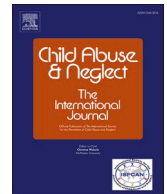




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Child Abuse & Neglect

journal homepage: www.elsevier.com/locate/chiabuneg

Positive reading achievement outcomes in children who experience out-of-home care: Characteristics and predictors

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ARTICLE INFO

Keywords:

Academic outcomes
Educational achievement
Out-of-home care
Maltreated children

ABSTRACT

Background: Children who enter out-of-home care ('care') are at increased risk for low academic achievement. Nonetheless, some children who have experienced out-of-home care achieve highly. Several qualitative studies of academically successful young adults with care histories have highlighted factors that may contribute to positive outcomes; however longitudinal cohort research is needed to identify characteristics and predictors of higher achieving younger children who experienced care.

Objective: To describe characteristics and circumstances of children with higher reading achievement who had entered care, and predictors of higher achievement.

Participants and setting: The study included 778 children from the Pathways of Care Longitudinal Study (POCLS) in New South Wales, Australia.

Methods: Prospective cohort data from interviews and linked administrative child protection and education data were used to identify factors associated with higher Year 3 reading achievement among Aboriginal and non-Aboriginal children that may assist in improving outcomes.

Results: Although a lower proportion than the general population, almost half (46 %) of children who entered care were in the higher achievement group. Higher achieving students were a diverse group and faced many adversities commonly found among children who experienced care generally. Multivariable logistic regression showed higher achievement in the cohort was significantly associated with: average or above cognitive ability, low externalizing behaviour, highly-educated carers, and non-Aboriginal students. Several supports and services were associated with higher achievement, but inconsistently across analyses.

Conclusions: Results indicate potential interventions could target cognitive ability, wellbeing and environmental factors, and involve interventions directly with children and via carers to improve student outcomes.

1. Positive reading achievement outcomes in children in out-of-home care: characteristics and predictors

Internationally, it is well established that children who experience out-of-home care (care) are at risk for adverse developmental outcomes across a range of domains including education (Gypen, Vanderfaeillie, De Maeyer, Belenger, & Van Hoken, 2017). In Australia, out-of-home care is primarily used to address immediate child safety concerns regarding maltreatment, and children in care disproportionately include Aboriginal and socially disadvantaged children with many risk factors for low achievement (Maclean,

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<https://doi.org/10.1016/j.chiabu.2023.106282>

Received 28 July 2022; Received in revised form 21 May 2023; Accepted 7 June 2023

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Taylor, & O'Donnell, 2016). Nonetheless, some children who have been in care are successful academically, and it is worth examining this group to identify factors which may enable better outcomes.

A review by O'Higgins, Sebba, and Gardner (2017) found over 70 variables have been examined in relation to education outcomes for children who have been in care, although not all were significant. These variables, some fixed and some malleable, were grouped according to ecological levels (child, biological family, care and school factors). The most consistent predictors of lower achievement were child factors, specifically gender (male), ethnic minority status, and special educational needs, and there was some evidence for a range of other factors (O'Higgins et al., 2017). Developmental domains that would be expected to affect educational outcomes for children placed in care include cognitive and socio-emotional development, however the review found inconsistent evidence, so further research is required. Likewise a higher number of child protection reports has been linked to low achievement, but not consistently across subjects and grades (Townsend et al., 2020).

Understanding out-of-home care factors and related services and supports associated with educational achievement is particularly relevant for child protection departments as these supports may be malleable and within their jurisdiction. Although results were mixed, associations have been found between educational achievement and placement variables relating to time in care (overall or most recent placement) and number of placements (Maclean, Taylor, & O'Donnell, 2017; Wiegmann, Putnam Hornstein, Barrat, Magruder, & Needell, 2014), and placement type (Wiegmann et al., 2014; Winokur, Holtan, & Batchelder, 2014), with poorer outcomes found for children who are older at care entry (Maclean et al., 2017; Sebba et al., 2015).

In addition to placement history, carer characteristics may affect children's outcomes. Some carers may lack the skills or resources to support children academically, as many have lower levels of education, face financial hardship, and experience stress and time demands related to children's higher behavioural needs or having insufficient support (Qu, Lahaussé, & Carson, 2018). Several qualitative studies interviewed young people with a care background who achieved well in their final year of secondary schooling, or enrolled in university. They highlighted the importance of carers valuing education and supporting young people's aspirations, creating a sense of belonging, facilitating study and attendance, and also found having more highly educated carers may support children's education (Jackson & Ajayi, 2007; Martin & Jackson, 2002; Skilbred, Iversen, & Moldestad, 2017). Supportive factors that may improve educational outcomes include services for developmental needs or tutoring (Forsman & Vinnerljung, 2012), and carer involvement in children's education (Jeynes, 2005).

As noted in qualitative studies such as Skilbred et al. (2017), a sense of belonging and security has been linked to better educational outcomes. The Aboriginal and Torres Strait Islander Child Placement Principle recognises the importance of Aboriginal children's connections with family, community and cultural identity (SNAICC, 2021). Although developed with general wellbeing rather than education in mind, it is worthwhile to explore whether these factors are related to educational achievement, given that, as outlined above, wellbeing and sense of belonging have been linked to achievement. The need to address inequities in outcomes for Aboriginal Australians across many areas including education is widely recognized (Australian Government, 2020).

Research examining the relationship between social work factors and educational outcomes is scarce (O'Higgins et al., 2017). An important strategy for meeting the needs of children in care is developing and implementing plans (e.g. education plans), with input and clear communication between the carer and caseworker (NSW Department of Communities and Justice, 2020a). Whether carer awareness of the plans, and other aspects of communication and caseworker satisfaction, or carer training, is actually associated with improved educational outcomes has not to our knowledge been previously examined.

Few studies have focused on positive educational outcomes for young people who experience care (Jackson & Ajayi, 2007; Martin & Jackson, 2002; Skilbred et al., 2017), and little is known about younger children who have experienced care and are achieving well. This study aims to describe characteristics and circumstances of Aboriginal and non-Aboriginal children with higher reading scores among Year 3 students in the Pathways of Care Longitudinal Study (POCLS), and predictors of higher achievement with a focus on child development, out-of-home care factors, services and supports.

Hypothesis 1. Higher reading scores will be more common among girls, non-Aboriginal children, children without a recorded disability, with fewer reports to child protection, with average or high cognitive test scores, and non-clinical behavioural wellbeing scores.

Hypothesis 2. Higher reading scores will be associated with the presence of supportive factors, such as carer involvement, help with homework, tutoring, accessing health and development services, family contact, and (for Aboriginal students) connection to culture.

Hypothesis 3. Higher reading scores will be associated with carer's demographics (higher education level, living in an advantaged area, younger age), and supports (training), satisfaction, and communication with the caseworker about planning for the child.

The study includes data collected from Aboriginal children and families. Interpretation of the data should consider the factors associated with the over-representation of Aboriginal children in child protection and care including the legacy of past policies of forced removal and the intergenerational effects of previous forced separations from family and culture. This erosion of community and familial capacity over time needs to be considered in any reform efforts as it continues to have a profoundly adverse effect on child development. Policy and practice should highlight strengths, develop Aboriginal-led solutions and ensure that better outcomes are achieved for Aboriginal people.

2. Method

2.1. Cohort and data sources

Prospective longitudinal interview data from the Pathways of Care Longitudinal Study (POCLS) was linked to administrative data from the New South Wales (NSW) Department of Communities and Justice (DCJ) and NSW Education Standards Authority. All children who first entered care in NSW between May 2010 and October 2011 were included in the overall POCLS study population ($n = 4126$). Of these, 2828 children went on to receive final care and protection orders by 30 April 2013; 1507 children (53.2 %) and their caregivers agreed to participate and completed at least one interview. Details of the study protocol are available in [Paxman, Tully, Burke, and Watson \(2014\)](#). This article includes all children who entered care and whose carer completed at least one interview prior to them completing National Assessment Program – Literacy and Numeracy (NAPLAN) reading tests in Year 3 of school ($N = 778$, [Fig. 1](#)), so that intervention had commenced and predictor variables were measured prior to the outcome. Children without NAPLAN reading scores were excluded (including young children not yet in Year 3 at school, children past Year 3 when NAPLAN was introduced in 2008 and 115 Year 3 students who were exempt, withdrawn or absent on the test day), along with children who did not enter care ($n = 138$) or complete an interview ($n = 111$) until after sitting NAPLAN. Five waves of data were collected between 2011 and 2020. This article used unweighted data from the first four waves that were available at the time analysis was undertaken. Interview data were extracted in November 2020, and updated NAPLAN data in March 2021.

The children sat the NAPLAN Year 3 reading test between 2012 and 2019, usually at 8–9 years old (97 %). As children varied in age at entry to the POCLS cohort, and NAPLAN was completed at Year 3 of school, timing of the interviews in relation to NAPLAN tests varied across children. The closest available POCLS interview they completed prior to their NAPLAN test was used. Over 80 % of the children were aged between 6 and 9 years old at their closest POCLS interview prior to the NAPLAN test, and the remaining 19 % were under 6 years at the interview. Just over half (53 %) were still in care at the time of the NAPLAN test.

Child protection data from NSW DCJ included children's gender and Aboriginal status, disability status, Risk of Significant Harm (ROSH) reports and care placements. The POCLS carer interview provided carer demographics and a range of items related to their satisfaction, supports and services received. Standardized assessments of child development from the POCLS interviews included the Child Behaviour Checklist (CBCL; [Achenbach, 1991](#)), the Matrix Reasoning Test from Wechsler Intelligence Scale for Children IV (WISC; [Wechsler, 2003](#)) and Peabody Picture Vocabulary Test IV (PPVT; [Dunn & Dunn, 2007](#)). Note that there are some issues regarding the lack of validation for standardized assessments within ethnic minority groups, and when the study was developed, many assessments had not been validated for Aboriginal children ([NSW Department of Communities and Justice, 2021](#)). For Aboriginal people in urban areas, non-verbal cognitive assessments such as the WISC Matrix Reasoning, general Australian population scoring norms were found to be appropriate, and are considered at less risk of providing a biased indication of ability than verbal cognitive assessments ([Westerman & Wettinger, 1997](#)). NAPLAN data was obtained from the NSW Education Standards Authority. The Socio-economic Index of Area (SEIFA in 2011) from the Australian Bureau of Statistics was used, as it was closest to care entry.

The study has ethics approval from the University of NSW Human Research Ethics Committee and Aboriginal Health and Medical

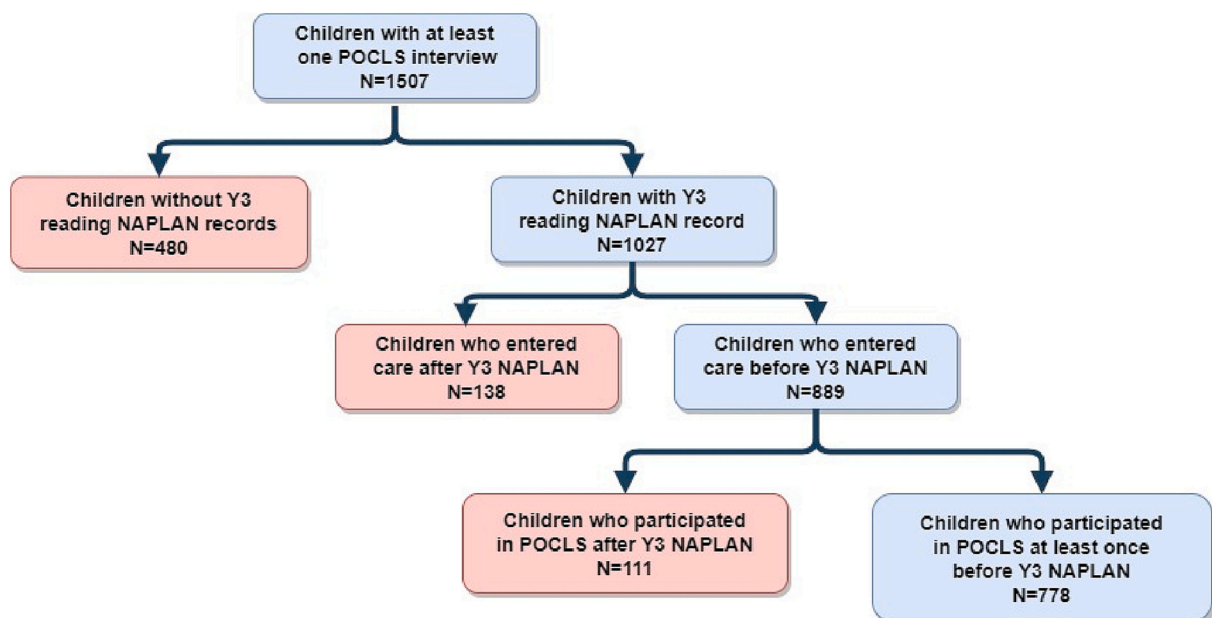


Fig. 1. Flow chart - cohort selection using interview data from Waves 1–4.

Note: Red-excluded; Blue-selected. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Research Council of NSW Ethics Committee.

2.2. Measures

2.2.1. Outcome variable – reading achievement

NAPLAN provides national standardized reading achievement data for the population of Australian children and indicates whether they are meeting National Minimum Standards of expected achievement for their year of schooling (ACARA, 2016). NAPLAN reading scores are measured relative to an assessment scale in Year 3, 5, 7 and 9 and grouped into 10 different performance levels or bands. Year 3 students' performance is measured in the first 6 bands. A binary variable was created classifying children as “higher achievers” if they scored in the top three bands of the Year 3 NAPLAN reading test, and “lower achievers” if they scored in the three lower bands.

2.2.2. Child's sociodemographic and background characteristics

Children's pre-care characteristics included gender, Aboriginality, and ROSH reports prior to entry to care.

2.2.3. Child development measures

Standardized measures were used to assess children's socio-emotional and cognitive development. Socio-emotional wellbeing was assessed using carer-reported CBCL Internalizing and Externalizing behavioural problems scales. Internalizing behaviour includes withdrawn, anxious or depressive symptoms, whereas externalizing behaviour includes aggression and rule breaking. Cognitive development was measured using the Peabody Picture Vocabulary Test (PPVT) to assess verbal skills and the Matrix Reasoning Test from the Wechsler Intelligence Scale for Children IV (WISC) for non-verbal cognitive development. In addition to standardized measures, the presence of a recorded disability was obtained from the DCJ child protection data. The disability status was current as at the time of data extraction in November 2020.

All standardized measures were scored using established cut-off points (NSW Department of Communities and Justice, 2020b). CBCL Internalizing and Externalizing scores were classified as ‘normal’ (<60), ‘borderline’ or subclinical (60–63, between 1 and 1.3SD above the mean) and ‘clinical range’ (>63, which is >1.3 SD above the mean). To address low cell counts in the analyses, some categories were aggregated. In the CBCL, normal and borderline categories were collapsed into ‘typical’ and contrasted with ‘clinical’ scores to assess the relationship between reading achievement and behavioural problems considered severe enough to require professional intervention.

Similarly, PPVT and WISC were classified as ‘above average’ (PPVT >115; WISC >13, 1 SD above the normative population means), average (PPVT 85–115; WISC 7–13, within 1 SD of the population mean) and below average (PPVT <85; WISC below 7, which equates to below 1 SD from the normative population means). To address low cell counts in the analyses, the WISC and PPVT categories of above average and average were combined to create a ‘typical’ category which was contrasted with ‘at risk’ or below average scores.

2.2.4. Child protection placement data

Children's out-of-home care placement characteristics (measured up to NAPLAN dates) included number of placements (1, 2–3 and 4 or more); total days in care; total days in last (or current) placement; predominant placement type in first period of care (most frequent placement type accounting for 50 % or more of placements: foster, kinship, other - note that 97 % of children had only 1 period of care which could include 1 or more placements); most recent placement type (foster, kinship, parents, other); and age at first care entry (0– < 2 years, 2– < 5 years, and 5–9 years).

2.2.5. Carer demographics

Carer information at interview included age (≤40 years, 41–50, 51–60, or ≥61 years) and education level (degree/diploma or higher, certificate or other non-school qualifications, Year 10–12, or Year 9 or less). Socio-economic Index of Area (SEIFA) described the carer's neighbourhood (1 = most disadvantaged to 5 = least disadvantaged).

2.2.6. Services and supportive factors - provided to the child

Carers reported on services and potential supports provided to the child including:

- 1) Carer involvement in schooling (summarizing the following POCLS variables coded as 1 if any of the school support was provided and 0 otherwise: contacted study child teacher, year coordinator, or principal; contacted the school counsellor; attended an education planning meeting for study child; attended an event which study child participated; attended an individual parent-teacher meeting);
- 2) Whether the child received ‘additional help or tutoring from outside household’;
- 3) Frequency of help with homework (few times a week/month versus less often);
- 4) Child received professional services related to health and developmental needs: A binary variable was created (Yes/No) using the following variables coded as Yes = 1 if the study child attended services and No = 0 if otherwise: Services related to health include Aboriginal medical service and GP; eye, ear, nose and throat; paediatrician and early childhood health centre; and services related to developmental needs include behavioural management services, occupational therapist, counselling or psychologist, physiotherapist and speech pathologist);

- 5) Connection to culture (including POCLS variables: Birth name is maintained, Birth language is practiced, Cultural identity and heritage is discussed, Attend key cultural and religious festivals and celebrations, Food is appropriate to culture and religion, Maintain an understanding of his/her religion, Religious practice is observed);

Table 1

Characteristics and background of higher achieving and other students.

			Reading achievement					
			Overall		Lower		Higher (top three bands)	
			N	%	N	%	N	%
N			778	–	430	54.0	348	46.0
Gender	Female		421	54.1	223	51.9	198	56.9
	Male		357	45.9	207	48.1	150	43.1
Aboriginality	Aboriginal		300	38.6	189	44.0	111	31.9
	Non-Aboriginal		478	61.4	241	56.0	237	68.1
SEIFA	1		176	22.6	103	24.0	73	21.0
	2		170	21.9	97	22.6	73	21.0
	3		219	28.1	125	29.1	94	27.0
	4		80	10.3	38	8.8	42	12.1
	5		65	8.4	26	6.0	39	11.2
	Missing		68	8.7	41	9.5	27	7.8
			114	14.7	77	17.9	37	10.6
Disability	Yes		114	14.7	77	17.9	37	10.6
	No		664	85.3	353	82.1	311	89.4
Numbers of ROSH before entry to care	0		<5	<1.0	<5	<1.0	<5	<1.0
	1–5		374	48.1	192	44.7	182	52.3
	6–10		199	25.6	114	26.5	85	24.4
	11–20		159	20.4	91	21.2	68	19.5
	>20		<50	<10.0	<50	<10.0	<20	<5.0
CBCL Internalizing	Normal range		599	77.0	324	75.3	275	79.0
	Borderline		45	5.8	22	5.1	23	6.6
	Clinical		91	11.7	56	13.0	35	10.1
	Missing		43	5.5	28	6.5	15	4.3
CBCL externalizing								
Externalizing	Normal range		469	60.3	246	57.2	223	64.1
	Borderline		68	8.7	33	7.7	35	10.1
	Clinical		199	25.6	124	28.8	75	21.6
	Missing		42	5.4	27	6.3	15	4.3
PPVT	Below average		113	14.5	88	20.5	25	7.2
	Average		535	68.8	281	65.3	254	73.0
	Above average range		49	6.3	12	2.8	37	10.6
	Missing		81	10.4	49	11.4	32	9.2
WISC	Below average range		128	16.5	93	21.6	35	10.1
	Average		402	51.7	197	45.8	205	58.9
	Above average range		36	4.6	13	3.0	23	6.6
	Missing		212	27.2	127	29.5	85	24.4
Number of placements	1		303	38.9	173	40.2	130	37.4
	2–3		277	35.6	149	34.7	128	36.8
	4+		198	25.4	108	25.1	90	25.9
Days in care			1199 (sd:978)		1150 (sd:942)		1264 (sd:1022)	
Days in last placement			945 (sd:920)		890 (sd:878)		1017 (sd:968)	
Most recent placement type	Foster Care		410	52.7	217	50.5	193	55.5
	Relative and Kinship		325	41.8	189	44.0	136	39.1
	Parents		30	3.9	18	4.2	12	3.4
	Others		13	1.7	6	1.4	7	2.0
Predominant period of care	Foster Care		369	47.4	192	44.7	177	50.9
Placement type	Kinship Care		388	49.9	228	53.0	160	46.0
	Other		21	2.7	10	2.3	11	3.2
Age at first entry to care	<24 months		412	53.0	214	49.8	198	56.9
	2–4 years		238	30.6	138	32.1	100	28.7
	5–9 years		128	16.5	78	18.1	50	14.4
Carer age	≤40 years		148	19.0	79	18.4	69	19.8
	41–50 years		260	33.4	135	31.4	125	35.9
	51–60 years		238	30.6	138	32.1	100	28.7
	≥ 61 years		114	14.7	71	16.5	43	12.4
	Missing		18	2.3	7	1.6	11	3.2
Carer highest education	Degree/diploma or higher		216	27.8	93	21.6	123	35.3
	Certificate/ other non-school		233	29.9	130	30.2	103	29.6
	Year 10–Year 12		216	27.8	136	31.6	80	23.0
	Year 9 or below		113	14.5	71	16.5	42	12.1

Table 2

Support/services to child and carer, all children.

	Reading achievement					
	Overall		Lower		Higher (top three bands)	
	N	%	N	%	N	%
Carer involvement in school						
`No	162	20.8	95	22.1	67	9.3
`Yes	616	79.2	335	77.9	281	80.7
Help from household with homework						
`Few times a week	473	60.8	256	59.5	217	62.4
`Few times a month	56	7.2	26	6.0	30	8.6
`Less often	29	3.7	16	3.7	13	3.7
`N/A	220	28.3	132	30.7	88	25.3
Additional help or tutoring from outside household						
`Yes	47	6.0	35	8.1	12	3.4
`No	515	66.2	265	61.6	250	71.8
`N/A	216	27.8	130	30.2	86	24.7
Receiving professional services since placement						
`GP or Aboriginal medical services	722	92.8	406	94.4	316	90.8
`Eye, ear, nose and throat	472	60.7	275	64.0	197	56.6
`Paediatrician	363	46.7	225	52.3	138	39.7
`Early childhood health centre	<5	<1.0	<5	<1.0	<5	<1.0
`Related to developmental needs	379	48.7	223	51.9	156	44.8
Cultural connection ^a						
`No	43	14.3	28	14.8	15	13.5
`Yes	257	85.7	161	85.2	96	86.5
Contact with father						
`No	374	48.1	212	49.3	162	46.6
`Yes	356	45.8	193	44.9	163	46.8
`N/A	48	6.2	25	5.8	23	6.6
Contact with mother						
`No	171	22.0	89	20.7	82	23.6
`Yes	559	71.9	316	73.5	243	69.8
`N/A	48	6.2	25	5.8	23	6.6
Contact with birth siblings						
`No	326	41.9	190	44.2	136	39.1
`Yes	404	51.9	215	50.0	189	54.3
`N/A	48	6.2	25	5.8	23	6.6
Education plan for the child						
`Yes	240	30.8	132	30.7	108	31.0
`No	324	41.6	179	41.6	145	41.7
`Dk	48	6.2	24	5.6	24	6.9
`N/A	166	21.3	95	22.1	71	20.4
Carers attend training in the last 12 months						
`No	459	59.0	268	62.3	191	54.9
`Yes	319	41.0	162	37.7	157	45.1
Carers' satisfaction with balancing care and family schedules						
`Very satisfied	492	63.2	275	64.0	217	62.4
`Satisfied	190	24.4	100	23.3	90	25.9
`Unsure	24	3.1	14	3.3	10	2.9
`Dissatisfied	<10	<5.0	<10	<5.0	<5	<5.0
`Very dissatisfied	<10	<5.0	<10	<5.0	<5	<5.0
`N/A	58	7.5	30	7.0	28	8.0
Satisfaction with being able to reach caseworker when need it						
`Very satisfied	352	45.2	193	44.9	159	45.7
`Satisfied	197	25.3	110	25.6	87	25.0
`Unsure	38	4.9	19	4.4	19	5.5
`Dissatisfied	56	7.2	33	7.7	23	6.6
`Very dissatisfied	41	5.3	22	5.1	19	5.5
`N/A	63	8.1	32	7.4	31	8.9
`Dk	31	4.0	21	4.9	10	2.9
Satisfaction with assistance from caseworker						
`Very satisfied	438	56.3	248	57.7	190	54.6
`Satisfied	174	22.4	88	20.5	86	24.7
`Unsure	30	3.9	18	4.2	12	3.4
`Dissatisfied	62	8.0	35	8.1	27	7.8
`Very dissatisfied	24	3.1	15	3.5	9	2.6
`N/A	50	6.4	26	6.0	24	6.9
Has caseworker explained care plan						
`Yes	120	15.4	74	17.2	46	13.2

(continued on next page)

Table 2 (continued)

	Reading achievement					
	Overall		Lower		Higher (top three bands)	
	N	%	N	%	N	%
`No	80	10.3	49	11.4	31	8.9
`N/A	578	74.3	307	71.4	271	77.9
Has caseworker explained health plan						
`Yes	114	14.7	72	16.7	42	12.1
`No	84	10.8	51	11.9	33	9.5
`N/A	580	74.6	307	71.4	273	78.4
Has caseworker explained family contact plan						
`Yes	133	17.1	83	19.3	50	14.4
`No	69	8.9	41	9.5	28	8.0
`N/A	576	74.0	306	71.2	270	77.6
Has caseworker explained Life Story book						
`Yes	138	17.7	80	18.6	58	16.7
`No	69	8.9	47	10.9	22	6.3
`N/A	571	73.4	303	70.5	268	77.0
Has caseworker explained cultural plan						
`Yes	30	3.9	21	4.9	9	2.6
`No	45	5.8	29	6.7	16	4.6
`N/A	703	90.4	380	88.4	323	92.8

Note: Out-of-home Care Education plans for children in care were no longer mandatory after 2018 when changes were made to the Out-of-home Care Education Pathway.

^a Aboriginal children only.

6) Contact with birth family – mother, father and siblings.

2.2.7. Services, supports and satisfaction – via the carer

This study also examined various factors including services, supports and satisfaction reported by carers including: 1) education plan for study child; 2) carer attended any training in past 12 months; 3) satisfaction balancing care with family needs; 4) satisfaction with being able to reach caseworker; 5) satisfaction with assistance from caseworker; 6) whether caseworker explained a) care plan b) health plan c) family contact plan d) cultural plan and e) Life Story book.

2.3. Analysis

Descriptive statistics provide a profile of higher achieving students within the POCLS cohort. Multivariable logistic regression analyses was used to examine the relationship between child characteristics, child protection history, carer demographics, services and supports, with reading achievement, adjusting for all other variables in the model. The main analysis involved three steps. First, a series of bivariate logistic regression analyses were undertaken in Stata Version 16.0 to assess factors associated with higher achievement. Second, multivariable logistic regression analysis was conducted with child demographic and developmental characteristics, child protection, and carer demographics variables included as covariates, to identify which were related to reading achievement in the adjusted model. Key child demographics and significant variables from the bivariate models were selected as the covariates in this model. Third, supports and services were added to the multivariable models.

Each of these three steps was conducted for both the overall cohort, and separately for Aboriginal and non-Aboriginal children. Results are presented using odds ratios (ORs) and 95 % confidence intervals (CIs). Results of logistic regression analyses are significant where confidence intervals do not include 1 (Tabachnick & Fidell, 2001). Odds ratios provided a measure of effect size. Effect sizes are considered weak if ORs are between 1.00 and 1.49, small-medium if between 1.50 and 2.49, medium-large if between 2.50 and 3.99, large if 4–9.99, very large if >10, and the inverse of each for negative associations (James, 1996). Supplementary descriptive analysis was conducted to further examine the relationship between care type and reading outcomes among Aboriginal students.

3. Results

3.1. Descriptive statistics

As Table 1 shows, 778 students were included in the analysis: 300 Aboriginal children (38.6 %) and 478 non-Aboriginal children (61.4 %). Overall, 46.0 % of the children scored in the top 3 reading bands. Like the POCLS cohort in its entirety, many of the higher achieving students faced multiple adversities, rather than reflecting a distinct subset with unique socio-economic, placement or cognitive ability advantages. Only 23.3 % of higher achievers had carers who lived in the two most socio-economically advantaged quintiles, somewhat more than lower achieving students (14.9 %). Many of the higher achieving children showed similar levels of disadvantage to the lower achievers (21.0 % and 24.0 % respectively had carers who lived in the most disadvantaged quintile). In addition, 10.6 % of the higher achieving group had a disability recorded, and 44.0 % had experienced 6–20 ROSH reports prior to

Table 3
Child and carer characteristics, Aboriginal children and non-Aboriginal children.

			Aboriginal Children Reading Scores (N = 300)				Non-Aboriginal Children Reading Scores (N = 478)			
			Lower		Higher (top three bands)		Lower		Higher (top three bands)	
			N	%	N	%	N	%	N	%
N			189	–	111	–	241	–	237	–
Gender	Female		104	55.0	68	61.3	119	49.4	130	54.9
	Male		85	45.0	43	38.7	122	50.6	107	45.1
SEIFA	1		60	31.7	36	32.4	43	17.8	37	15.6
	2		44	23.3	21	18.9	53	22.0	52	21.9
	3		49	25.9	29	26.1	76	31.5	65	27.4
	4		8	4.2	10	9.0	30	12.4	32	13.5
	5		6	3.2	10	9.0	20	8.3	29	12.2
	Missing		22	11.6	5	4.5	19	7.9	22	9.3
Disability	Yes		40	21.2	16	14.4	37	15.4	21	8.9
	No		149	78.8	95	85.6	204	84.6	216	91.1
Numbers of ROSH before entry to care	0		0	–	0	–	<5	<1.0	<5	<1.0
	1–5		89	47.1	59	53.2	103	42.7	123	51.9
	6–10		40	21.2	24	21.6	74	30.7	61	25.7
	11–20		45	23.8	19	17.1	46	19.1	49	20.7
	>20		15	7.9	9	8.1	<20	<5.0	<5	<5.0
CBCL internalizing cut off	Normal range		141	74.6	84	75.7	183	75.9	191	80.6
	Borderline		16	8.5	5	4.5	6	2.5	18	7.6
	Clinical		18	9.5	16	14.4	38	15.8	19	8.0
	Missing		14	7.4	6	5.4	14	5.8	9	3.8
CBCL externalizing cut off	Normal range		98	51.9	67	60.4	148	61.4	156	65.8
	Borderline		16	8.5	8	7.2	17	7.1	27	11.4
	Clinical		62	32.8	30	27.0	62	25.7	45	19.0
	Missing		13	6.9	6	5.4	14	5.8	9	3.8
CBCL total problems cut off	Normal range		106	56.1	73	65.8	155	64.3	163	68.8
	Borderline		18	9.5	7	6.3	16	6.6	24	10.1
	Clinical		52	27.5	25	22.5	56	23.2	41	17.3
	Missing		13	6.9	6	5.4	14	5.8	9	3.8
PPVT cut off	Below average		48	25.4	9	8.1	40	16.6	16	6.8
	Average		114	60.3	80	72.1	167	69.3	174	73.4
	Above average		5	2.6	10	9.0	7	2.9	27	11.4
	Missing		22	11.6	12	10.8	27	11.2	20	8.4
WISC cut off	Below average		42	22.2	15	13.5	51	21.2	20	8.4
	Average		94	49.7	61	55.0	103	42.7	144	60.8
	Above average		<5	<5.0	<5	<5.0	11	4.6	19	8.0
	Missing		<60	<30.0	<40	<30.0	76	31.5	54	22.8
Number of placements	1		60	31.7	35	31.5	113	46.9	95	40.1
	2–3		76	40.2	40	36.0	73	30.3	88	37.1
	4+		53	28.0	36	32.4	55	22.8	54	22.8
Days in care before NAPLAN			1369 (sd:926)		1505 (sd:1031)		1298 (sd:935)		1332 (sd:997)	
Days in last placement			1014 (sd:862)		1173 (sd:1025)		1019 (sd:907)		1065 (sd:949)	
Most recent placement type	Foster Care		92	48.7	72	64.9	125	51.9	121	51.1
	Relative and Kinship		95	43.0	40	33.9	120	42.1	101	42.6
	Parents		<15	<5.0	<5	<5.0	<10	<5.0	<20	<5.0
	Others		<5	<5.0	<5	<5.0	<5	<5.0	<10	<5.0
Predominant placement type in first period of care	Foster Care		86	45.5	71	64.0	106	44.0	106	44.7
	Kinship Care		98	51.9	38	34.2	130	53.9	122	51.5
	Residential Care		<5	<5.0	<5	<5.0	<5	<5.0	<5	<5.0
	Other		<5	<5.0	<5	<5.0	<10	<5.0	<10	<5.0
Age at first entry to care	<24 months		105	55.6	66	59.5	109	45.2	132	55.7
	2–4 years		50	26.5	36	32.4	88	36.5	64	27.0
	5–9 years		34	18.0	9	8.1	44	18.3	41	17.3
Carer 1 age at first interview	≤40 years		37	19.6	25	22.5	42	17.4	44	18.6
	41–50 years		60	31.7	45	40.5	75	31.1	80	33.8
	51–60 years		58	30.7	33	29.7	80	33.2	67	28.3
	≥ 61 years		33	17.5	6	5.4	38	15.8	37	15.6
	Missing		1	0.5	2	1.8	6	2.5	9	3.8
Carer highest level of education	Degree/diploma or higher		38	20.1	39	35.1	55	22.8	84	35.4
	Certificate or other non-school		62	32.8	31	27.9	68	28.2	72	30.4
	Year 10-Year 12		52	27.5	28	25.2	84	34.9	52	21.9
	Year 9 or below		37	19.6	13	11.7	34	14.1	29	12.2

entering care. The proportion of higher achievers was similar among children currently in care and those who had exited care prior to NAPLAN (45.6 % and 43.8 % respectively).

Most higher achieving children had average cognitive test scores (Table 1). Children with above average cognitive test scores comprised a smaller portion of the cohort, but were often higher achievers. One in ten higher achieving children scored below average on non-verbal cognitive tests. Around 1 in 5 higher achieving children (21.6 %) and 1 in 4 lower achieving children (28.8 %) had clinical levels of externalizing behaviour. Internalizing problems were less common (10.1 % of higher and 13.0 % of lower achieving students).

The care histories of higher achieving children were variable and broadly similar to the cohort overall. Half the higher achieving children had foster care as their predominant placement in their first period of care, and 46.0 % had kinship care. Just over 1 in 3 had one placement, a similar proportion had 2–3 placements, and the remaining one in four higher achieving students had 4 or more placements prior to NAPLAN tests. The most common highest level of carer's education among higher achieving children was a degree or diploma (35.3 %). A smaller proportion of lower achieving children had a carer with a degree or diploma (21.6 %), 30.2 % had a certificate, 31.6 % had completed Year 10–12, and 16.5 % had completed Year 9 or less. Over half (56.9 %) of higher achieving students had entered care before two years of age, with 49.8 % of lower achieving children entering care by this age. Detailed crosstabulation of age of entry by achievement group (not shown) showed that 48–49 % of children who entered care aged under two were higher achievers, with the lowest percentage of higher achievers among those who entered care aged 5 (36.8 %).

Supports and services for children and carers are shown in Table 2. Around 4 out of 5 carers indicated they were involved with schooling (such as carer contacting a teacher, attending an event etc). Only 47 children were reported to have additional help or tutoring from outside the home (35 from the lower achieving group).

3.2. Profile of higher achieving Aboriginal and non-Aboriginal students

Table 3 describes the characteristics of Aboriginal and non-Aboriginal children in higher and lower reading achievement groups. Overall, 37.0 % of Aboriginal and 49.7 % of non-Aboriginal students were in the higher achieving group. More higher achieving Aboriginal students were girls (61.3 %) than boys (38.7 %), partly due to the higher number of Aboriginal girls (57.3 %) than boys (42.7 %) in the study. Higher achieving Aboriginal students faced even higher levels of adversities than the overall POCLS cohort, with 32 % having carers in the most disadvantaged neighbourhoods, and 14.4 % having a disability. Contrary to expectations, only 34.2 % of higher achieving Aboriginal children were predominantly in kinship care, compared to 51.9 % of lower achieving children. Only 5.4 % of higher achieving Aboriginal children had carers aged over 60, compared to 17.5 % of lower achieving Aboriginal children. These results were explored further in supplementary analysis. Among non-Aboriginal children, reading achievement did not vary across placement type and carer age variables.

A similar proportion of Aboriginal children (80.0 %) and non-Aboriginal children (78.7 %) had carers who indicated they were involved in school (such as contact with teachers or attending events). Aboriginal students more often received tutoring or other help outside the home, but rates were still low (11.4 % of Aboriginal children and 6.4 % of non-Aboriginal children who were of school age at the interview and carer answered the question). Among higher achieving Aboriginal children, a higher proportion of carers reported an education plan (40.5 %), compared to lower achieving children (31.2 %). Among non-Aboriginal children, this figure was 26.6 % for higher achievers and 30.3 % among lower achievers.

Table 4
Logistic Regression: predictors of higher reading achievement, all children.

Variable (reference group)		Bivariate	Multivariable Model 1	Multivariable Model 2
		OR (95%CI)		
Aboriginality (No)	Aboriginal	0.6 (0.44–0.8)*	0.61 (0.41–0.91)*	0.61 (0.41–0.92)*
Gender (Male)	Female	1.21 (0.91–1.61)	1.35 (0.91–1.98)	1.38 (0.93–2.05)
Disability (No)	Yes	0.55 (0.36–0.83)*	0.58 (0.31–1.1)	0.61 (0.32–1.18)
SEIFA (1 high disadvantage)	2	1.06 (0.69–1.63)	0.89 (0.52–1.52)	0.84 (0.48–1.46)
	3	1.06 (0.71–1.59)	0.85 (0.51–1.43)	0.87 (0.52–1.46)
	4	1.56 (0.92–2.65)	1.14 (0.58–2.23)	1.24 (0.63–2.46)
	5	2.12 (1.19–3.78)*	1.17 (0.53–2.59)	1.29 (0.58–2.88)
PPVT (At risk)	Typical	3.50 (2.18–5.61)*	2.05 (1.12–3.76)*	2.06 (1.11–3.82)*
WISC (At risk)	Typical	2.88 (1.87–4.44)*	2.59 (1.56–4.28)*	2.61 (1.57–4.35)*
CBCL internalizing (Clinical)	Typical	1.38 (0.88–2.16)	0.94 (0.47–1.85)	0.90 (0.45–1.81)
CBCL externalizing (Clinical)	Typical	1.53 (1.1–2.13)*	1.65 (1.02–2.67)*	1.71 (1.04–2.82)*
Number of ROSH before entry (1–5)	6–10	0.79 (0.56–1.11)	0.81 (0.51–1.28)	0.82 (0.51–1.32)
	11–20	0.79 (0.54–1.15)	0.78 (0.47–1.29)	0.76 (0.45–1.28)
	>20	0.40 (0.2–0.79)*	0.57 (0.24–1.34)	0.57 (0.24–1.39)
Carer highest education (\leq Year 9)	Degree/diploma or higher	2.24 (1.4–3.57)*	2.24 (1.22–4.13)*	2.29 (1.23–4.27)*
	Certificate or other	1.34 (0.84–2.12)	1.39 (0.77–2.52)	1.33 (0.73–2.43)
	Year 10–Year 12	0.99 (0.62–1.59)	0.94 (0.51–1.73)	0.94 (0.51–1.75)
Additional help or tutoring from outside household (No)	Yes	0.36 (0.18–0.72)*		0.29 (0.12–0.66)*
Carer attended training in the last 12 Months (No)	Yes	1.36 (1.02–1.81)*		1.46 (0.97–2.18)

* $p < .05$.

3.3. Logistic regression analyses

3.3.1. Bivariate (unadjusted) results, all children

In the entire cohort, bivariate results showed that a range of child, carer and support factors were significantly associated with achievement (Table 4). The largest effect sizes were for typical PPVT (OR = 3.50 [95 % CI 2.18–5.61]) and WISC scores (OR = 2.88 [95 % CI 1.87–4.44]) which were positively associated with achievement, whereas tutoring (OR = 0.36 [95 % CI 0.18–0.72]) and having >20 ROSH reports compared to 1–5 (OR = 0.40 [95 % CI 0.2–0.79]) were associated with reduced likelihood of higher achievement.

Small-medium effect sizes were found for carers having a degree or diploma compared to <Year 10 (OR = 2.24 [95 % CI 1.4–3.57]), least versus most disadvantaged SEIFA (OR = 2.12 [95 % CI 1.19–3.78]), disability (OR = 0.55 [95 % CI 0.36–0.83]), Aboriginality (OR = 0.60 [95 % CI 0.44–0.80]), and typical externalizing scores versus clinical scores (OR 1.53 [95 % CI 1.10–2.13]). A weak effect was found for carers having attended training in the past year.

3.3.2. Multivariable results, all children

In the full multivariable analysis (Multivariable model 2, Table 4), large effects were found for tutoring (OR = 0.29 [95 % CI 0.12–0.66]), and typical compared to 'at risk' WISC scores (OR = 2.61 [95 % CI 1.57–4.35]). Small-medium effects were found for higher carer education levels, typical PPVT score and typical CBCL externalizing (associated with higher achievement), and Aboriginality (associated with reduced odds of higher achievement), after adjusting for other variables in the model.

3.3.3. Bivariate (unadjusted) results, Aboriginal children

Table 5 shows the logistic regression results for Aboriginal children. Bivariate logistic regressions showed a large effect size for PPVT with children with 'typical' range scores more likely to be higher achievers than children with 'at risk' scores (OR = 4.03 [95 % CI 1.88–8.65]). A medium-large effect size was found for carers age over 60 years (OR = 0.27 [95 % CI 0.10–0.74]), tutoring (OR = 0.29 [95 % CI 0.09–0.86]) caseworker explained life story book (OR = 3.43 [95 % CI 1.04–11.3]) and carer education degree or diploma (OR = 2.92 [95 % CI 1.35–6.33]). Small-medium effect sizes were found for age of entry to care 5–9 years (lower odds of higher achievement compared to entry <2 years old), predominant care type kinship (lower odds compared to foster care), education plan (increased odds), and receiving professional services related to developmental needs (lower odds). A weak effect size was found for most recent placement type kinship (lower odds compared to foster care).

Table 5
Logistic Regression: predictors of higher reading achievement: Aboriginal children.

Predictor (reference group)		Bivariate OR (95%CI)	Multivariable Model 1	Multivariable Model 2
Gender (male)	Female	1.29 (0.8–2.08)	1.59 (0.75–3.36)	1.54 (0.66–3.6)
Disability (no)	Yes	0.63 (0.33–1.18)	0.46 (0.15–1.42)	0.66 (0.17–2.62)
SEIFA (1 high disadvantage)	2	0.8 (0.41–1.55)	0.51 (0.19–1.4)	0.35 (0.12–1.07)
	3	0.99 (0.53–1.83)	0.67 (0.26–1.72)	0.63 (0.22–1.82)
	4	2.08 (0.75–5.76)	2.62 (0.6–11.41)	2.25 (0.4–12.52)
	5	2.78 (0.93–8.29)	1.01 (0.22–4.51)	1.52 (0.27–8.7)
PPVT (At risk)	Typical range	4.03 (1.88–8.65)*	2.91 (0.92–9.23)	2.3 (0.6–8.81)
WISC (At risk)	Typical range	1.9 (0.97–3.7)	2.18 (0.89–5.33)	2.09 (0.75–5.84)
CBCL internalizing (Clinical range)	Typical range	0.64 (0.31–1.31)	0.41 (0.13–1.33)	0.36 (0.1–1.35)
CBCL externalizing (Clinical range)	Typical range	1.36 (0.8–2.3)	3.62 (1.42–9.23)*	2.58 (0.85–7.82)
Predominant care type on entry (Foster care)	Kinship Care	0.47 (0.29–0.77)*	1.02 (0.34–3.08)	1.24 (0.35–4.41)
	Other	0.48 (0.09–2.57)	Omitted	Omitted
Most recent placement type	Relative and kinship	0.53 (0.32–0.87)*	0.46 (0.15–1.44)	0.48 (0.13–1.79)
	Parent	0.28 (0.06–1.36)	Omitted	Omitted
	Other	0.85 (0.14–5.23)	1.29 (0.13–12.84)	2.47 (0.14–43.72)
Age at first entry to care(<24 months)	2–4 years	1.15 (0.68–1.94)	2.82 (1.12–7.13)*	2.64 (0.97–7.18)
	5–9 years	0.42 (0.19–0.93)*	0.74 (0.27–2.06)	0.43 (0.09–2.03)
Carer highest level of education (≤Year 9)	Degree/diploma or higher	2.92 (1.35–6.33)*	2.3 (0.7–7.56)	3.37 (0.87–13.05)
	Certificate or other on school	1.42 (0.66–3.06)	1 (0.31–3.27)	1.22 (0.33–4.58)
	Year 10–Year 12	1.53 (0.7–3.35)	0.75 (0.21–2.64)	0.91 (0.22–3.78)
Age of carer at interview (<40)	41–50 years	1.11 (0.59–2.1)	0.96 (0.34–2.71)	1.21 (0.38–3.86)
	51–60 years	0.84 (0.43–1.63)	0.68 (0.23–2)	0.76 (0.23–2.51)
	≥ 61 years	0.27 (0.1–0.74)*	0.15 (0.03–0.72)*	0.12 (0.02–0.7)*
Additional help or tutoring from outside household	Yes	0.29 (0.09–0.86)*		0.19 (0.03–1.19)
Receiving professional services since placement- Related to developmental needs	Yes	0.57 (0.36–0.92)*		0.32 (0.12–0.82)*
Education plan for the child	Yes	1.75 (1–3.06)*		1.43 (0.57–3.59))
Has caseworker explained Life Story book	Yes	3.43 (1.04–11.3)*		1.99 (0.48–8.21))

* $p < .05$.

3.3.4. Multivariable results, Aboriginal children

The full multivariable analysis for Aboriginal children (Multivariate model 2 in Table 5) showed that after adjusting for other variables, there was a large effect size for carers age of carer 61 years and over compared to under 41 (OR = 0.12 [95 % CI 0.02–0.7]). A medium-large effect size was found for receiving professional services related to developmental needs (OR = 0.32 [95 % CI 0.12–0.82]). Two additional variables were significant in the model that included all of the child, carer and child protection history variables but not supports and services (Multivariate model 1 in Table 5). Age at entry to care at 2–4 years old compared to under 2 years old years and typical compared to clinical range externalizing scores were associated with increased odds of higher reading achievement, but were not significant after supports and services were added to the model. Caution should be applied in interpreting the results of split group analysis due to smaller sample sizes.

3.3.5. Bivariate (unadjusted) results, non-Aboriginal children

Among non-Aboriginal children, a medium-large effect size was found for typical cognitive test scores compared to 'at risk' scores (WISC: OR = 3.65 [95 % CI 2.06–6.45]); PPVT OR = 2.89 [95 % CI 1.56–5.34]), typical CBCL internalizing scores compared to clinical scores (OR = 2.21 [95 % CI 1.23–3.97]), and having a disability (OR = 0.54 [95 % CI 0.3–0.95]).

3.3.6. Multivariable results, non-Aboriginal children

The full multivariable analysis (Multivariate model 2 in Table 6) showed a medium-large effect size for children with 'typical' WISC scores compared to 'at risk' scores, after adjusting for the other variables (OR = 3.45 [95 % CI 1.77–6.73]). A small-medium effect size was found for contact with birth siblings (OR = 1.81 [95 % CI 1.08–3.02]) after adjusting for other factors. Children whose carers had attended training in the last 12 months were also more likely to have higher achievement (OR 1.77 [95 % CI 1.04–3.01]) in the multivariable model. Before adding supports and services variables to the model, age of entry to care 2–4 years was significantly associated with a decreased odds of higher reading achievement compared to children who entered care earlier (Multivariate model 1 in Table 6).

3.4. Supplementary analyses, Aboriginal children in kinship care

In light of the findings showing a link between worse reading outcomes for Aboriginal children in kinship care and those with older carers, further descriptive statistics were undertaken to assess characteristics of these families that may help to a) explain these findings and b) potentially identify areas for more targeted support. Cross-tabulations for selected characteristics, broken down by care arrangement (kinship versus not in kinship) and reading achievement for Aboriginal children were created (see supplementary material).

Kinship care families had a number of other characteristics associated with lower reading achievement. A higher proportion of carers of Aboriginal children in kinship care (40.4 %) lived in the most socio-economically disadvantaged neighbourhoods compared to non-kinship carers (25.0 %). Kinship carers were often older: 58.8 % of kinship carers were aged over 51 years, with 20.6 % aged 61 years and older. In comparison, 30.5 % of non-kinship carers were aged over 51 years, with 6.7 % aged over 61 years. Boys comprised a greater proportion of Aboriginal children in kinship care (47.1 %) than non-kinship care (39.0 %). A smaller proportion of kinship carers had a degree, diploma or higher (16.2 % versus 33.5 % of non-kin carers), had attended training in the past year (27.9 % versus 59.1 %), reported having an education plan (25.0 % compared to 42.7 %), and reported having received services related to developmental needs (40.4 % compared to 54.9 %). Conversely, Aboriginal children in kinship care were less likely to be rated by carers as having clinical levels of externalizing (20.6 %) and internalizing behaviours (6.6 %) on the CBCL compared to the non-kinship care group (externalizing 39.0 % and internalizing 15.2 %).

Table 6

Logistic Regression: predictors of higher reading achievement: non-Aboriginal children.

		Bivariate OR (95%CI)	Multivariable Model 1	Multivariable Model 2
Gender (male)	Female	1.22 (0.85–1.75)	1.1 (0.68–1.79)	1.11 (0.67–1.82)
Disability (no)	Yes	0.54 (0.3–0.95)*	0.66 (0.28–1.52)	0.72 (0.3–1.7)
SEIFA (1 high disadvantage)	2	1.14 (0.64–2.04)	1.12 (0.53–2.33)	0.98 (0.46–2.08)
	3	0.99 (0.57–1.72)	0.86 (0.44–1.69)	0.83 (0.41–1.66)
	4	1.24 (0.64–2.41)	1.01 (0.45–2.26)	1.13 (0.49–2.57)
	5	1.69 (0.82–3.46)	1.17 (0.43–3.17)	1.26 (0.45–3.51)
PPVT (below average)	Typical	2.89 (1.56–5.34)*	1.79 (0.83–3.84)	2.02 (0.92–4.46)
WISC (below average)	Typical	3.65 (2.06–6.45)*	3.03 (1.58–5.79)*	3.45 (1.77–6.73)*
CBCL internalizing (clinical range)	Typical	2.21 (1.23–3.97)*	1.94 (0.78–4.82)	1.94 (0.77–4.9)
CBCL externalizing (clinical range)	Typical	1.53 (0.99–2.37)	1.24 (0.66–2.33)	1.62 (0.84–3.15)
Age at first entry to care (<24 months)	2–4 years		0.57 (0.33–0.98)*	0.61 (0.35–1.06)
	5–9 years		0.66 (0.35–1.22)	0.77 (0.4–1.46)
Contact with family-siblings(no)	Yes			1.81 (1.08–3.02)*
Carer attended any training in the past 12 months	Yes			1.77 (1.04–3.01)*

* $p < .05$.

4. Discussion

The aim of this study was to describe the characteristics and circumstances of higher Year 3 reading achievement among children who experienced care. We found that 46.0 % of students in the cohort scored in the higher reading achievement category (top 3 NAPLAN reading bands). Given the many adversities these children face, it is not surprising that this figure is lower than in NSW's general Year 3 student population (74.1 %) (ACARA, 2016).

Higher achieving children within the POCLS cohort were a diverse group. They came from a range of SES levels, varied in cognitive ability and socio-emotional wellbeing, included Aboriginal and non-Aboriginal children, boys and girls. They shared many of the adversities common in the POCLS cohort: almost twice as many had carers who lived in the two most disadvantaged SEIFA quintiles as in the two least disadvantaged quintiles, almost a quarter had >10 ROSH reports and the majority had more than one placement.

4.1. Child and environmental factors associated with reading outcomes

Measures related to the child and their environment were predictive of achievement in the overall cohort. Both verbal (PPVT) and non-verbal (Matrix Reasoning from WISC-IV) cognitive test scores were significant predictors of reading achievement. Having a disability was associated with lower likelihood of higher reading achievement. Not surprisingly, previous research has shown that measures of ability, disability, and past achievement are strongly associated with subsequent achievement (Maclean et al., 2016; Marks, 2014). Nonetheless, some children with above average cognitive test scores, and many with average cognitive test scores, were in the lower achieving group, suggesting a number of students are capable of higher levels of reading performance than they are currently achieving. Previous research has found that for children with multiple risk factors, high IQ is not enough to protect against poor educational outcomes in the longer term (Gutman, Sameroff, & Cole, 2003).

We found externalizing behaviour problems were associated with 70 % decreased odds of higher reading achievement. Previous research also shows a link between behaviour problems and academic difficulties (Smart et al., 2017). The link may be bi-directional: Behaviour problems can affect children's ability to participate and learn optimally, and children who are struggling academically may act out (Morgan, Farkas, Tufis, & Sperling, 2008) or both may result from a common cause such as home environment (Wang & Algozzine, 2011). Where children have both low academic achievement and behaviour problems, it is recommended that interventions target both issues (Smart et al., 2017; Wang & Algozzine, 2011). These findings emphasize the importance of implementing the Out-of-Home Care Health Pathway including assessment and treatment of the complex physical, social-emotional, developmental and sometimes mental health needs children entering care may have. It is important to address not only children's cognitive / academic skills but also their emotional and behavioural wellbeing, and the presence of relationships that support children's sense of belonging, identity and security.

The analysis highlighted a number of environmental factors that can affect children's reading development. Carer education level and living in a low socioeconomic area were both associated with children's reading achievement. Aboriginal children were also less likely to be in the higher achieving group which is likely due to various social correlates such as socio-economic factors, expectations for the child's educational future, racism, or living in regional or remote areas with less access to services (Zubrick et al., 2006). The multifactorial influences on reading outcomes emphasize the importance of collaborative, multi-agency solutions including child protection, education, health and early childhood services.

4.2. Predictors of reading achievement among Aboriginal children

The educational gap between Aboriginal and non-Aboriginal children is already well established (Zubrick et al., 2006), and we therefore focussed on which Aboriginal children are achieving well, and which factors are associated with achievement and could potentially be targeted to improve educational outcomes among Aboriginal children. The resilience of higher achieving Aboriginal children is noteworthy given the high levels of adversity they faced even compared to the already disadvantaged general cohort of children entering care.

Although child factors such as verbal cognitive test scores, age at entry to care, and externalizing behaviour were significant in some of the analyses, among Aboriginal children more carer factors were found to be significant, with lower reading achievement associated with carers aged over 60 years in the full model, and higher achievement among children with highly educated carers, and foster carers compared to kinship carers in the bivariate analysis. Further analysis found that among carers of Aboriginal children in the POCLS, kinship carers were more likely than foster carers to be older, have completed less education, and live in more disadvantaged areas. A higher proportion of Aboriginal boys were in kinship care, compared to foster care. Kinship care families also received fewer supports and services.

These findings align with previous research showing kinship carers tend to be older, less well off financially, have lower education levels, are less likely to receive support and training or participate in support groups or social activities with other carer families, and have less caseworker contact than foster carers (Gebel, 1996; Qu et al., 2018). One U.S. study found kinship carers with lower education levels were intimidated by the education system and consequently were reluctant to engage with it, however a school-based intervention resulted in increased levels of self-efficacy among kinship carers in supporting the educational needs of the children in their care (Strozier, McGrew, Krisman, & Smith, 2005). Research with kinship carers would be valuable to ascertain if similar (or other) barriers affect kinship carers in Australia, particularly older kinship carers of Aboriginal children, with programs developed accordingly. Overall, kinship carers have higher support needs but are less likely to actually receive support (Gebel, 1996; Qu et al., 2018). Strategies to engage and support kinship carers to improve educational outcomes are needed.

4.3. Predictors of reading achievement among non-Aboriginal children

For non-Aboriginal children, the WISC cognitive test had the largest magnitude of association with reading achievement, with children with typical scores having almost three and a half times increased odds of higher reading achievement compared to children with below average WISC scores, after accounting for the other variables. Other child development measures (recorded disability, PPVT and CBCL internalizing) were no longer significant after accounting for other factors. Age at entry was also significant in multivariable model 1 (which did not include services and supports), with infants showing the best outcomes. Younger age at entry has previously been linked to higher reading achievement (Maclean et al., 2016). In the full multivariable model, two service and support variables were associated with reading outcomes. The carer having attended training in the past 12 months was significantly associated with higher reading achievement. Further research could investigate whether this reflects a direct benefit of training, and which training courses were associated with more positive reading achievement, or whether this reflected underlying characteristics or circumstances of the carer, such as motivation or having sufficient time and resources available to travel to and attend training, which could also be reflected in the carer's motivation and capacity to help children with their reading. If training has a direct impact on carer's capacity to improve children's educational outcomes, this should be used strategically to lift academic achievement of children in care. The second support factor associated with higher reading achievement was sibling contact. Although this result was only found in one analysis, it aligns with research literature stating the importance of maintaining sibling relationships for children in care, given that sibling relationships are the longest relationships most people have during their lifetime (Sen & Broadhurst, 2011).

4.4. Services and supports

It is promising to see some of the supports and services factors associated with better reading outcomes, but findings were inconsistent across analyses. The carers reporting an education plan, carer training, contact with siblings and caseworker having explained the Life Story book were each associated with higher reading achievement in some analyses. While consistent with qualitative research suggesting a focus on education, effective parenting skills, and a sense of belonging are helpful for academic success (e.g. Jackson & Ajayi, 2007), further research is needed to assess robustness of these findings, and trajectory analysis to assess whether these supports are associated with better education outcomes over time.

The current findings highlight the need for DCJ, Education, NGO providers and carers to implement the Out-of-home Care (OOHC) Education Pathway to improve children's educational outcomes, along with the Out-of-home Care Health Plan to address socio-emotional and behavioural needs that can impact on education. In particular, there is a need for on-entry assessments, and ongoing monitoring, with services provided in a timely and culturally appropriate manner to address the individual needs of the child. From 2010 all children and young people in statutory care in NSW should have participated in the Out-of-Home Care Education Pathway (information on Out-of-Home Care Education Pathways provided by M. Paxman, personal communication, January 19, 2022). In 2018 the NSW Department of Education changed the operation of the Out-of-Home Care Education Pathway so that it was no longer mandatory to develop an Out-of-Home Care Education Plan for all children in statutory care. Children now have learning and support planning initiated for them within 30 days of entering care or starting a new school but there is no requirement for a formal Education Plan to be developed. All Aboriginal young people who attend a NSW Government school must have a Personalised Learning Pathway Education Plan developed in accordance with their individual needs as part of the Personalised Learning and Support Planning process. Other recent initiatives related to the Out-of-Home Care Education Pathway include a number of workshops undertaken and new online training modules to promote implementation of the Out-of-Home Care Education Pathway to DCJ and NGO caseworkers are being finalized. Research to assess the impact of these changes on educational outcomes for children who experience care is recommended.

Few children received tutoring or other help outside the home. The finding of lower reading achievement among children who received tutoring almost certainly reflects selection bias and reverse causality: tutoring is often provided to the children who are struggling most at school. Previous research suggests it is a beneficial intervention for children in care (Forsman & Vinnerljung, 2012). The worse outcomes of children who received professional services related to developmental needs likely reflects the same mechanism, with children at greater risk of educational difficulties more likely to both need and receive services. More intervention studies are needed to determine which supports are most effective in improving achievement (Forsman & Vinnerljung, 2012).

Given the effect of having more highly educated carers, it has previously been suggested that agencies should recruit more highly educated carers. This could be considered as one strategy particularly for foster care; however there are also important benefits to kinship placements where the child already has loving relationships. Although the self-report form of the CBCL means there could be systematic differences in responding, we found a lower proportion of Aboriginal children in kinship care were reported to have clinical levels of internalizing and externalizing problems, suggesting these arrangements had positive socio-emotional outcomes, but were less well positioned to help children thrive academically. Consideration should therefore be given as to how to enable and support kinship (and other) carers to best help children's educational development. It would be useful to understand the various mechanisms through which more educated carers promote reading development, whether it's time spent on educational activities, habits and values around education, higher expectations, or confidence engaging with the school and advocating on the child's behalf.

When selecting variables to target in interventions, the prevalence and malleability of a variable should be considered in conjunction with its effect size to optimize the effectiveness and value for money of interventions aiming to improve reading outcomes.

4.5. Limitations and strengths

The study had several limitations. We did not have data on school factors such as school SES or teaching quality/education interventions. No corrections for potential measurement error were applied to the NAPLAN data. Some caution needs to be applied in interpreting findings from analysis of subgroups as a larger sample may allow more factors to reach significance and improve robustness. It is important to note that the interview took place some time after children entered care, thereby providing a baseline assessment relatively early in their care history rather than a pre-care assessment. The findings also focus only on one age group, and may not be generalizable to older age groups. It was not possible to conduct attrition analyses, and there may be differences between our participants and those who did not participate for various reasons.

In selecting a cut-off for higher achievement, we opted for one that would capture an adequate proportion of students as they progress through school. In the general population, more students in lower year levels score in higher bands: 28.4 % of all Year 3 students in NSW in 2016 scored in their year level's top reading band compared to only 6.3 % of Year 9 students. Further, a much smaller proportion of children who experienced care score in higher bands than in the general population. Thus, any cut-off selected will err towards appearing overly inclusive for Year 3 s or overly stringent for Year 9 s. Likewise, a cut-off that is inclusive for the general population will be narrow among care cohorts. We selected a cut-off of the top three bands for "higher achievement", which represents the 46.0 % highest achieving Year 3 s in the POCLS cohort. These students are at least two bands above Band 2, the National Minimum Standard for Year 3 students. We acknowledge that a limitation of using the less stringent cut-off is that among the younger cohort 'higher achieving' may be best considered 'higher achieving among children who have entered care'.

As some of the services and support variables were quite blunt (e.g. tutoring or accessing professional services variables did not differentiate by type and quantity, and caregiver involvement in school does not differentiate between attending a concert versus a meeting), effects may be less apparent than when using detailed measures of the nature, quantity and quality of each support and service.

Despite these limitations the study had many strengths. The POCLS study provides rich data linking interviews to administrative data, and follows a cohort of children over time. The use of administrative data provides information gathered prior to care and information that can be collected even if children return home, and allows collection of sensitive information such as child maltreatment reports that parents may be reluctant to provide details of in an interview. NAPLAN provides an objective, standardized outcome measure with results that can be compared across the Australian population of children and with other studies of educationally vulnerable children. This study adds significantly to the literature regarding educational achievement for children who have experienced care, taking into account variables relating to the child, their development, their care histories and carer characteristics as well as supports and services. Future research could examine mediation pathways for indirect effects of variables that influence cognitive ability and wellbeing, and assess whether findings vary based on gender, location or reunification status.

Research is scarce regarding the children who have experienced care and are achieving well academically. Whereas past studies of higher achievers have typically used qualitative methods and convenience samples of young adults, the present study provides a snapshot of higher achieving students early in their schooling journey. Using a full cohort, it provides new information on how many children who have experienced care are achieving well in Year 3 and their characteristics, care histories, supports and service factors. The study provides a baseline from which to further examine how children progress over time and which factors are linked to continued achievement or patterns of catchup reading growth.

Funding

Funding was provided for this study by the NSW Department of Communities and Justice.

Data availability

The authors do not have permission to share data.

Acknowledgements

We would like to acknowledge the Pathways of Care Longitudinal Study working group who provided the data and technical support for the study, the NSW Department of Communities and Justice who provided data and funding to support this study, NSW Education Standards Authority who provided data, and the children, young people and caregivers who participated in the study.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.chiabu.2023.106282>.

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