors, there was little evidence that any single factor had a particularly strong association with educational outcomes. Age at entry may be linked to educational outcomes but evidence was mixed, as were the findings for length of time in care, placement instability and other social work factors (for example number of social workers). In terms of placement type, almost all studies pointed towards no difference between kinship and foster placements but Font (2014) found some evidence to suggest that children in kinship care face greater risks of low achievement. Overall, the mixed evidence may be a reflection of the heterogeneity of the included studies, in terms of samples, concept definitions, study designs, contexts, methodologies and outcomes. Moreover, the results from multivariate analyses, most frequently regression analysis, are also likely to be influenced by the covariates selected. Rare were the studies that used the same covariates: the addition of one or more variables to an equation may unexpectedly change findings and in some cases the direction of other relationships.

Several studies examined the role that carers play in supporting the education of children they care for. There appeared to be consensus that a caregiver involvement in schooling was associated with higher attainment. This finding is perhaps not surprising as supportive adult relationships have been

found to be important for children in the general population as well (Gorard et al., 2012), but it is significant in this context given the central role of carers in children's fostering experiences. Carer attributes may thus be acting as a protective factor. Likewise, children's aspirations and school engagement may also provide a buffer against earlier adversity.

Evidence on school level factors indicates that children in care experience a high number of school transfers. However, findings were mixed as to whether this had a deleterious effect on outcomes or not. Included studies also highlight the fact that children in care experience grade retention and attendance problems at higher rates than their peers in the general population; however, associations with tests scores were not consistent across studies.

All included studies were critically appraised to determine whether results could be trusted and to guide commentary where findings from included studies contradicted each other. Overall, however, with the exception of Font (2014), there were few instances where critical appraisal findings could confidently support the claims of one or more studies over others. The strength of evidence was similar across studies while most suffered some weaknesses, which affected conclusions. For example, a number of studies included children in the general population in analyses but did not perform interaction analyses to determine how the factor was associated with outcomes for children in care specifically. Contradictory findings may thus arise from the different samples, methods or contexts of studies.

6. Conclusion

6.1. Strengths of this review

This review makes an important contribution to the literature on the education of children in care. Indeed, it provides a comprehensive overview on the state of the evidence on factors associated with educational outcomes and in so doing provides the platform for future research about mechanisms underlying low achievement.

Secondly, the review contributes to knowledge on risk and protective factors for children in care. Knowledge about risk and protective factors is essential for the development of effective interventions. Current interventions for children in care have shown limited success; strengthening the evidence on risk and protective factors is therefore key to creating better interventions. The findings from this paper build on the results of previous reviews of risk factors (Bhatti-Sinclair & Sutcliffe, 2012; Oosterman et al., 2007; Simkiss, Stallard, & Thorogood, 2012) and educational outcomes for maltreated children (Romano et al., 2014; Scherr, 2007; Stone, 2007; Trout et al., 2008).

Finally, the review adds to the literature (including systematic reviews) on risk factors. The sensitive search strategy identified an important number of factors hypothesized to be associated with educational outcomes for children in care. A number of challenges were encountered however, in conducting the review, most notably, with respect to synthesis of heterogeneous methodologies, contexts and findings, a common problem with such reviews. There is a growing interest in systematic reviews of risk factors, how they are conducted, what the challenges and opportunities are and how they can contribute to knowledge (Murray et al., 2009; Shenderovich et al., 2016). It is hoped that the findings and discussion of this paper can contribute to future studies and reviews of risk factors.

6.2. Limitations of the review

The aim of this review was to identify factors associated with educational outcomes; it did not identify or specify any factors a priori. Although the search terms were designed to maximise sensitivity, it is likely that the review did not identified all relevant studies. Moreover, the search strategy limited studies to children in care, but in doing so may have filtered out studies where children in care were a subsample of the population in question. Future systematic reviews may look at the relationship between one factor and educational outcomes. These may also be more conducive to conducting a meta-analysis.

The review did not examine genetic or other biological factors that may influence educational outcomes. This is a particularly important area of research as evidence emerges of genetic factors involved in anti-social behaviour and mental health, as well as on-going debates about 'intelligence' (see for example Jaffee, Strait, & Odgers, 2012).

Only a small number of countries were represented in the studies accepted for inclusion, the majority from the USA. This limits the generalisability of the findings. Future research may broaden the contexts from which research is drawn for example through multi-country collaborations.

The review did not include children in residential care or qualitative research findings as these were outside of the scope of this paper. However, such studies may offer important clues about other risk and protective factors associated with educational outcomes. The review also only includes studies in English.

6.3. Implications for practice

The mixed findings do not lend themselves to straightforward prescriptions or recommendations for practice. However, some themes emerge.

The findings indicate that certain groups of children may be more at risk of poor outcomes. These groups include boys, those from minority ethnicity groups and children in care with special educational needs. Practitioners may wish to pay particular attention to the specific needs of some groups of young people.

The review also identified several studies that found an association between carer support and children's educational outcomes. This is a promising finding for practice as it may inform future interventions or work with carers more generally. Findings about the effectiveness of existing interventions with carers are mixed however (Briskman et al., 2012; Flynn et al., 2012; Turner & Macdonald, 2011). New interventions, for example Fostering Achievement for All, are currently being developed and evaluated, to examine whether they can support greater educational success by working with carers. To support the development and implementation of such interventions, further research is required to first identify the processes by which carers can promote educational outcomes and then how these findings can be used to develop interventions.

6.4. Implications for Research

While there exists a large body of research on the education of children in care, more evidence is needed to understand the processes underlying the problem of low achievement. This implies the need for research using large samples, more sophisticated statistical models and longitudinal designs, which should include detailed information about the characteristics of children, their families, placements and environment. However, research in this field is fraught with difficulties of recruitment, use of data tends to be extremely sensitive, and local samples of children are often small. Another strategy may analyse existing data from interventions to look for causal relationships. However, resistance to randomisation for example, makes interventions, implementation and evaluation a challenge (Dixon et al., 2014; Mezey et al., 2015). Despite this, advances continue to be made by the accumulation of findings in reviews like this one, even where individual studies cannot make strong recommendations. As more research is produced, there may also be scope to undertake a more focused (by geography, population or risk factor) systematic review and meta-analysis. Future research will need to provide more detailed data about children in care to make this possible. For example, in this review length of time in care was used as a proxy for length of current placement, care period, time in care overall and other variations that could have been analysed separately had more detailed records been available. It would also be helpful if samples of children in care were more clearly identified. There exists a large literature on child maltreatment, for example, but it is not always clear whether participants are or ever were in care. Greater clarity may also allow for more subgroup analysis, by age or gender for example. Research should also make the practical significance of findings clear. Several studies included in this review omitted to do this (and it

was not immediately obvious from the data), thus limiting interpretation. This review also identified several gaps in the literature in particular around the link between well being or pre-care experiences and educational outcomes. Greater information about pre-care experiences is particularly important in order to understand the influence of these early experiences on educational achievement, and to explore how these interact with later experiences in care (O'Higgins et al., 2015).

Literature on risk factors for low educational outcomes for disadvantaged children in the general population could offer a different approach for identifying risk factors for children in care. Children in care are often excluded from these studies, or constitute only a very small proportion of the population, but there may nonetheless be much to learn from the findings. Indeed, children in care are more likely to come from poor or disadvantaged backgrounds where substance misuse, domestic violence and maltreatment occur. There exists a rich literature on the link between maltreatment and educational outcomes, for example, which is not limited to children in care (Leiter & Johnsen, 1994; Romano et al., 2014; Shonk & Cicchetti, 2001). Risks identified in research on children in the general population could be further studied to assess their importance for children in care.

Finally, as research evidence accumulates and longitudinal studies become more prevalent, future reviews should consider inclusion criteria limited to longitudinal studies. This would allow risk and protective factors, rather than just correlates, of educational outcomes to be identified. A risk and protective factors approach, proposed by Murray et al. (2009) or Luthar, Cicchetti and Becker (2000) would give greater weight to analyses and interpretations. Future studies may also distinguish between malleable and fixed risk factors and focus on only one of the two. Such an approach may also motivate more sophisticated designs that aim to determine the exact nature of the risk as well as interactions between risk factors. By adopting a risk and protective factors approach, researchers would facilitate the development of intervention based on their conclusions.

In summary, this review contributes to the literature on the educational outcomes for children in care by systematically identifying risk and protective factors for educational achievement. Identifying these risk and protective factors is necessary to develop evidence based logic models to inform the development of effective interventions. Over 70 correlates of educational outcomes were identified in this review and these were broadly grouped, according to the ecological framework, by individual, family, care and school factors. The findings were mixed but suggest that boys, those belonging to minority ethnic groups and children with special educational needs in care are at particular risk of poor

outcomes. There was no clear pattern of association between age at entry into care, length of placement, placement type or school factors and attainment. Carers and children's aspirations play a potentially important role these may act as protective factors. These mixed factors are likely a reflection of the diversity of contexts, samples and methodologies included in this review. The findings of this review suggest that future research should use longitudinal research designs and should also assess whether the risk factors for low educational attainment in the general population apply to children in care. These two research directions will hopefully allow risk and protective factors to be identified so that ultimately interventions can be put in place to help children in care succeed in school.

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Appendix A: Table of included studies

Exact *p*-values are provided where available in original studies, alternatively the following notation is used †*p*<0.10, **p*<0.05, ***p*<0.01, ****p*<0.001

Study	Sample	Methodology	Covariates	Findings
AIHW (2007) Australia	895 children in care in years 3, 5 & 7	t-test, ANOVA Linear regression Interaction (x)	State, gender, indigenous status, placement type and length of time on current guardianship/custody order.	Outcomes: reading and numeracy tests Ethnicity (reference: white Australian) $\beta = -.359^*$ (reading) and $\beta = -.439^*$ (numeracy) Length of time in care <i>r</i> ranged from .114 to .204 (<i>p</i> < 0.05), <i>ns</i> in multivariate analyses Not significant: Gender, placement type
AIHW (2011) Australia	4,673 children in years 3 / 5 / 7	Longitudinal, t-test, ANOVA Regression Interaction (x)	State, gender, indigenous status, placement type and length of time on current guardianship/custody order.	Outcomes: reading and numeracy tests 2003 to 2006 Ethnicity (reference: white Australian) OR= -.529*** to OR= -.251 (reading). In longitudinal analyses, Aboriginal CYP less likely to meet expected benchmarks. Number of placements $\beta = -.225^*$ to $\beta = -.155^*$ for outcomes 2003 to 2006. In longitudinal analyses, there was a negative association between number of placements and outcome. Not significant: Gender, placement type, length of time in care
Aldgate et al. (1992) England	49 children in care age 10 - 14	Regression	Initial plan made by social work (re permanence), reason for entering care, length of time in care, number of prior placements, Contact with birth family, expectations about long term stability	Outcomes: maths, reading or vocabulary test scores. Reason for entry In care for abuse or neglect associated with lower test scores. Two years later, no differences between reason for entry. Initial expectations about placement length $\beta = .31^{**}$, <i>ns</i> predictor for progression. Not significant: Length of current placement, number of placements, frequency of contact with birth mother
Berger et al (2009)	342 children in care age 4 to 17	Regression, Residualized	Time in care, placement type, number of placements	Outcomes: standardized test scores (K-BIT) No significant predictors

Study	Sample	Methodology	Covariates	Findings
USA	form	change, simple change, diff in diff, fixed effects		
Berrick et al. (1994) USA	600 children in care age 7 to 8	Chi-square	None	Outcome: <u>grade retention</u> Placement type 31% CYP in foster care had repeated a grade vs 23% in kinship care 23%.
Brooks & Barth (1998) USA	258 school age children in kin / foster care	ANOVA	Age	Outcomes: <u>Grade retention</u> No significant predictors
Burley & Halpern (2001) USA	4,559 children in care across grades 3, 6 or 9.	Linear Multiple regression	Gender, ethnicity, special educational needs, entered care in last 12 months, average placements per year, average caseworkers per year, foster care type (basic / specialised), length of time in care, highly capable programme, grade retention, watches TV at home, language spoken at home, uses computer at for schoolwork, homework help, extra assistance with reading / maths and attended another school this year For educational aspirations and plans to attend university , the full sample (including children not in care)	Outcomes: <u>standardized test scores in reading and maths</u> Entered care last 12 months: $\beta = -16^{**}$ (in Grade 9), $\beta = -8.5^{**}$ (in Grade 6), ns at grade 3 Ethnicity: (reference category white ethnicity) $\beta = -7.4^{**}$ to $\beta = -12.6^{**}$ for Native American CYP grade 3 to 9. $\beta = 17.9^{**}$ for Asian CYP in grade 6 (ns otherwise). $\beta = -10.1^{***}$ to -6.8^{**} for African American CYP grade 3 to 9. ns for Latino CYP in grade 3 and 9. Special educational needs: $\beta = -20.7^{***}$ to $\beta = -19.8^{***}$ from grade 3 to grade 9 Highly capable programme: $\beta = 44.4^{***}$ to $\beta = 56.6^{***}$ from grade 3 to grade 9 Grade retention ns (grade 3), $\beta = -7.0^{***}$ (grade 6) $\beta = -5.6^{***}$ (grade 9) Watches 5hours+ TV per day: ns at grades 3 and 6, $\beta = -10.1^{***}$ (grade 9) Language spoken at home $\beta = -19.8^{*}$ to $\beta = -11.1^{***}$ for grades 3 to 9 Uses computer for schoolwork: $\beta = 5.26^{**}$ (in Grade 6), $\beta = 6.0^{***}$ (in Grade 9), ns grade 3 Homework help: $\beta = 6.0^{**}$ (grade 3) $\beta = 10.0^{***}$ grade 6, ns at grade 9 Receives assistance with reading / maths: $\beta = -10.1^{***}$ to $\beta = -14.0^{***}$ for grades 3 to 9 Attended another school this year $\beta = -7.9^{***}$ (grade 3) / $\beta = -4.3^{*}$ (grade 6), ns (grade 9). Educational aspirations $\beta = 4.0^{***}$ (grade 6), $\beta = 3.4^{***}$ (grade 9). Plans to attend university $\beta = 2.8^{***}$ (grade 9)

Study	Sample	Methodology	Covariates	Findings
			was used and interactions analyses were not conducted.	Not significant: Gender, age at entry, length of time in care, average placements per year, average caseworkers per year, foster care type
Cheung et al. (2012) Canada	687 young people in foster care age 10 to 15	Two level multilevel model	Placement level: literacy support, academic expectations and school based involvement Child level: age and externalising behavioural problems	Outcome: academic achievement 15% of the variation in youth's scores is explained by differences between placements. Age: $\beta = -.258^*$ Gender: $\beta = .171^*$ (girls coded as 1, boys as 0) Externalising behaviours score $\beta = -.193^*$ Caregiver home based involvement $\beta = .107^*$ Caregiver school based involvement $\beta = .068^*$ Placement literacy environment $\beta = .098^*$ Carer academic expectations involvement $\beta = .253^*$
Choice et al. (2001) USA	303 children in care age 5 to 18	Linear Multiple regression	Age, emotional problems, learning disability, needs an individual educational plan, has an individual education plan, lives in low income county and has a plan for reunification with family	Outcome: average grades Age: OR: .87 (95% CI .79-.95) $p = .003$ Emotional problems: OR: .52 (95% CI .37-.72) $p = .000$ Learning difficulty: OR: .40 (95% CI .17-.93) $p = .034$ Has an individual education plan OR: .16 (95% CI .07-.36) $p = .000$ Needs an individual education plan OR: .11 (95% CI .03-.43) $p = .001$ Is the child living in low income county OR: .13 (95% CI .03-.51) $p = .003$ Plans for reunification OR: .23 (95% CI .07-.79) $p = .019$
Colton & Heath (1994) England	49 CYP in care age 10 - 14 (same as Aldgate et al., 1992)	T-tests	None	Outcomes: maths, English and vocabulary test scores At T1 children above cut-off for emotional behavioural problems had lower attainment than those below cut-off but difference at T2 and T3 was not statistically significant, on parent questionnaire. No statistically significant differences on teacher questionnaire.
Conger &	16,183 children	Multiple linear	Age (not shown), gender, ethnicity,	Outcomes: attendance, reading, maths tests.

Study	Sample	Methodology	Covariates	Findings
Rebeck (2001) USA	in care, age 5 to 18	regression	school variables, placement variables, reason for placement, placement type, time in care, placement change, school change, attendance	<p>Gender (girls = 1, boys = 0): $\beta = .066^{**}$ (reading scores), otherwise ns</p> <p>Ethnicity (reference: Hispanic): $\beta = 1.175^{**}$ for white children (attendance). $\beta = -.041^{\dagger}$ for African American CYP (reading), $\beta = .071^{\dagger}$ for white children (maths) otherwise ns.</p> <p>Reason for entry (reference is voluntary entry):</p> <p>Abuse / neglect $\beta = 1.124^{**}$ (attendance), $\beta = 0.130^{**}$ (reading), otherwise ns.</p> <p>Behavioural problems $\beta = -3.876^{**}$ (attendance), otherwise ns.</p> <p>Length of time in care $\beta = -4.585^{**}$ in care part of semester / $\beta = -2.754^{**}$ in care none of semester (Attendance). $\beta = .001^{\dagger}$ (reading) otherwise ns.</p> <p>Number of placements $\beta = -1.318^{**}$ (attendance), otherwise ns.</p> <p>Placement type Attendance increased in foster and kinship care, by 4.4% and 7.8% respectively. And $\beta = -2.684^{**}$ for residential care vs foster care (attendance), ns otherwise.</p> <p>School transfer: $\beta = -.053^{*}$ (maths), ns (reading)</p> <p>Attendance $\beta = .004^{**}$ (reading) and $\beta = .005^{**}$ (maths)</p>
Evans (2001) USA	3483 children in care, age 6 to 18.	ANOVA, regression	Age, gender, ethnicity, IQ, height and weight, reason for entry	<p>Outcomes: <u>maths reasoning, maths calculation, basic reasoning, written expression</u></p> <p>Gender: being male was associated with poorer outcomes</p> <p>IQ Low IQ was a significant predictor of severe discrepancy (between IQ and achievement).</p> <p>Height Low height was associated with lower attainment (details not provided)</p> <p>Reason for entry (abuse, behavioural problems, court ordered). Neglect group: significantly higher overall rate of underachievement. Predictor of written expression discrepancy size.</p> <p>Not significant: age, ethnicity, weight</p>
Evans (2004) USA	390 children in foster care who left and re-entered care	Chi-square, regression	Gender, ethnicity, age at entry, length of time in care, achievement in first placement, age at re-entry Note: Special education status was	<p>Outcomes: <u>Overall achievement</u></p> <p>Special educational services (yes, no, unknown) predicted lower achievement.</p> <p>Grade retention Grade retention predicted lower average achievement</p> <p>Not significant: Age at entry, length of time in care</p>

Study	Sample	Methodology	Covariates	Findings
			unknown for 48% of participants.	
Flynn et al. (2013) Canada	1106 young people in care, age 12-17	Hierarchical multiple regression	Gender, placement type, grade retention, cognitive impairments, SDQ score, caregiver school involvement, caregiver aspirations, internal developmental assets, prior attainment.	<p>Outcomes: average marks and school performance</p> <p>Age: $r = -.07^*$, $\beta = -.08^\dagger$ for school performance.</p> <p>Gender: (1 = Female, 0 = Male) $r = .13^{***}$ to $r = .18^{***}$ & $\beta = .07^\dagger$ to $\beta = .11^{**}$</p> <p>Well being (internal development assets) $r = .28^{***}$ to $r = .43^{***}$ and $\beta = .10^*$ to $\beta = .25^{***}$</p> <p>SDQ Total Difficulties $r = -.19^{***}$ to $r = -.37^{***}$ and $\beta = -.13^*$, $\beta = -.22^{***}$, otherwise ns.</p> <p>Cognitive impairment index (1=none, 4= high): $r = -.23^{**}$ to $r = -.11^{***}$, all β ns</p> <p>Placement type $r = .07^*$ (foster care). $r = .07^*$ (kinship care). ns in multivariate analyses.</p> <p>Caregiver school involvement $r = .10^{**}$, $r = .16^{***}$ / r ns otherwise. $\beta = .10^*$ otherwise ns.</p> <p>Caregiver aspirations $r = .16^{***}$ to $.35^{***}$. $\beta = .10^*$ to $.23^*$. Otherwise ns.</p> <p>Grade retention $r = -.10^{**}$ to $r = -.13^{***}$ and $\beta = -.08^\dagger$, otherwise ns.</p>
Font (2014) USA	1,215 young people in care age 6-17	Regression (OLS), change score models, propensity score (PS) matching and Instrumental variables (IV)	Placement type ("mostly kinship" or "mostly foster care") is the main predictor. Covariates for which details are not presented were gender, ethnicity, age, age at entry into care, disability, long term health conditions, reason for entry into care, parental substance misuse, birth family risk factors, population density, geographical location, community disadvantage	<p>Outcome: Maths, Reading (Woodcock), IQ: Verbal and non Verbal Cognitive Test (K-BIT)</p> <p>OLS models:</p> <p>Model with PS weighting: Reading: $-.147^*$, Maths: $-.047$, IQ: $-.216^{**}$</p> <p>Model with IV and PS weighting: Reading $-.507^*$, Maths: $-.042$, IQ: $-.419^\dagger$</p> <p>Residualised changed models:</p> <p>Model with PS weighting: Reading: $-.136^*$, Maths: $-.102$, IQ: $-.181^{***}$</p> <p>Model with IV and PS weighting: Reading: $-.389^\dagger$, Maths: $-.056$, IQ: $-.219$</p> <p>Simple change models:</p> <p>Model with PS weighting: Reading: $-.112^*$, Maths: $-.131^\dagger$, IQ: $-.189^{**}$</p> <p>Model with IV and PS weighting: Reading: $-.289$, Maths: $-.010$, IQ: $-.154$</p>
Geenen & Powers	70 children with special	t-test, ANOVAs	Special educational needs (SEN) length of time in care, ethnicity, number of	<p>Outcomes: GPA, attendance, credits earned, grade retention, maths and reading test scores</p> <p>Special educational needs CYP in foster care and SEN group had lower cumulative grade</p>

Study	Sample	Methodology	Covariates	Findings
(2006) USA	educational needs in foster care, 88 in foster care no special needs		foster care placements and type of placement.	point average scores, had lower reading and maths test scores and earned significantly fewer credits toward graduation than CYP in general population. Number placements $r = -.14^*$ (GPA), $r = .23^*$ (reversed scored maths scores). Otherwise ns. Placement type CYP foster care had better outcomes (no detail of figures). Otherwise ns. Not significant: Ethnicity, length of time in care
Heath et al. (1994) England	49 CYP in care age 10 - 14 (same as Aldgate et al., 1992)	T-tests	No detail	Outcomes: maths, English and vocabulary test scores Age: Older children performed worse relative to younger children in care (no detail) Level of education of the carer small differences (reading) Low expectations Teachers' low expectations of children not associated with outcomes Not significant: special educational needs, social class, number of schools attended
Hegar & Rosenthal (2009) USA	1415 CYP in foster care and kinships care	Regression, interaction	Gender, ethnicity, placement type, low income county and interactions: Placement type x Ethnicity x Placement with sibling	Outcomes: school performance Ethnicity: ns for Black children, $\beta = .70^{**}$ for Hispanic children, $\beta = -.57^{**}$ other ethnicities Placement type ns predictor. $\beta = -.069^*$ for kinship x sibling interaction: The interaction of kinship care, sibling placement and ethnicity (white children) was also significant. Placement with sibling ns predictor. See above for interactions. Not significant: Age, gender, low income county
Iglehart (1994), USA	1642 CYP in care age 16	Proportions	None	Outcome: below or at grade level 36% of children in kinship care performing below grade level vs 42% in foster care
Kirk et al. (2012) USA	550 CYP in foster care	t-test	None	Outcomes: grade point average Gender: Girls reported higher grades ($t(548) = -4.42, p = .006, d = -.38$) than boys. 69% of girls reported GPA of 3.0 or above, compared to 55.0% of boys.
McClung & Gayle (2010) Scotland	588 CYP in care in two local authorities	Logistic regression	Gender, age at entry (before or after 12), reason for entry (parental reasons or reasons related to child), placement	Outcomes: Scottish school educational outcomes Gender: Girls performed better than boys (ES from .067 to .113). ns in multivariate analyses. Reason for entry (parental or child reasons): in care for parental reasons associated with

Study	Sample	Methodology	Covariates	Findings
			type Note: some of the analyses were performed with samples of children in care and children not in care and no interaction analyses were carried out.	better outcomes for all levels/qualifications (ES ranged from 4.68 to 10.58, $p < .05$). Age on entry Entered before age 12 more likely to obtain qualifications than CYP who entered after 12 (ES from .154 to .233). Entering before 12 associated with better educational outcomes in multivariate analyses (ES from 4.11 to 10.69, $p < .05$). Placement type Children in foster care performed better than in other placements.
McNichol & Tash (2001), USA	268 CYP in foster care	ANOVA	None	Outcomes: cognitive test scores Prenatal / postnatal exposure to parental substance Children exposed prenatally had lower (verbal, performance and full scale) IQ at T ₁ ($F[2,210]=3.18$, $p < 0.05$), but higher IQ at T ₂ compared to children exposed to drugs in early childhood (ANOVA $F[2,78]=3.36$, $p < 0.05$). Not significant: gender
Mitic & Rimer (2002) Canada	3523 school age children in care	Chi-square and logistic regression		Outcomes: reading, writing and numeracy At grade 4, 7 and 10, non-Aboriginal children scored higher than Aboriginal CYP (OR ranged from 2.64 to 3.46, $p < .001$).
Pears et al. (2010) USA	85 maltreated children in foster care	Path analysis	Gender, IQ, maltreatment and placement, carer involvement in schooling, inhibitory control, average classroom size, teachers' qualification level and school type	Outcomes: academic achievement Gender: r ns and $r = -.16^*$ (in path analysis) Inhibitory control: $r = .35^{**}$ and $r = .22^*$ (in path analysis) IQ $r = .50^*$, the direct path from IQ to academic competence was significant (t not provided) and the indirect path from IQ to outcome, through inhibitory control was also significant. Carer involvement $r = .30^{**}$, also significant in the path analysis. But indirect path of maltreatment to academic competence through caregiver involvement was not significant. Average classroom size, percentage of teachers with a master's degree or higher and school type $r = .17^+$ (school type), otherwise ns. In multivariate analyses, all ns.
Pears et al. (2012)	75 girls in foster / kinship care	Latent Growth Curve Analysis	Placement type Risk factors: Poor self-regulation,	Outcomes: academic competence at T1, T2 and T3 Poor self-regulation $r = -.40^{**}$ (T1), $r = -.50^{**}$ (T2), $r = -.41^{**}$ (T3) and T1 poor self-

Study	Sample	Methodology	Covariates	Findings
USA	primary to secondary school		Placement changes Promotive factors: Caregiver support	regulation significantly ($-.59, p = .00$) predicted the intercept factor Caregiver support $r = .21^+$ at T3. ns at T1 / T2. Caregiver support positively predicted the slope factor in the LGC model. Self-competence (student getting on at school) $r = .20^+$ to $r = .40^{**}$. Multivariate analyses ns. Not significant: Number of placements
Pears et al. (2013) USA	93 maltreated children in foster care	SEM	Gender, maltreatment, risk behaviour (substance misuse, externalising behaviour, deviant peer association) behavioural school engagement, affective school engagement and cognitive school engagement	Outcomes: academic competence Gender: (1 = Female, 0 = Male) $r = .18^*$ and r is ns (in structural equation model) Risk taking behaviour $r = -.20^*$ (substance abuse), $r = -.38^*$ (externalising behaviours) and $r = -.30^*$ (deviant peers). Latent variable (risk taking behaviours) ns. IQ $r = .25^{**}$ to $r = .60^{**}$ and $\beta = .26$ $p = .002$ to $\beta = .57$ $p < .001$ Behavioural, affective and cognitive engagement $r = .37^{**}$ (affective engagement) / $r = .49^{**}$ (cognitive engagement) otherwise ns.
Perzow et al (2013) USA	149 children in foster care, age 9 to 11years	Regression	IQ, gender, age, number of schools, number of caregivers	Outcomes: IQ, academic performance, teacher and caregiver academic rating, WIAT score Disassociation: $r = -.22^{**}$ & $r = -.20^*$, otherwise ns. $\beta = -.23$ & $\beta = -.15$, otherwise ns. Not significant: IQ, age, gender, number of schools attended, number of caregivers
Petrenko et al. (2012) USA	334 maltreated children in foster care, age 9 to 11years (Same sample at Perzow et al. (2013))	Regression, hierarchical regression, latent class analysis	Sexual abuse, physical abuse, physical neglect, supervisory neglect, severity, prior period in care	Outcomes: verbal and non-verbal IQ scores and academic achievement Reason for entry Model 1 (regression): Supervisory neglect was associated with higher Verbal IQ scores ($\beta = 4.99, t = 2.39, p = .017, sr^2 = .017$). Other subtypes were ns. Model 2 (regression including severity): all subtypes ns. Model 3 (hierarchical regression): the supervisory neglect group had better Verbal IQ scores than the physical neglect group ($\beta = -4.00, t = -2.24, p = .026$). Model 4 (Latent Class models): Children in the Supervisory Neglect class had higher verbal IQ scores than children in the Sexual Abuse/Mixed class ($p = .009, d = 0.55$). No class differences were identified for nonverbal IQ or academic achievement.

Study	Sample	Methodology	Covariates	Findings
				<p>Number of placements Model 1 (regression): $\beta = -3.55$, $t = -2.24$, $p = .026$. Model 2 (regression including severity): $\beta = -3.76$, $t = -2.35$, $p = .019$. Model 3 (hierarchical regression): $\beta = -3.67$, $t = -2.32$, $p = .021$.</p>
Sawyer & Dubowitz (1994) USA	372 children in kinship care, age 5 to 19	t-test	None	<p>Outcomes: reading and maths test scores</p> <p>Age at entry Entering after 12: higher reading / maths scores than entering before.</p> <p>Not significant: Gender, Child is easy/average/difficult, reason for entry, length of time in care, number of placements, caregiver level of education, caregiver employment, caregiver is grandparent: ns</p>
Sebba et al. (2015)	4,849 children in care	Regression, path analysis and multilevel modelling	<p>Gender, ethnicity, SEN, free school meals (FSM), neighbourhood deprivation (IDACI), home language, reason for entry, length of time in care, SDQ, placement changes, school changes, absences, exclusions, placement out of authority, placement type, school type, past achievement</p> <p>The findings presented here are β values of predictors of exam results at age 16 (Key Stage 4), when all covariates are included in the model, including exam scores at age 11 (Key Stage 2).</p>	<p>Outcomes: Progress from exams at age 11 to exams at age 16</p> <p>Gender (reference male): $\beta = -.028^{**}$</p> <p>SEN (reference: none): Autistic Spectrum Disorder $\beta = -0.055^{***}$ / Moderate Learning Difficulty $\beta = -0.027^{*}$, Severe or Multiple Learning Difficulties: $\beta = -0.138^{***}$</p> <p>Behavioural, Emotional and Social / Physical, Sensory and Other Disabilities / Specific Learning Difficulty / Speech, Language and Communication: all ns</p> <p>Strengths and Difficulties Questionnaire Score: $\beta = -.089^{***}$</p> <p>Reason for entry (reference: entry 0-4 or 5-9):</p> <p>Disability: $-.033^{*}$, Adolescent entrant (abuse or neglect) / (other reasons): ns</p> <p>Placement changes after age 11: $\beta = -.076^{*}$</p> <p>Home language at age 16: $\beta = -.038^{*}$</p> <p>Length of latest placement: $\beta = .030$</p> <p>School changes in 2 years before exams: $\beta = -.080^{***}$</p> <p>In non-mainstream school: $\beta = -.272$ (special school) to $-.094^{***}$ (other type).</p> <p>Unauthorised absences: $\beta = -.127^{***}$</p> <p>Fixed and permanent exclusions: $\beta = -.090^{***}$</p>

Study	Sample	Methodology	Covariates	Findings
				<p>Exam scores at age 11: $\beta = 0.253^{***}$</p> <p>Not significant: Ethnicity, Length of time in care, FSM age 7 and 16, Home Language at age 7, IDACI age 7 and 16, Placed out of authority age at 16.</p>
Shin (2003) USA	152 young people in care, age 16.5-17.5	Regression	Aspiration for higher education, problem solving skills, anxiety, depression, loss of control, positive affect, emotional ties, life satisfaction, placement in kinship care, educational planning, special education, school performance, extracurricular activity, positive school experience, hospitalised care, drug abuse	<p>Outcome: <u>standardized test scores in reading</u></p> <p>Well being: negative association between depression, loss of control, emotional ties and outcome. Positive link between life satisfaction and outcome. ns in multivariate analyses.</p> <p>Risk taking behaviour r ns, and $\beta = -.24^*$ for drug use</p> <p>Special education (enrolled in programme or not) $r = -.46^{**}$, ns in multivariate analysis</p> <p>Placement type (kinship care) $\beta = .24^*$</p> <p>Aspirations for education $r = .49^{**}$ and $\beta = .53^{***}$</p> <p>Positive school experience $r = .31^{**}$, ns in multivariate analysis</p> <p>Extracurricular activities $r = .32^{**}$ and $\beta = .25^*$</p> <p>Not significant: age, gender, ethnicity</p>
Stein (1997) Canada	248 children in care, age 4 to 16	t-test	None	<p>Outcome: <u>language and overall performance</u></p> <p>Gender: Boys had slightly higher ratings than girls both outcomes</p>
Townsend (2012) Australia	1,995 children in care, age 6 to 18	ANOVAs	None	<p>Outcomes: <u>literacy and numeracy</u></p> <p>Gender: Girls had higher scores than boys across all years</p> <p>Ethnicity: Aboriginal CYP performed worse than non-Aboriginal children at every year level</p> <p>Not significant: Length of time in care, placement type</p>
Turpel-Lafond (2007) Canada	32,186 all children in care between 1997 and 2005, age 5 to 18	Proportions	Special educational needs, ethnicity, gender	<p>Outcomes: <u>overall performance (reading, writing, numeracy)</u></p> <p>Gender: 26.6% of girls graduate, compared with only 15.9% of boys.</p> <p>Ethnicity: Aboriginal CYP have poorer outcomes than non-Aboriginal 24% of non-Aboriginal CYP graduated from high school, in contrast to 16% of Aboriginal CiC.</p> <p>Special educational needs: 12% of CYP with SEN graduate from high school (vs 34%)</p>

Study	Sample	Methodology	Covariates	Findings
Vinnerljung & Hjern (2011) Sweden	3,062 young people in care	Cox regression	Age at entry into care, parental substance misuse, parental level of education, presence of psychiatric symptoms in parents	Outcomes: <u>academic performance at 16 and 18</u> Gender: Girls had higher mean average grades at 16 than boys. 30% of boys and 25% of girls in foster care had no education beyond the age of 16. Birth parent substance misuse, birth parent mental health problems and birth mother's level of education: All variables were very weak predictors (details not provided) or ns Not significant: age at entry
Weiss & Fantuzzo (2001) USA	490 children in care, age 6 to 8	Linear multiple regression and interaction analysis	Birth risks, maltreatment, in care, poverty	Outcomes: <u>academic competence, attendance</u> Age: OR: .84* (academic competence) & OR: 1.52**** (attendance), CIs not provided. Low birth weight OR: 1.34**** and OR: 1.32*** Single mother OR: 1.60**** to OR: 2.25**** Teenage mother 1.46**** Poverty OR: 1.67**** to OR: 2.43**** Maltreatment: OR: 1.76**** to OR: 1.94**** Not significant: low APGAR score, lead poisoning All interaction analyses of in care status and risk factors were ns.
Wise et al. (2010) Australia	199 children in foster care, age 7 to 17	Stepwise regression	Age, gender, age at first placement, number of placements, well being, carer age, carer school based involvement, carer level of education, carer gender, carer support of child's academic work, carer expectations for education, child functioning and behavioural problems.	Outcomes: <u>grade retention, overall achievement and risk of exclusion</u> Age: $\beta = .17^*$ (risk of exclusion), otherwise β is ns Gender (1=female, 0=male): $\beta = -.19^+$ (grade retention), otherwise β is ns Special educational needs $\beta = -.24^*$ for intellectual disability and $\beta = -.19^+$ for physical disability, β is ns for learning disability / disorder, $\beta = -.16^*$ for ADD (temporary suspension) Carer expectations $\beta = -.50^{***}$ (reverse coded) achievement / $\beta = -.19$ and grade retention Carer support of academic child's work $\beta = .34^{***}$ overall achievement, otherwise ns. Not significant: Age first placement, well being (emotional disorder), number of

Study	Sample	Methodology	Covariates	Findings
				placements, carer age, carer school based involvement, carer level of education, carer gender
Zima et al. (2000) USA	302 children in care, age 6 to 12	Logistic regression	Age, gender, ethnicity, length of time in care, behavioural problems, number of placements, placement type, carer level of education, number of schools attended, attendance	<p>Outcomes: risk of exclusion, academic skills delay, grade retention</p> <p>Age OR: 1.52* (CI 95% 1.19-1.97) (risk of exclusion), otherwise, ns</p> <p>Gender OR: 6.71* (CI 95% 2.53-21.49) (risk of exclusion), otherwise ns</p> <p>Ethnicity: OR: 3.26 (CI 95% 1.57-6.87) for academic skills delay, otherwise ns</p> <p>Behavioural problems (CBCL Total T > 63) OR: 3.37 (CI 95% 1.41-8.25), OR ns for academic skills or grade retention</p> <p>Length of time in care OR: 1.17* (CI 95% 1.01-1.34) for risk of exclusion. Otherwise ns.</p> <p>Number of placements OR: 1.18* (CI 95% 1.01-1.36) for academic skills delay, otherwise ns</p> <p>Placement type OR: 3.04* (CI 95% 1.20-7.35) for living in a group home, otherwise ns.</p> <p>Not significant: Carer level of education, number of schools attended, attendance</p>
Zorc et al. (2013) USA	209 children in foster or kinship care, age 5 to 8	Poisson regression	Age, Gender, Placement stability, behaviour, chronic illness, reason for entry, school changes, placement type	<p>Outcome: attendance</p> <p>Gender: Boys 25.4 days absent vs Girls 19.1 days absent (outcome is attendance),</p> <p>Behavioural problems (CBCL score dichotomised at 83rd percentile): 27.1 days absent compared to 19.5 for CYP who didn't score above cut of. IRR = 1.32 (CI95%, $p = .008$).</p> <p>Chronic illness (yes / no) lower attendance (25.5) than CYP without an illness (21.1).</p> <p>Reason for entry: Neglect (yes/no) ns, Physical abuse (yes/no) ns, Sexual abuse (yes/no) ns</p> <p>Only sexual abuse included in multivariate analyses, IRR was ns.</p>

Study	Sample	Methodology	Covariates	Findings
				<p>Number of placements (stability) early stability: 15days absent; late stability: 22.28; no stable placement (23.1). IRR <i>ns</i> for late stability, IRR = 1.37 (CI95%) for unstable.</p> <p>School changes moderately predicted attendance (no detail of figures).</p> <p>Not significant: Age, ethnicity, placement type</p>

Highlights

- Systematic review identified 39 studies and 70 factors tested for their association with educational outcomes of children in foster or kinship care
- Significant heterogeneity in study findings reflects complex realities of children in care
- Male gender, ethnic minority status and special educational needs were consistent predictors of poor educational outcomes
- Carers' and young people's aspirations appeared to predict greater success