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Relationship between out-of-home care placement history characteristics and educational achievement: A population level linked data study



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ABSTRACT

Studies generally show children who have entered out-of-home care have worse educational outcomes than the general population, although recent research suggests maltreatment and other adversities are major contributing factors. Children's out-of-home care experiences vary and may affect their outcomes. This study examined the influence of placement stability, reunification, type of care, time in care and age at entry to care on children's educational outcomes. We conducted a population-based record-linkage study of children born in Western Australia between 1990 and 2010 who sat State or national Year 3 reading achievement tests ($N = 235,045$ children, including 2160 children with a history of out-of-home care). Children's educational outcomes varied with many aspects of their care experience. Children placed in residential care were particularly likely to have low scores, with an unadjusted OR 6.81, 95% CI [4.94, 9.39] for low reading scores, which was partially attenuated after adjusting for background risk factors but remained significant (OR = 1.50, 95% CIs [1.08, 2.08]). Reading scores were also lower for children who had experienced changes in care arrangements in the year of the test. A dose-response effect for multiple placements was expected but not found. Older age at entering care was also associated with worse reading scores. Different characteristics of a child's care history were interwoven with each other as well as child, family and neighbourhood characteristics, highlighting a need for caution in attributing causality. Although the level of educational difficulties varied, the findings suggest a widespread need for additional educational support for children who have entered care, including after reunification.

1. Introduction

The educational outcomes of children in care is a topic of strong international interest. In recent years reports on educational outcomes and out-of-home care were published in Australia (AIHW, 2015), the United States (Wiegmann, Putnam Hornstein, Barrat, Magruder, & Needell, 2014), the United Kingdom (Sebba et al., 2015), and Canada (Brownell et al., 2015). All showed that children who have entered care have an 'achievement gap', performing well below the general population, and similar or worse compared to other at-risk groups. Recent research suggests that overall, being in care is not the reason for these adverse outcomes, with a range of background adversities responsible for these outcomes (Berger, Cancian, Han, Noyes, & Rios-Salas, 2015; Maclean, Taylor, & O'Donnell, 2016). Maclean et al. (2016) found that reading scores for children who were maltreated and entered out-of-home care were comparable to the general population after controlling for a range of other risk factors (including socio-economic

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disadvantage, ethnicity, and parental factors), whereas maltreated children who remained at home had increased likelihood of poor reading performance. Children's experiences of out-of-home care, however, can vary greatly according to factors such as placement stability and type of care. Understanding the aspects of children's out-of-home care experiences associated with better or worse educational outcomes may help policymakers to improve academic achievement for children who enter care (Wiegmann et al., 2014).

One of the largest studies to-date was a population linked-data study of children enrolled California's public schools, which found educational outcomes were correlated with placement stability, reunification/in-care status, type of care, and time in care (Wiegmann et al., 2014). The main limitation of the study was the use of cross-sectional data. The authors pointed out that this creates a bias towards children with longer stays in foster care and also limits the examination of the relationship between care characteristics and education outcomes to care experiences occurring during a single year. Similar limitations were described by Sebba et al. (2015) and the AIHW (2015). The current study builds upon the existing research by using longitudinal data on children's entire out-of-home care history from birth to Year 3 of school. The entire population of children who entered out-of-home care was included. Older age at entry to care has also been linked to worse outcomes (Brownell et al., 2015), so is also examined.

These aspects of care are relevant as they reflect the way out-of-home care is used, and the current policy context. For instance, in Australia, kinship care is increasingly being used, especially for Aboriginal children as part of the Aboriginal Child Placement Principle (Monohan, 2002). Within Western Australia, the cumulative incidence of entry to care has increased over the past 20 years, and there is a shift towards more children entering care aged 3 and under (O'Donnell et al., 2016). Children entering care at an early age also spent more days in care than older children (O'Donnell et al., 2016). Furthermore, identifying aspects of care related to better or worse outcomes is an important step on the pathway towards understanding the mechanisms affecting outcomes for children in care, and strengthening the knowledge base regarding optimal strategies and intervention timing to improve the academic success of children who have entered care.

2. What is known about OOHC characteristics and educational outcomes

2.1. Placement stability

One of the most common measures of placement stability is the number of different placements a child experiences. Evidence has been mixed regarding educational outcomes. An 18% increased odds of academic skills delay with each additional placement was found in one study (Zima et al., 2000), and a higher percentage of students scoring below basic performance in English language arts among students with three or more placements in the study year than those with fewer placements was found in another (Wiegmann et al., 2014). Likewise, a Swedish study found worse educational outcomes among children with long term but unstable out-of-home care histories compared to those with long term stable care, or short-intermediate term care (Vinnerljung, Öman, & Gunnarson, 2005). Conversely, there was no difference in school failure rates associated with the number of placements children in care had experienced in research by the Australian Institute of Health and Welfare (AIHW, 2015).

In a series of analyses that accounted for multiple background risk factors, Brownell et al. (2015) found the number of placements children who had entered care had experienced was only associated with two of their educational outcomes: Kindergarten school readiness, and credits earned in Grade 9. Few studies have accounted for variation in background demographic and risk factors in examining OOHC characteristics. As these risk factors are common, there is a need to further clarify the relationship between placement stability and educational outcomes after accounting for a range of demographic and social risk factors (AIHW, 2007).

Placement stability can also be examined by looking at the duration of placements. Time in current placement and time in a continuous period of care (which could include multiple placements) were each only significantly associated with educational achievement in one of four analyses (AIHW, 2015). Furthermore, some studies have suggested that educational improvements are likely to happen in the early period after placement, and then either be maintained (Barber & Delfabbro, 2005) or prove to be short-lived (Font & Maguire-Jack, 2013).

2.2. Reunification

Although a great deal of research focusses on children in care, and Australian policy supports reunification, there is relatively little research on outcomes for children who have been reunified with their families. Some research suggests reunified children may be a particularly vulnerable group. Compared to children remaining in care, reunified children were found to be more likely to have low grades, have dropped out of school, and have more behaviour problems and self-destructive behaviour in adolescence (Tausig, Clyman, & Landsverk, 2001). Other studies however have not found worse achievement outcomes for reunified children than children still in care (Brownell et al., 2015; Wiegmann et al., 2014). Further research is required to clarify the relationship between reunification and academic achievement. In addition, the effects of time since reunification on outcomes have not been specifically examined. Longer duration of time since reunification may mean greater exposure to other risks in the home such as parental mental health issues which may have a negative effect (Bellamy, 2008), or may result in increased stability with a positive effect on reading.

2.3. Type of care

Foster care and kinship care are the most commonly used forms of out-of-home care in Western Australia, with 7.3% in residential care including family group homes which are homes provided by the Department of Child Protection and Family Support or the community sector with a live-in carer (AIHW, 2015). Internationally, there has been particular interest in kinship care, which is being

increasingly used in order to maintain a connection between the child and their extended family of origin (Berrick, 1998; Farmer, 2009). However, kinship carers often have lower levels of education and income than foster carers (Gebel, 1996), and may be unprepared for caring for a relative's child when the need for placement arises suddenly. Kinship carers tend to be given less training and support than foster carers, and it has been suggested that lower quality placements may be accepted in order to maintain a family link (Peters, 2005; Spence, 2004). Consequently kinship care could be associated with better or worse reading outcomes.

A review (Winokur, Holtan, & Batchelder, 2014) found children in kinship care had more placement stability and better behaviour and mental health, but no difference for educational outcomes compared to children in non-kin foster care. All of the included studies measuring educational outcomes were from the USA. A study conducted in Spain, where kinship care is widely used, also found that children in kinship care have similar outcomes to children in foster care in teacher-rated behaviour and academic outcomes (Palacios & Jiménez, 2009). While not aiming to specifically evaluate care types, some positive educational outcomes were found for kinship care compared to other OOHC by Brownell et al. (2015). In Australia, the use of kinship care is growing, particularly for Aboriginal children in keeping with the Aboriginal Child Placement Principle (Monohan, 2002). Australian research has shown that children in kinship care are slower to be reunified (Delfabbro, Fernandez, McCormick, & Kettler, 2013), however other outcomes of kinship placement compared to foster placement have not been examined.

In contrast to kinship care, the use of residential care has declined markedly over the past four decades in Australia compared to the UK and USA, although in the last decade this has levelled off and there is renewed interest in residential care with increased psychological and educational supports for a small proportion of children in care (Ainsworth & Hansen, 2005; Smyth & Eardley, 2008). Residential care is often viewed as a placement option for children with emotional or behavioural problems who cannot easily be placed in foster or kinship care (Smyth & Eardley, 2008). Worse outcomes have been reported for students in group homes compared to the general population and children in other placement types (Wiegmann et al., 2014). An Australian study found no difference in NAPLAN achievement test scores for children by placement type, however residential care was aggregated into a broader 'other living arrangements' category for comparison with kinship and foster care (AIHW, 2007).

2.4. Time in care

Children who spend a longer total amount of time in care are children who are unable to be reunified with the families, or who experience multiple failed reunifications. Both scenarios suggest chronic difficulties in the family situation or more severe or chronic abuse. Increased time in care also increases the chance the child may experience placement changes. For all of these reasons, children with a higher total amount of time in care may be more likely to have poor educational outcomes. Wiegmann et al. (2014) found a correlation between time in care and the likelihood of passing the high school exit exam, with 54% of student who had been in care less than a year passing the exam compared to 46% of students who had been in care for three or more years. Time in care was not significant in Brownell et al. (2015).

2.5. Age at entry to care

Some research suggests worse educational outcomes for children who enter care at an older age (Brownell et al., 2015). Within Western Australia, there is a trend towards earlier entry to care (O'Donnell et al., 2016), however research is needed to assess whether educational outcomes differ for children who enter out-of-home care at a younger age.

2.6. Background risk factors

Children who have been in care tend to be disadvantaged across many areas, including socio-economic disadvantage, ethnicity, and parent and child risk factors (Maclean et al., 2016). Brownell et al. (2015) found child, parent and OOHC characteristics were all significantly associated with a range of educational outcomes for children in care, however none of the OOHC characteristics were significantly related to Grade 3 reading outcomes in the multivariate model.

2.7. The current study

The current study aims to build on existing research to provide a deeper understanding of the education gap affecting children who have entered care. Although a number of aspects of out-of-home care experiences have been linked to a range of outcomes for children, there have been mixed findings and are many gaps in regard to academic outcomes. Further investigation is required to ascertain the relationship between different types of out-of-home care histories and academic achievement in addition to taking into account other influences on academic achievement. Through the use of linked administrative data, the present study is able to examine a comprehensive set of characteristics of children's out-of-home care experiences from birth onwards. The study aims to assess the relationship between each of the following out-of-home care history characteristics up until Year 3, and Year 3 reading outcomes:

1. Placement stability (total number of placements and time in current placement)
2. Reunification status and time since exiting last placement
3. Type of care (primary type of care and most recent type)
4. Time in care

5. Age at first placement

The adjusted and unadjusted odds ratios are reported, to show the relationship of each out-of-home care history characteristic and reading scores, both at a crude level and after accounting for important characteristics of the child, family and neighbourhood that may also influence reading outcomes. This allows examination of both the overall achievement gap for children that have entered OOHC, and the contribution of many of the factors that may be associated with this gap (while recognising that not all variables that affect children's outcomes could be included, such as how much the carer helps with homework).

3. Method

3.1. Dataset

The dataset was constructed by linking data from Birth Registrations, the Midwives Notification System, Child Protection and Family Support, the Department of Education, the School Curriculum and Standards Authority and the Disability Services Commission for all children born in Western Australia (WA) between 1990 and 2010. This study focussed on children who sat the Year 3 WA Literacy and Numeracy assessment (WALNA) or National Assessment Program – Literacy and Numeracy (NAPLAN) reading tests. The data was linked by the WA Data Linkage Branch within the Department of Health using probabilistic matching, with de-identified data provided to the researchers. The data linkage process and privacy measures are described elsewhere (Kelman, Bass, & Holman, 2002).

3.2. Study population

The out-of-home care group consisted of children in the birth cohort with substantiated maltreatment who had entered out-of-home care prior to their Year 3 reading test. The comparison group was all children born in WA during the same period with no child protection contact prior to their Year 3 reading test (i.e. no maltreatment allegations). The total cohort consisted of 235,045 children, including 2160 children with a history of out-of-home care. The average age of students at their Year 3 reading test was 8 years and 4 months. Half the students were male, and 6.6% were Aboriginal. Just over half of the children with a history of out-of-home care (55.4%) had been reunified and were no longer in care on the day of the test.

3.3. Outcome variable – low reading achievement scores

From 1999 until 2007, children sat the WA Literacy and Numeracy Assessment (WALNA). WALNA was replaced by the National Assessment Program – Literacy and Numeracy (NAPLAN) in 2008, which is sat by all Australian Year 3 students in May of each year. A small percentage of children are absent on the day of the test, are withdrawn by their parents, or are exempt due to severe disabilities or having recently migrated from a non-English speaking country. The reading test was selected partly because of the relative stability of the assessments over time and comparability across the transition from WALNA to NAPLAN (Brinkman et al., 2013). Children were classed as having low reading scores if they scored in the lowest 10% of Year 3 students in WA for the year in which they sat their WALNA/NAPLAN reading test. Using decile scores helps to overcome differences in scoring methods across WALNA and NAPLAN. This cut-point was similar to the percentages of students not meeting reading benchmarks in the WA Literacy and Numeracy Assessment or National Minimum Standards in the National Assessment Program Literacy and Numeracy tests (which varies a small amount annually). Students with this level of achievement are likely to have difficulty progressing satisfactorily through school without targeted intervention and support (ACARA, 2015).

3.4. Out-of-home care placement history variables

The Department for Child Protection and Family Support (CPFS) provided placement data for all children in the birth cohort with substantiated maltreatment who had entered out-of-home care in Western Australia between 1990 and 2010. All variables reflect the situation at the time of the child's Year 3 reading test (subsequent out-of-home care experiences were not included in the analysis). Variables included: Number of placements (1, 2–3, 4+), time in current placement (1–12 months, 13–24 months, > 24 months, compared to all children not in care or placed for less than 1 month), currently in care versus reunified at the time of the test, time since reunification for children living at home (< = 12 months, > 1–2 years, > 2–4 years, > 4–6 years, > 6 years). Primary type of care represented where children had spent > 65% of their placements days in one care type (kinship, foster care, residential, or no primary type where no care type comprised > 65%). Most recent placement type at the time of the reading test (current placement or the last placement before leaving care) consisted of the major out-of-home care types: foster care, kinship care, residential care. Kinship care included care by relatives, and also other people already known to the child such as friends or neighbours. Other types of care, including care by unapproved persons, or detention were less common and of less policy interest as they are unlikely to be preferred placement options in policy or individual level placement decision-making. Therefore they were not analysed separately for care type, but contribute to number of placements and time spent in care. Total time in care consisted of the sum of days across all of a child's placements prior to the Year 3 reading test, grouped as 0- < 1 day, 1 day-12 months, > 1–5 years, > 5 years. The child's age in years at first placement was also analysed.

3.5. Covariates

3.5.1. Child characteristics

From the Midwives Notification System and Births Registrations we obtained gender, Aboriginality, year and month of birth (used to calculate age in months at the time of Year 3 tests), preterm births (< 37 weeks gestation), and birthweight. Children in the lowest 10% were classified low birthweight for gestational age, based on published reference levels (Dobbins, Sullivan, Roberts, & Simpson, 2013; Roberts & Lancaster, 1999a, 1999b). Information on children's disability status was obtained from the Intellectual Disabilities Exploring Answers (IDEA) database (Pettersen et al., 2005) and Western Australian Register of Developmental Anomalies (WARDA, Bower et al., 2015). Children were classified as having intellectual disability and/or developmental anomalies based on records in the IDEA and WARDA datasets. School attendance data from the first semester of Year 3 was available for a subgroup of children and treated as a categorical variable based on percentage of days recorded as absent out of days enrolled.

3.5.2. Parent characteristics

Maternal and paternal age were obtained from Midwives and Births data. Mental health information was obtained from the Mental Health Information System and the Hospital Morbidity Data system, which include public and private in-patient admissions and public out-patient admissions (1970–2010). International Classification of Disease codes from ICD8, ICD9 and ICD10 provide diagnostic information in both data sources. Parents were coded as having a mental health contact if their records included a mental health diagnostic code including major diagnostic categories (such as anxiety, depression, schizophrenia and bipolar disorder, but excluding substance-related diagnoses). Parents were coded as having a substance-related contact if ICD codes indicated a drug or alcohol related event. Parents' assault related admissions included any hospital admission for an assault related injury inflicted on the mother or father (ICD-9: E960-E969, ICD-10: X85-Y09). Only health contacts prior to the child's Year 3 test were included.

3.5.3. Community characteristics

Community characteristics information from the Australian Bureau of Statistics was obtained to account for disparities related to social disadvantage (ABS, 2008) and the level of remoteness (Department of Health and Aged Care, 2001). The Socio Economic Indices for Area (SEIFA) is a neighbourhood level measure of relative social disadvantage based on residence at the child's birth. The Accessibility/Remoteness Index of Australia (ARIA) indicates the accessibility of the area in which the family lives at the time of the child's birth. Data were available at the collection district level (approximately 400 households) for 90% of children. A less precise version of the variables was used to fill in the missing SEIFA and ARIA data (more recent data from postcodes, a larger geographical area).

3.6. Analysis

For each of the out-of-home care placement variables, bivariate and multivariate logistic regression analyses were conducted using SPSS version 22 software. Bivariate logistic regression results show the unadjusted odds ratio for each out-of-home care variable. A multivariate logistic regression analysis was then conducted for each OOHC variable to predict low reading scores, controlling for age, being above the typical test age range, gender, Aboriginality, intellectual disability, developmental anomalies, preterm birth, low birthweight percentile for gestational age, maternal age, maternal substance related hospital contacts, maternal assault contacts, maternal mental health contacts, paternal substance related hospital contacts, paternal assault contacts, paternal mental health contacts, social disadvantage, and remoteness. Separate logistic regression models for Aboriginal and non-Aboriginal children were also run for care type and total time in care, but not for the sub-group analyses (such as time since reunification which was limited to children living at home at the time of the test) due to smaller sample sizes. These included the same covariates listed above.

Results are presented using odds ratios (ORs) and 95% confidence intervals (CIs) (Tabachnick & Fidell, 2001). Results can be considered statistically significant (at the 0.05 level) where the confidence interval does not include 1. Analyses with large sample sizes have the potential to detect statistically significant results with very small effect sizes. Therefore the focus should not be on statistical significance alone, but also on effect sizes such as the odds ratio to determine the importance of a risk factor as these are not affected by the large sample sizes, and by showing the magnitude of the effect are more informative about the practical significance of a finding (American Psychological Association, 2009; Cumming, 2013; Ellis, 2014).

Children's age at the time of the test had a negative linear relationship with low test scores, however children with atypically high ages (most likely children who had been retained) had markedly worse reading scores. An indicator variable was added to the multivariate models in order to address these two different patterns of age effects on reading scores. Supplementary analysis was conducted for the subgroup of children with attendance data. As school attendance has been shown to be an important predictor of reading scores among maltreated children (Maclean et al., 2016) the above analyses were repeated with attendance as an additional covariate to assess whether the results changed markedly after controlling for attendance.

3.7. Ethics

Ethics approval for the study was granted by the University of WA Human Research Ethics Committee, the Department of Health Human Research Ethics Committee, and the WA Aboriginal Human Information and Ethics Committee.

4. Results

4.1. Descriptive statistics

Descriptive statistics for the cohort are shown in [Table 1](#), broken down by whether the child was in care at the time of test, had been in care but was reunified at the time of the test, or had never entered care, and also by the main type of care the child had experienced. Low reading scores were found for 30.5% of children that had been reunified and 29.1% of children in care at the time of the test, compared to 9.4% of children with no child protection contact. Among children who had ever entered out-of-home care, the percentage of children with low reading scores varied from 23.9% of children whose primary type of care was foster care to 41.6% of children whose primary type of care was residential care.

Compared to children who had no child protection involvement, children with out-of-home care experiences had markedly higher rates of adversities as well as being maltreated, such as preterm births, parent hospital contacts for assaults, mental health or substance-related issues, and low socio-economic backgrounds. Children who were in out-of-home care at the time of the Year 3 tests had similar but marginally higher levels of adversity compared to children who had been reunified and were living at home. Aboriginal children comprised 37.3% of reunified children, and 42.1% of children in care at Year 3, despite comprising only 7.0% of the study population.

Supplementary cross-tabulations (not shown) identified that kinship care was the most common primary type of care for Aboriginal children, and was used for a higher percentage of Aboriginal children with a care history (36.5%) than non-Aboriginal children (17.9%). Foster care was the most common primary type of care for non-Aboriginal children (44.5%), and less common for Aboriginal children (21.2%). Residential care was less frequently used, but was the primary care type for a higher percentage of Aboriginal children (14.1%) than non-Aboriginal children (4.5%). Children in residential care were more likely to have been born in remote/very remote areas (41.3%), compared to children in kinship care (17.4%) or foster care (7.7%). Approximately half of the children whose primary care type was residential or kinship care and a quarter of children in foster care had a mother with a previous hospital contact as an assault victim. Most children with a primary care type of residential care (70.9%) had spent a total of one year or less in care across all placements, whereas other care placements were associated with a longer time in care. Children primarily in residential care were least likely to have had 4+ placements (22.3%) compared to kinship care (37.1%), and foster care (35.4%). Two thirds of children with no primary placement/mixed care had 4+ placements (67.2%).

4.2. Logistic regression analysis

4.2.1. Number of placement changes

The associations between number of placements and low reading scores did not fit a dose-response pattern (see [Table 2](#)). Overall, 2–3 placements were associated with significantly worse reading scores than no placements, however 1 placement and 4+ placements were not associated with worse reading scores in the multivariate model. For non-Aboriginal students, 2–3, or 4+ placements were associated with significantly worse reading scores than no placements, whereas one placement did not differ significantly from no placements for reading scores.

4.2.2. Time in current placement

A short duration in the most recent placement (up to 12 months) was associated with worse reading scores compared to no placements (OR 1.44, 95% CI [1.12, 1.85]), as shown in [Table 3](#). Reading scores for children with more than 12 months in the current placement did not differ significantly from those of children not in care.

4.2.3. Reunification and time since reunification

Children who had been reunified before the Year 3 reading test performed significantly worse than the general population (OR = 1.35, 95% CIs [1.16, 1.57]), whereas children still in care did not differ from the general population ([Table 4](#)). The difference between reading scores for reunified children and those still in care was not significant (see [Appendix A](#)).

For children who had been reunified, being reunified within 12 months prior to the Year 3 tests was associated with worse reading scores compared to those who had been reunified for more than 12 months. As the duration of time since reunification increased, however, the ‘protective’ effect of being past the first 12 months decreased. Number of periods of care (where higher numbers indicate a greater number of care entries and reunifications) was not significant in either the bivariate or multivariate analysis, including when broken down by Aboriginality.

4.2.4. Primary type of care

Primary type of care was defined as more than 65% of out-of-home care days spent in kinship, foster or residential care, or ‘mixed care’ when there was no primary type. Overall, before adjusting for other risk factors, all placement types were associated with significantly lower reading scores, with odds ratios varying from OR 3.00, 95% CI[2.52, 3.58] for foster care to OR 6.81, 95% CI [4.94, 9.39] for residential care. The increased odds associated with placement type was largely attenuated in the multivariate model. For non-Aboriginal children the multivariate analysis showed only ‘mixed’ placement (no primary type) was associated with worse reading scores than the general population ([Table 5](#)). For Aboriginal children residential care had the highest odds of low reading scores but none of the care types were significantly associated with reading scores in the multivariate model.

Table 1
 Characteristics of study population by placement status and by primary type of care.

		Placement Status at Yr3 test						Primary Type of Out-Of-Home Care							
		Never Placed		Reunified By Test		In care		Kinship		Foster		Residential		Mixed	
Low reading score	Not Low	204,768	90.6%	741	69.5%	631	70.9%	340	68.0%	529	76.1%	90	58.4%	232	66.1%
	Lowest 10%	21,327	9.4%	325	30.5%	259	29.1%	160	32.0%	166	23.9%	64	41.6%	119	33.9%
Gender	Female	113,529	48.7%	574	48.0%	475	49.3%	269	49.4%	363	47.6%	89	49.7%	189	48.1%
	Male	119,356	51.3%	623	52.0%	488	50.7%	276	50.6%	399	52.4%	90	50.3%	204	51.9%
Higher than typical age	No	219,089	94.1%	1098	91.7%	849	88.2%	492	90.3%	682	89.5%	158	88.3%	357	90.8%
	Yes	13,796	5.9%	99	8.3%	114	11.8%	53	9.7%	80	10.5%	21	11.7%	36	9.2%
Birth anomaly	No	219,480	94.2%	1118	93.4%	875	90.9%	504	92.5%	685	89.9%	167	93.3%	372	94.7%
	Yes	13,405	5.8%	79	6.6%	88	9.1%	41	7.5%	77	10.1%	12	6.7%	21	5.3%
Intellectual disability	No	230,272	98.9%	1114	93.1%	880	91.4%	506	92.8%	680	89.2%	169	94.4%	370	94.1%
	Yes	2613	1.1%	83	6.9%	83	8.6%	39	7.2%	82	10.8%	10	5.6%	23	5.9%
Aboriginal	Non-Aboriginal	218,301	93.7%	751	62.7%	558	57.9%	234	42.9%	582	76.4%	59	33.0%	222	56.5%
	Aboriginal	14,584	6.3%	446	37.3%	405	42.1%	311	57.1%	180	23.6%	120	67.0%	171	43.5%
Preterm birth	Not preterm	217,638	93.5%	1010	84.4%	813	84.6%	450	82.9%	645	84.6%	155	86.6%	332	84.7%
	Preterm	15,016	6.5%	186	15.6%	148	15.4%	93	17.1%	117	15.4%	24	13.4%	60	15.3%
Birthweight percentile for gestational age	Low < 10th	23,061	9.9%	245	20.5%	220	22.9%	131	24.2%	170	22.3%	31	17.3%	78	19.9%
	Not Low	209,066	90.1%	949	79.5%	741	77.1%	411	75.8%	592	77.7%	148	82.7%	314	80.1%
Marital status	Married/defaulto	211,077	90.6%	674	56.3%	562	58.4%	292	53.6%	442	58.0%	100	55.9%	224	57.0%
	Not married/unknown	21,808	9.4%	523	43.7%	401	41.6%	253	46.4%	320	42.0%	79	44.1%	169	43.0%
Maternal age category	< 20	12,388	5.3%	258	21.6%	190	19.7%	124	22.8%	146	19.2%	32	17.9%	91	23.2%
	20–29	118,530	50.9%	684	57.1%	564	58.6%	342	62.8%	427	56.0%	105	58.7%	214	54.5%
	30+	101,967	43.8%	255	21.3%	209	21.7%	79	14.5%	189	24.8%	42	23.5%	88	22.4%
Maternal mental health contact	No	202,477	86.9%	512	42.8%	359	37.3%	218	40.0%	288	37.8%	85	47.5%	152	38.7%
	Yes	30,408	13.1%	685	57.2%	604	62.7%	327	60.0%	474	62.2%	94	52.5%	241	61.3%
Maternal substance Contact	No	220,025	94.5%	515	43.0%	341	35.4%	176	32.3%	340	44.6%	64	35.8%	142	36.1%
	Yes	12,860	5.5%	682	57.0%	622	64.6%	369	67.7%	422	55.4%	115	64.2%	251	63.9%
Maternal assault	No	228,500	98.1%	790	66.0%	578	60.0%	272	49.9%	552	72.4%	85	47.5%	237	60.3%
	Yes	4385	1.9%	407	34.0%	385	40.0%	273	50.1%	210	27.6%	94	52.5%	156	39.7%
Paternal mental health contact	No	217,366	93.3%	979	81.8%	754	78.3%	426	78.2%	615	80.7%	156	87.2%	313	79.6%
	Yes	15,519	6.7%	218	18.2%	209	21.7%	119	21.8%	147	19.3%	23	12.8%	80	20.4%
Paternal substance contact	No	217,868	93.6%	891	74.4%	667	69.3%	372	68.3%	579	76.0%	133	74.3%	265	67.4%
	Yes	15,017	6.4%	306	25.6%	296	30.7%	173	31.7%	183	24.0%	46	25.7%	128	32.6%
Paternal assault	No	224,480	96.4%	978	81.7%	751	78.0%	415	76.1%	631	82.8%	135	75.4%	305	77.6%
	Yes	8405	3.6%	219	18.3%	212	22.0%	130	23.9%	131	17.2%	44	24.6%	88	22.4%
Neighbourhood social disadvantage (SEIFA)	5 – Most disadvantaged	47,184	20.4%	576	48.2%	484	50.8%	276	51.1%	361	47.5%	101	56.4%	208	53.5%
	4	49,192	21.2%	291	24.4%	240	25.2%	140	25.9%	184	24.2%	42	23.5%	86	22.1%
	3	46,980	20.3%	190	15.9%	133	14.0%	67	12.4%	119	15.7%	21	11.7%	62	15.9%
	2	43,873	18.9%	90	7.5%	54	5.7%	40	7.4%	55	7.2%	10	5.6%	22	5.7%
	1 – Least disadvantaged	44,470	19.2%	47	3.9%	42	4.4%	17	3.1%	41	5.4%	5	2.8%	11	2.8%
Remoteness (ARIA)	1 – Least remote	157,463	67.8%	743	62.1%	674	70.3%	345	63.8%	530	69.6%	81	45.3%	257	65.6%
	2	25,146	10.8%	132	11.0%	95	9.9%	42	7.8%	101	13.3%	3	1.7%	51	13.0%
	3	27,869	12.0%	121	10.1%	88	9.2%	60	11.1%	72	9.4%	21	11.7%	36	9.2%
	4	15,404	6.6%	111	9.3%	74	7.7%	65	12.0%	45	5.9%	23	12.8%	32	8.2%
	5 – Most remote	6406	2.8%	89	7.4%	28	2.9%	29	5.4%	14	1.8%	51	28.5%	16	4.1%
Time in current placement	0– < 1 month	232,885	100.0%	0	0.0%	19	2.0%	0	0.0%	7	2.0%	6	11.5%	6	3.8%
	1–12 months	0	0.0%	0	0.0%	383	39.8%	130	38.8%	110	31.3%	14	26.9%	87	54.7%
	13–24 months	0	0.0%	0	0.0%	156	16.2%	59	17.6%	44	12.5%	6	11.5%	37	23.3%
	> 24 months	0	0.0%	0	0.0%	404	42.0%	146	43.6%	191	54.3%	26	50.0%	29	18.2%
Total time in care	1 day–12 months	0	0.0%	603	50.9%	156	16.2%	106	19.4%	308	40.4%	127	70.9%	80	21.0%
	> 1–5 years	0	0.0%	454	38.3%	447	46.5%	293	53.8%	220	28.9%	32	17.9%	225	59.1%
	> 5 years	0	0.0%	128	10.8%	359	37.3%	146	26.8%	234	30.7%	20	11.2%	76	19.9%
Number of placements	None	232,885	100.0%	0	0.0%	0.0%	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	1	0	0.0%	355	29.7%	149	15.5%	128	23.5%	215	28.2%	76	42.5%	11	2.8%
	2–3	0	0.0%	455	38.0%	362	37.6%	215	39.4%	277	36.4%	63	35.2%	118	30.0%
	4+	0	0.0%	387	32.3%	451	46.8%	202	37.1%	270	35.4%	40	22.3%	264	67.2%

Note: Totals for some variables do not sum to the population totals due to missing data.

Table 2

Logistic regressions: Odds of low reading scores by number of placements for all children and by Aboriginality.

	Bivariate OR (95% CI)		Multivariate OR (95% CI)	
Child age in months	0.99*	(0.98, 0.99)	0.97*	(0.96, 0.97)
Higher than typical age	1.12	(1.06, 1.19)	1.26*	(1.17, 1.35)
Gender, male	1.49*	(1.45, 1.53)	1.53*	(1.48, 1.57)
Aboriginal	5.81*	(5.59, 6.03)	2.88*	(2.75, 3.02)
Intellectual disability	9.61*	(8.80, 10.5)	7.98*	(7.26, 8.78)
Birth anomaly	1.11	(1.05, 1.18)	1.08*	(1.02, 1.15)
Preterm birth (< 37 weeks)	1.38*	(1.32, 1.46)	1.17*	(1.11, 1.24)
Birthweight percentile for gestational age < 10th%	1.48*	(1.42, 1.55)	1.22*	(1.16, 1.27)
Not married/unknown	2.26*	(2.17, 2.34)	1.27*	(1.21, 1.32)
Maternal age 30+	reference		reference	
Maternal age < 20	3.49*	(3.32, 3.68)	1.57*	(1.48, 1.67)
Maternal age 20–29	1.62*	(1.57, 1.67)	1.25*	(1.21, 1.29)
Maternal substance-related contact	2.49*	(2.38, 2.61)	1.30*	(1.23, 1.38)
Maternal assault	5.41*	(5.08, 5.76)	1.42*	(1.31, 1.54)
Maternal mental health contact	1.56*	(1.51, 1.62)	1.16*	(1.12, 1.21)
Paternal substance-related contact	1.90*	(1.82, 1.99)	1.17*	(1.11, 1.24)
Paternal assault	2.32*	(2.19, 2.46)	1.17*	(1.10, 1.25)
Paternal mental health contact	1.47*	(1.40, 1.54)	1.17*	(1.10, 1.23)
SEIFA 1-least disadvantaged	reference		reference	
2	1.64*	(1.54, 1.74)	1.39*	(1.31, 1.47)
3	2.16*	(2.04, 2.29)	1.73*	(1.63, 1.83)
4	2.64*	(2.50, 2.79)	1.89*	(1.78, 2.00)
5 – most disadvantaged	4.39*	(4.17, 4.63)	2.42*	(2.29, 2.56)
ARIA remoteness – 1 least remote	reference		reference	
2	1.37*	(1.31, 1.44)	1.18*	(1.13, 1.24)
3	1.54*	(1.48, 1.61)	1.24*	(1.19, 1.30)
4	1.97*	(1.88, 2.07)	1.40*	(1.32, 1.47)
5- most remote	4.43*	(4.18, 4.71)	2.13*	(1.99, 2.29)
No placements	reference		reference	
1 placement	3.94*	(3.22, 4.83)	1.12	(0.89, 1.41)
2–3 placements	4.18*	(3.57, 4.89)	1.41*	(1.18, 1.68)
4+ placements	4.09*	(3.50, 4.77)	1.14	(0.95, 1.35)

Number of Placements	Bivariate OR (95% CI)		Multivariate OR (95% CI)	
Non-Aboriginal				
No placements	reference		reference	
1 placement	2.65*	(1.95, 3.61)	1.18	(0.85, 1.63)
2–3 placements	3.85*	(3.14, 4.72)	1.71*	(1.38, 2.14)
4+ placements	3.98*	(3.22, 4.92)	1.61*	(1.28, 2.02)
Aboriginal				
No placements	reference		reference	
1 placement	1.60*	(1.19, 2.15)	1.17	(0.86, 1.61)
2–3 placements	1.40*	(1.08, 1.81)	1.13	(0.86, 1.49)
4+ placements	1.12*	(0.89, 1.42)	0.91	(0.71, 1.18)

* p < 0.05.

4.2.5. Most recent type of care

We defined most recent care type as the type of placement at the time of the Year 3 reading test for children in care, or the last placement before the test for children who had been reunified. The three major care types (kinship, foster or residential) were

Table 3

Logistic regression: Odds of low reading scores by months in current placement for children in care at Year 3 test and comparison group.

Months in current placement	Bivariate OR (95% CI)		Multivariate OR (95% CI)	
Not in care or < 1	reference		reference	
1-12 months	5.18*	(4.16, 6.46)	1.44*	(1.12, 1.85)
13-24 months	3.71*	(2.59, 5.32)	1.10	(0.73, 1.65)
> 24 months	2.89*	(2.27, 3.67)	0.77	(0.59, 1.00)

Notes: Multivariate analysis adjusted for child age, atypically high age, gender, Aboriginality, intellectual disability, birth anomaly, preterm birth, low birthweight for gestational age, maternal age, mother's marital status at birth, maternal substance contacts, maternal assault contacts, maternal mental health contacts, paternal substance contacts, paternal assault contacts, paternal mental health contacts, SEIFA, ARIA.

* p < 0.05.

Table 4

Logistic regressions: Odds of low reading scores by reunification status and time since reunification.

Reunification status	Bivariate OR (95% CI)		Multivariate OR (95% CI)	
Never in care	Reference level		Reference level	
Reunified – home at time of test	4.21 [*]	(3.69, 4.80)	1.35 [†]	(1.16, 1.56)
In care at time of test	3.94 [*]	(3.41, 4.56)	1.09	(0.93, 1.29)
If Reunified: Time Since Exiting Last Placement	Bivariate OR (95% CI)		Multivariate OR (95% CI)	
0-12 months	Reference level		Reference level	
> 1–2 years	0.50 [*]	(0.31, 0.80)	0.51 [*]	(0.31, 0.83)
> 2–4 years	0.56 [*]	(0.38, 0.81)	0.60 [†]	(0.40, 0.89)
> 4–6 years	0.63 [†]	(0.44, 0.92)	0.65 [†]	(0.43, 0.97)
> 6 years	0.94	(0.63, 1.40)	0.89	(0.58, 1.36)

Notes: Multivariate analyses adjusted for child age, atypically high age, gender, Aboriginality, intellectual disability, birth anomaly, preterm birth, low birthweight for gestational age, maternal age, mother's marital status at birth, maternal substance contacts, maternal assault contacts, maternal mental health contacts, paternal substance contacts, paternal assault contacts, paternal mental health contacts, SEIFA, ARIA.

* p < 0.05.

compared to all other children in the population (Table 6). For most recent care type, residential care was associated with significantly worse reading outcomes for non-Aboriginal children and overall. Residential care was also associated with the highest odds of low reading scores for Aboriginal children but was non-significant. Kinship care was associated with significantly worse reading outcomes for non-Aboriginal children, whereas for Aboriginal children whose most recent placement was kinship care outcomes were similar to the general population of Aboriginal children.

4.2.6. Time in care

Despite the fact that total time in care may be spread over more than one placement so does not necessarily indicate stability, the results for longer duration in care overall were similar to the results for amount of time in the most recent placement. Shorter amounts of time (up to 1 year, and 1–5 years) were associated with significantly worse reading outcomes compared to no time in care (OR 1.35, 95% CI [1.12,1.62] and OR 1.34, 95% CI [1.14,1.59] respectively). For children who had been in care for over 5 years in total, reading outcomes did not differ from the general population (OR 0.87, 95% CI [0.69,1.11]).

4.2.7. Age at first entry to care

In the multivariate model, children who first entered care aged 4 and older had significantly worse reading outcomes compared to children who entered care aged 0–3 years (OR 1.24, 95% CI [1.01,1.54]).

Table 5

Logistic regressions: Odds of low reading scores by primary type of care, overall and by Aboriginality.

Primary type of care	Bivariate OR (95% CI)		Multivariate OR (95% CI)	
All Children				
All other children	reference		reference	
Kinship	4.51 [†]	(3.73, 5.44)	1.01	(0.82, 1.24)
Foster	3.00 [†]	(2.52, 3.58)	1.06	(0.87, 1.29)
Residential	6.81 [†]	(4.94, 9.39)	1.39	(0.98, 1.99)
Mixed/No primary type	4.91 [†]	(3.94, 6.13)	1.44 [*]	(1.13, 1.84)
Non-Aboriginal				
All other children	reference		reference	
Kinship	3.78 [†]	(2.78, 5.12)	1.47 [†]	(1.06, 2.03)
Foster	3.01 [†]	(2.44, 3.71)	1.20	(0.96, 1.51)
Residential	3.22 [†]	(1.70, 6.11)	1.47	(0.75, 2.90)
Mixed/No primary type	5.52 [†]	(4.11, 7.40)	2.35 [*]	(1.71, 3.22)
Aboriginal				
All other children	reference		reference	
Kinship	1.21	(0.95, 1.55)	0.95	(0.73, 1.24)
Foster	1.06	(0.76, 1.48)	0.90	(0.63, 1.28)
Residential	2.20 [†]	(1.48, 3.27)	1.35	(0.88, 2.07)
Mixed/No primary type	1.12	(0.80, 1.57)	0.95	(0.66, 1.36)

Notes: Multivariate analyses adjusted for child age, atypically high age, gender, Aboriginality, intellectual disability, birth anomaly, preterm birth, low birthweight for gestational age, maternal age, mother's marital status at birth, maternal substance contacts, maternal assault contacts, maternal mental health contacts, paternal substance contacts, paternal assault contacts, paternal mental health contacts, SEIFA, ARIA.

* p < 0.05.

Table 6

Logistic regressions: Odds of low reading scores by recent type of care, overall and by Aboriginality.

Most recent type of care	Bivariate OR (95% CI)		Multivariate OR (95% CI)	
All Children	Reference level		Reference level	
All other children	Reference level		Reference level	
Kinship	4.73 [†]	(3.95, 5.68)	1.03	(0.84, 1.26)
Foster	3.18 [†]	(2.68, 3.78)	1.13	(0.93, 1.37)
Residential	6.92 [†]	(5.18, 9.25)	1.50 [†]	(1.08, 2.08)
Non-Aboriginal	Reference level		Reference level	
All other children	Reference level		Reference level	
Kinship	4.10 [†]	(3.06, 5.50)	1.52 [†]	(1.11, 2.08)
Foster	3.04 [†]	(2.46, 3.76)	1.25	(0.99, 1.57)
Residential	4.60 [†]	(2.81, 7.55)	1.99 [†]	(1.17, 3.38)
Aboriginal	Reference level		Reference level	
All other children	Reference level		Reference level	
Kinship	1.25	(0.98, 1.58)	0.99	(0.77, 1.28)
Foster	1.18	(0.86, 1.60)	1.03	(0.74, 1.43)
Residential	2.10 [*]	(1.45, 3.06)	1.31	(0.87, 1.96)

Notes: Multivariate analyses adjusted for child age, atypically high age, gender, Aboriginality, intellectual disability, birth anomaly, preterm birth, low birthweight for gestational age, maternal age, mother's marital status at birth, maternal substance contacts, maternal assault contacts, maternal mental health contacts, paternal substance contacts, paternal assault contacts, paternal mental health contacts, SEIFA, ARIA.

^{*} p < 0.05.

4.2.8. The role of attendance

Sensitivity analysis was conducted to ensure that the differences observed in reading scores weren't purely a result of difference in school attendance. Attendance data was only available for a subgroup of the cohort, comprised of the children who attended Government schools and sat Year 3 reading tests between 2008 and 2010. This group included a total of 44,773 students, including 751 with out-of-home care experiences. The results were broadly consistent with the findings presented above. Although some effects were attenuated, caution must be taken in interpreting the results because of small sample sizes, particularly in the more detailed analyses. Attendance was a significant predictor of reading scores, and relationships between out-of-home care experiences and attendance warrants more nuanced examination with a larger dataset, which is beyond the scope of this paper. The sensitivity analysis conducted showed that the main findings are robust when controlled for attendance, and that other pathways contribute to the effect of placement experiences on reading scores. It did not rule out attendance as an independent contributor or partial mediator of reading scores.

5. Discussion

This is the first Australian study to examine the relationship between a comprehensive set of out-of-home care history characteristics and children's educational outcomes at a population level. The inclusion of longitudinal data on all placement experiences from birth, along with child, family and neighbourhood covariates is a strength of the study. Our results showed that early educational outcomes vary across children with different placement histories. The results are not intended to reflect causal effects of specific placement decisions (although this may sometimes be the case), but rather to identify the placement history characteristics associated with worse reading outcomes, to inform targeting of educational support services. The major findings can be grouped into three topics: where the child has been placed, the relationship between placement changes or stability and time, and the possibility of cumulative effects of instability via multiple placement changes.

5.1. Where the child has been placed: placement type and reunification

Placement type was significantly associated with differences in reading scores. Based on the unadjusted analysis, children in all primary placement types were at significantly increased odds of poor reading compared to children without child protection contact, however the odds ratios varied from almost seven for residential care, down to four to five for mixed care and kinship care, and a threefold increased odds for foster care. Examination of the results by Aboriginality showed that for Aboriginal children, residential care was associated with significantly worse reading in the bivariate analysis, but was not significant after controlling for other risk factors. For non-Aboriginal children, mixed care type was associated with a doubled odds of poor reading even after adjusting for other risk factors, while kinship care was associated with a smaller but significant increased odds of low reading scores. Results for most recent placement type were similar, but also indicated significantly worse odds for non-Aboriginal children who had been in residential care.

Although previous studies have not always found a significant difference in academic outcomes by placement type (AIHW, 2007; Conger & Rebeck, 2001), our finding of worse educational outcomes among children who had been placed in residential care are consistent with studies including Flynn, Tessier, and Coulombe (2013) and Wiegmann et al. (2014) as well as research showing a variety of other adverse outcomes among children in residential care, including subsequent placement breakdowns, worse school

attendance (Conger & Rebeck, 2001), behaviour problems (Lee, 2009) and arrests (Baskin & Sommers, 2011). It has been suggested that the poor outcomes common among children in residential care may not reflect the impact of residential care, but rather the frequency of severe emotional and behavioural problems among children for whom residential care is more likely to be a viable placement option (Bath, 2008). In keeping with that explanation, after controlling for risk factors including behavioural and emotional problems Flynn et al. (2013) found the effect of placement type was attenuated. Nevertheless, with children placed in residential care showing an almost seven-fold crude increased odds of poor educational outcomes, this is a group for whom educational supports must be a priority (along with addressing psychological needs).

Kinship care was associated with increased odds of low reading scores among non-Aboriginal children, but not among Aboriginal children. Kinship carers have been found to receive less support than foster carers, and given the higher levels of low-education, poverty and stress (Ehrle & Geen, 2002; Gebel, 1996; Spence, 2004), may actually have greater needs for support. One study found kinship carers who had lower education levels themselves felt intimidated by the education system and therefore reluctant to engage with it. The same study found an improvement in kinship carers' self-efficacy in supporting the educational needs of children in their care following a school-based intervention (Strozier, McGrew, Krisman, & Smith, 2005).

Results for children who had been reunified are at least as concerning as those of children who are in care. This is consistent with several studies showing reunified children to be a group with increased risk for a range of adverse outcomes (Bellamy, 2008; Taussig et al., 2001; Wade, Biehal, Farrelly, & Sinclair, 2010). A previous study suggested adverse outcomes are primarily attributable to increased exposure to parent and family risk factors such as parental mental health problems (Bellamy, 2008), although recurrent maltreatment is another possibility. In Western Australia, education officers within Child Protection and Family Support are available to assist with children's education needs while they are in out-of-home care. This support ceases upon reunification.

5.2. Placement and time: age at entry to care and time in current living arrangements

The second set of findings relate to the impact of placement in relation to time. One aspect of time is the point in the child's life at which they first enter care. We found worse outcomes for children who first entered care aged four and over, compared to younger entrants. This is consistent with research showing a range of adverse outcomes are more common for children entering care at an older age (Brownell et al., 2015; DeGue & Widom, 2009; Lee, 2009). As all children were around eight years old when they sat the Year 3 tests, we cannot ascertain whether the better outcomes for younger entrants reflect greater adaptability to out-of-home care among very young children, an increase in the time between first entry and the time of the test, or earlier child protection intervention.

Time in a particular living arrangement can also shape outcomes. For both placement changes and reunifications we saw worse reading outcomes if the test was within one year after the change in living arrangements, which may reflect the disruptive effect of such changes. Our results differed from a previous study which found more positive educational outcomes at Wave 2 for children who entered care after Wave 1 of the survey (Font & Maguire-Jack, 2013), but are consistent with research showing that times of transition can be disruptive for children (Newman & Blackburn, 2002). In both cases (placement changes and reunifications), the initial 'disrupted' year was followed by a linear pattern, although in opposite directions. Reunified children had the lowest odds of low reading scores one to two years after reunification, with the likelihood of low reading scores then increasing over time. Conversely, children who were in-out-of-home care had a trend towards better outcomes as the time in the current placement increased. A similar pattern was found for total time in care. The results suggest that periods of instability negatively affect reading outcomes, whereas stability may help or hinder outcomes, most likely depending on the quality of the home environment. Reunified children may be exposed to a much greater array of adversities, in addition to the risk of maltreatment recurrence. A better understanding of the factors influencing reunified children's educational outcomes over time would be valuable. Where assessments are likely to impact on children's future opportunities (such as competitive entry to selective schools or tertiary education), it is important that allowances are made for the short-term disruptive effect of changes in living arrangements, or sufficient stability or support is provided to prevent children's assessment results being adversely affected.

5.3. Potential cumulative educational risk from multiple placements

Given the apparently disruptive effect of placement changes, one might expect that multiple placements would result in higher cumulative likelihood of low reading scores. High numbers of placements have been linked to a range of adverse outcomes for children in care including poor educational outcomes (Zima et al., 2000; Vinnerljung et al., 2005; Wiegmann et al., 2014) and also problem behaviours (Lee, 2009). Contrary to our expectations, we did not find a consistent linear effect of number of placements, although for non-Aboriginal children, a single placement was associated with better outcomes than more than one placement. Ours is not the first study not to find a clear association between placement stability and educational outcomes: Runyan and Gould (1985) and more recently AIHW (2015) found no significant effect of number of placements. It should also be noted that care history variables are often interlinked, for instance for almost half of Aboriginal children with a single placement the most recent placement was in residential care, and placement length was likely to be shorter. Over half (58%) of Aboriginal children with four or more placements were most recently in kinship care. Any impact of placement moves in our study population may have been outweighed by other factors related to positive educational outcomes. Although further research is needed, our results suggest that a placement move can be associated with positive outcomes where the placement is of overall benefit to the child. An Australian study found that although stability and number of placements were significantly associated with educational attainment, feeling loved and secure was even more important (Cashmore, Paxman, & Townsend, 2007).

5.4. Limitations

The study had a number of limitations. Overall, there are marked differences in both the backgrounds of the children entering different types of out-of-home care, and in the patterns of use (such as number of placements, time in care and likelihood of reunification across different care types). Given the limited sample size and distributions of variables, it was not feasible to include all variable combinations in one analysis and disentangle the many potential complex interactions between the variables. Furthermore, this study could not capture some important characteristics of the children (such as behavioural and mental health problems) and of the foster care environment (such as the education and poverty status of the caregiver), which have also been found to differ across care types. Therefore in interpreting the results, each variable can be used as a marker of educational risk, but should not be considered as causal, nor independent from other characteristics of the child and their placement histories as in reality these are deeply interwoven.

In addition, although the quality of the linked data is high, there are limitations in using solely administrative data, including the inability to capture the perspectives of children and carers, and a lack of detailed information on the specific care environments the children experienced such as access to computers, carer attitudes to education and help with homework. The inclusion of survey data or qualitative data with the administrative data would provide a more nuanced analysis. Similarly, while standardised national tests are considered the gold standard in educational assessment due to their objective nature, they are only one measure of how children in OOHC are faring, and further analysis of this group of children looking at a range of outcomes would be informative.

5.5. Conclusions and next steps

Despite these limitations, the study highlights out-of-home care history characteristics that are associated with better and worse educational outcomes for children. It is the first Australian study to examine such a broad range of out-of-home characteristics in relation to educational outcomes, and includes information such as the relationship between time since reunification and educational outcomes which has not been previously examined.

This information can be used in targeting support services for children who have been in care. Children in residential care have a much higher odds of low reading scores, although the increase in odds is attenuated by background adversities in a number of the multivariate analyses. Regardless of the causes, these children have a strong need for additional services that improve their educational outcomes, whether by directly targeting educational difficulties, or where appropriate ensuring mental health and behavioural issues that can impact on schooling are addressed. Kinship carers may benefit from additional support in helping the children in their care with schooling. School based interventions to increase caregivers confidence liaising with the school have shown some promise, however direct interventions with the children may also be needed. Reunified children had increasing odds of low reading scores as the time since reunification increased from one to five years. Many supports are restricted to children currently in care, so reunified children are likely to be an under-served group. Children aged four and above at placement had increased educational risk. Transitions appear to also be disruptive for children, although the effects reduced over time and did not accumulate. Although it is concerning that such educational disparities are present at such a young age even within a group of children with maltreatment and out-of-home care backgrounds, knowledge of factors associated with worse outcomes can assist in targeting support to the children with greatest need, and at the appropriate times. It is important to recognise, however, that despite variations, there is a high level of educational risk for all groups of children who have been in care, and a need for increased support to improve reading achievement.

Several areas for further research are highlighted by this study. First, it would be valuable to understand the causal mechanisms behind the associations between various out-of-home care experiences and adverse educational outcomes. Qualitative studies in the less studied areas (such as time since reunification) would be valuable, followed by research that quantifies the findings. Second, our study focussed on relatively young children (up to approximately age eight). It is possible that some out-of-home care experiences may have a greater or different effect on older children's educational outcomes, as children accumulate a longer placement history, face more challenging school work, and reach adolescence. Research examining the relationship between children's care experiences and their educational trajectories into high school is required. Finally, further research assessing the effectiveness of educational interventions for children in out-of-home care is required. Although there is research evidence for a number of types of interventions, to-date they have not been compared (Forsman & Vinnerljung, 2012; Liabo, Gray, & Mulcahy, 2013), and there is scope for more targeting of the different potential causes of educational difficulties overall and by child or care history characteristics. This study highlights the variations in educational outcomes across children with different care history characteristics, and groups most in need of intervention to prevent long-term educational difficulties.

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Appendix A

See Table A1.

Table A1

Logistic regressions: Odds of low reading scores for reunified children versus those in care.

Reunification status	Bivariate OR (95% CI)	Multivariate OR (95% CI)
In care at time of test	Reference level	Reference level
Reunified – home at time of test	1.07 (0.88, 1.30)	1.09 (0.89, 1.35)

Notes: Multivariate analyses adjusted for child age, atypically high age, gender, Aboriginality, intellectual disability, birth anomaly, preterm birth, low birthweight for gestational age, maternal age, mother's marital status at birth, maternal substance contacts, maternal assault contacts, maternal mental health contacts, paternal substance contacts, paternal assault contacts, paternal mental health contacts, SEIFA, ARIA.

* p < 0.05.

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