



Name: United Way Australia

Submission date: 4/06/2025

Participant background

1. For the purposes of this consultation, which of the following best describes you:
I am an organisation that provides or coordinates care services
2. Which of the following care sectors will your feedback relate to? Please select all that apply.
Early childhood education and care
3. What kind of care supports, services and programs do you have experience with, and in what jurisdictions?
The participant did not respond to this question.

1. Reform of quality and safety regulation to support a more cohesive care economy

1. To what extent do differences in quality and safety regulation make it costly or complex to provide or access care services?
The participant did not respond to this question.
2. What are the reasons for your answer?
The participant did not respond to this question.
3. To what extent should quality and safety regulations be more aligned across the different care service sectors and jurisdictions?
The participant did not respond to this question.
4. What are the reasons for your answer?
The participant did not respond to this question.

2. Embed collaborative commissioning to increase the integration of care services

1. What is your experience with collaborative commissioning
The participant did not respond to this question.
2. What are the benefits of pursuing greater collaborative commissioning?
The participant did not respond to this question.
3. What are the barriers to collaborative commissioning, and do you have any suggestions for solutions that would lead to better collaboration in the commissioning of care services?
The participant did not respond to this question.

3. A national framework to support government investment in prevention

1. What are the main barriers to governments investing in evidence-based prevention programs across the care economy?

United Way Australia (UWA) is a community impact organisation that helps children and young people to thrive, using proven, targeted initiatives. We work with governments, the philanthropic sector, business and communities, seeking to effect long-term outcomes for children, families and the nation.

In our experience, the barriers to governments investing in evidence-based prevention programs for young children include:

(a) Poor appetite for funding innovation and research by sector stakeholders: governments tend not to invest in evidence generation (outside the university sector), leaving it to stakeholders in the early years sector to fund their own development and evaluation of prevention programs. Impact organisations thus have no choice but to spend significant time and resources seeking funding from other sources (for example, philanthropic or corporate donors). With governments largely absent from this arena, the process of ideation, innovation and evidence generation in programs for children is far slower, and far more limited in scope, than it should be.

(b) Resistance to longer-term funding of prevention programs: even when non-government organisations do secure government funding for prevention programs, it is typically short-term. This reflects a broader political reluctance to fund programs whose outcomes may not be visible within an election cycle.

2. What are some examples of successful prevention programs (this could include discontinued programs)?

Programs developed and/or implemented by UWA provide insights into the enormous potential of preventative interventions in the early years (birth-5 years):

(a) Check Ups Before School (CUBS) in Mount Druitt (NSW)

CUBS was developed in response to the high number of young children in Mount Druitt not receiving developmental health checks, and starting school with undiagnosed health and learning challenges. Led by a multi-disciplinary team – a Nurse, a Speech Pathologist and a Health Linker – CUBS delivered developmental assessments and health supports to children (0-5 years) at early learning centres and community sites. UWA delivered the program as a pilot (2019-2022), with the goal of proving its worth and embedding it into mainstream service delivery. At the end of 2022, Western Sydney Local Health District took over operation of the CUBS program.

The NSW Government acknowledged the impact of the CUBS program in its own policies. In late 2022, the Government began a pilot of early childhood developmental checks in preschools, expanding the program until it became statewide. Today, all ECEC services in NSW are able to offer 4-year-old health and development checks, in partnership with their local health district.

Funded by: United Way Australia (charity)

Delivered by: United Way Australia and Western Sydney Local Health District

Outcomes achieved: Greater take-up of childhood developmental health screenings, greater identification of developmental challenges and referrals to specialists, greater understanding of early childhood development among parents/carers in a marginalised community.

Evaluations conducted: Grace, R., Woodrow, C., Johnston, C., Ballantyne, C. (2022). Check-ups Before School (CUBS) Final Report of the Pilot Study. Centre for Transforming early Education and Child Health, Western Sydney University. <https://doi.org/10.26183/47e2-fr80>

(b) The Imagination Library in Tamworth (NSW)

The Imagination Library provides one age-appropriate book each month to children from birth to age five. By providing books directly into homes and offering reading tips, the program encourages shared book reading within the family - a key factor in early literacy development.

In Australia, the Imagination Library program is most heavily embedded in the Tamworth region. Since 2019, more than 98% of children born in Tamworth have been enrolled in the program. By participating in the Imagination Library, families, public libraries, health services and early childhood education services in Tamworth have created an entire community dedicated to building children's literacy.

(While this example focuses on Tamworth, the Imagination Library model has been implemented across 400 communities in Australia, and more than 47,000 children are enrolled nationally — demonstrating strong potential for scalable, place-based early literacy intervention.)

Funded by: Tamworth Regional Council, charities (including United Way Australia, Rotary and Country Women's Association) and an extensive list of local businesses (private capital) - see link for full list.

Delivered by: Tamworth Regional Council and United Way Australia

Outcomes achieved: Children in Tamworth are being read to more often, for longer durations and have more books in the home than the average Australian child. The number of children in Tamworth being read to by a caregiver daily (for 10+ minutes) is double the national average; and caregivers in Tamworth who read daily to their child upon entering the Imagination Library program were five times more likely to still be reading daily when their child turned 3 years old. As a result, children in Tamworth were twice as likely as their peers elsewhere in Australia to develop key early literacy skills. Consultancy dandolopartners has calculated the return on investment in the Imagination Library program as \$9.90 for every \$1.00 of investment.

Evaluations conducted: Galea, C., Robidoux, S., Salins, A., Noble, C., & McArthur, G. (2024). The Impact of Shared Book Reading on Children and Families: A Study of Dolly Parton's Imagination Library in Tamworth, Australia. *Journal of Research in Childhood Education*, 1–30. <https://doi.org/10.1080/02568543.2024.2322731>

Galea, C., Jones, A., Ko, K., Salins, A., Robidoux, S., Noble, C. and McArthur, G. (2025). Home-based shared book reading and developmental outcomes in young children: a systematic review with meta-analyses. *Frontiers in Language Sciences* 4:1540562. <https://doi.org/10.3389/flang.2025.1540562>

dandolo partners (2025). *Imagination Library – Return on investment*, May 2025. Research commissioned by United Way Australia.

3. How can governments better support investment in prevention activities that have broad and long-term benefits for the Australian community?

Governments must play a catalytic role in the development of early intervention and prevention activities that support children in the early years (birth-5 years). A mountain of evidence tells us that investing in learning, development and health in the first five years pays dividends throughout the life course, and across communities and the national economy.

Governments need to be agile, flexible and patient in funding and supporting the development of prevention activities in the early years sector. It is crucial to listen to community voices, and to respond to challenges and opportunities that may be unique to particular communities. We should therefore avoid 'one size fits all' approaches; each partnership between early years stakeholders and government(s) may look slightly different. It is also essential that governments encourage robust, longitudinal evidence-gathering on the impacts of prevention activities.

Investing early leads to substantial long-term savings across education, health, and justice systems. Programs like the Imagination Library demonstrate both immediate and intergenerational value — improving school readiness while fostering stronger family and community engagement.

In terms of concrete steps to improve national performance, governments in Australia could do some/all of the following:

(a) take on an explicit coordination or advisory role, helping individuals and organisations in the early years sector to identify evidence-based interventions and programs. We note that both the Australian Institute of Family Studies (AIFS) and the Australian Education Research Organisation (AERO) make a contribution in this area, but their scope and resourcing is very limited.

(b) fund policy and program 'incubators' in the early years sector, focused on prevention, to encourage innovation

(c) fund more longitudinal research for the care economy, focused on young children and their families

(d) move beyond the artificial divides between 'education', 'health', and 'social services' when it comes to devising, funding and evaluating programs to support young children

(e) provide multi-year funding, tied to measurable outcomes, allowing community organisations to plan, evaluate, and improve programs over time.

Cover sheet: Supporting document #1



The Impact of Shared Book Reading on Children and Families: A Study of Dolly Parton's Imagination Library in Tamworth, Australia

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The Impact of Shared Book Reading on Children and Families: A Study of Dolly Parton's Imagination Library in Tamworth, Australia

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ABSTRACT

This longitudinal cohort-study investigated the impact of Dolly Parton's Imagination Library (the Imagination Library) in Tamworth, Australia. The Imagination Library delivers age-appropriate books to children from the time of their birth until their fifth birthday. Caregivers of Tamworth children completed surveys about their experience with the program after receiving one book ("baseline," $N = 343$) and then at six months ($N = 116$) and three years ($N = 89$). Their responses indicated that children in the Imagination Library were read to more frequently, for longer durations, and had more books in their homes than the average Australian child, as represented by large independent databases. Tamworth caregivers who read to their child at least once a day at baseline were nearly five times more likely to read daily after six months and three years than those who did not read daily at baseline (OR 4.9 (95% CI 1.8,13.7)). Further, children who were read to daily at three years showed more emerging literacy skills than those who were not read to daily. These outcomes suggest that shared book reading generally, and the Imagination Library specifically, encourages sustained reading practices that are associated with developing emerging literacy skills.

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KEYWORDS

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home literacy environment;
shared book reading

Shared book reading occurs when one person reads a book to another person. Typically, the reader is an adult (e.g., a caregiver or teacher) and the listener is a child (e.g., at home) or group of children (e.g., in the classroom). Sometimes, shared book reading involves discussions about written words, pictures, or the meaning of the story, but this is not imperative (Celano et al., 1998).

Shared book reading exposes children to more advanced language than other everyday activities, such as play situations (Duursma, 2014; Sénéchal et al., 1996). In 2019, Logan et al. (2019) found that children who are read one picture book a day for the first five years of their lives are exposed to around 1.4 million more words than if they are read to less than two days a week. It is, therefore, unsurprising that shared book reading is associated with enhanced language and vocabulary growth (Dowdall et al., 2020; Noble et al., 2019), including phonological awareness (Parpucu & Ezmeci, 2023) and phonological memory (National Early Literacy Panel, 2008). Such emerging literacy skills have been found to relate to later reading success (Roberts et al., 2005), which is why some education jurisdictions have claimed that shared book reading is important for building skills that may benefit a child for the rest of their life (Kalb & van Ours, 2014; Theriot et al., 2003).

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Given the perceived importance of shared book reading for children (Debaryshe, 1993; Theriot et al., 2003), several community-based book gifting programs have been developed, including Reach Out and Read, BookStart, and Dolly Parton's Imagination Library. These programs give free books to caregivers via community book distribution and activities. Although these programs all involve the gifting of books, they differ significantly in the quantity and timing of delivery, and strength of supporting evidence.

Reach Out and Read was established in the United States of America (USA) in 1989 and is a national pediatric literacy program that promotes early literacy and school readiness in nearly 5,000 clinics nationwide. The program gifts books to children during their six-monthly "well-child" visits to a physician. Children receive up to 10 books by their fifth birthday (de Bondt et al., 2020). At the well-child appointment, the physician provides information on the importance of reading to a child from birth, as recommended by the American Academy of Pediatrics (Jimenez et al., 2019).

A variety of studies have examined Reach Out and Read. For example, in 1999, Golova et al. (1999) conducted a randomized controlled trial ($N=65$ intervention, $N=70$ control) with low-income Hispanic families using bilingual books. Interviews before and after the program suggested that caregivers ($N=65$) were 10 times more likely to read to their child at least three days per week than those who were not in the program. A few years later, Mendelsohn et al. (2001) collected interview and quantitative data from Hispanic or African American caregivers of children in the program for three years ($N=49$) or three months ($N=73$). The former was found to experience more frequent shared book reading than the latter and had superior receptive and expressive vocabulary. The following year, Sharif et al. (2002) reported that 100 children in New York who were in the program had higher scores for home literacy and receptive (but not expressive) vocabulary than 100 children who were not in the program.

Two years later, caregiver interview and observational data collected by Weitzman et al. (2004) suggested a positive relationship between the number of books (up to six) received by children and their home literacy environment, their preference/requests for shared book reading, and the frequency of shared book reading. A more recent caregiver survey study by Thakur et al. (2016) discovered that the proportion of caregivers ($N=210$) who read to their children more than four days a week increased from 56% before the program to 80% during the program. In the same year, survey and quantitative data measures collected by Kumar et al. (2016) from adolescent caregivers suggested that participation in the program ($N=14$) led to more frequent shared book reading and reduced maternal depression than those not in the program ($N=14$). Finally, six years later, a survey study conducted by Crosh et al. (2022) found that Chicago caregivers in the program ($N=150$) read more frequently to their children than caregivers outside the program ($N=50$).

It is important to note findings from a systematic review by Yeager Pelatti et al. (2014), which aimed to assess the methodological quality of Reach Out and Read studies that examined experimental or quasi-experimental designs. This review, which included 11 appropriate studies, identified many methodological limitations, and suggested caution around interpreting the findings of such studies. Thus, research to date suggests that Reach Out and Read may help support the home literacy environment and some types of language development, but the strength of this support is currently limited by the mixed quality of studies conducted.

The BookStart program, which has been implemented in England, Northern Ireland, and Wales since 1992, is based on the rationale that young children read to every day will benefit educationally, culturally, socially, and emotionally. It sends one or two free books to a child's family soon after their birth and then when they are 3 to 4 years old. There are fewer studies about BookStart than Reach Out and Read. In 2000, Wade and Moore (2000) investigated a longitudinal sample of $N=43$ children from Birmingham when they first received the books (at nine months). When they were in Year 2, the BookStart children achieved higher mean scores than a non-BookStart control group ($N=41$) in reading and math on Standard Assessment Tests. More recently, O'Hare and Connolly (2014) conducted a randomized controlled trial with 96 families in Ireland who were sent a one-off BookStart pack when their child was 2 years old (two books, a coloring book, a pack of

crayons, a bedroom frieze, a set of bookplate stickers, a list of recommended toddler books, and a parent guide). The survey responses of BookStart caregivers indicated more positive attitudes to reading than those of 107 non-BookStart families. In the same year, van den Berg and Bus (2014) reported on the survey responses of 359 families who received a single BookStart package (a baby book, CD, and flyer about book sharing). These suggested that their children might have slightly better language development at age 15 months than 225 children who did not receive a package. In contrast, a very recent study by de Bondt and Bus (2022) found no difference between BookStart children ($N = 293$) and non-BookStart children ($N = 178$) for the home literacy environment at eight months or 5 years on language and literacy skills at 5 years. Considered together, the results of these studies are somewhat contradictory. For the home literacy environment, O'Hare and Connolly (2014) found a positive effect, while de Bondt and Bus (2022) found no effect; for language, van den Berg and Bus (2014) found an effect and de Bondt and Bus (2022) found no effect. Both studies included decent sample sizes; therefore, the association between the BookStart program and these variables is currently unclear.

Dolly Parton's Imagination Library (the Imagination Library) sends children an age-appropriate, culturally inclusive book every month from birth to 5 years (i.e., 60 books; Conyers, 2012). The program's purpose is to inspire a love of reading in children and build their own libraries before starting school (Neyer et al., 2021). In 2014, a quantitative survey study of 170 caregivers in New York reported that length of enrollment in the Imagination Library over 10 months was positively related to frequency of daily reading regardless of a child's or caregiver's demographics (e.g., age, gender, race, income, or level of education; Ridzi et al., 2014). In addition, qualitative data collected from a subgroup of 17 families suggested that families experienced an increase in communication, love of reading, and quality shared time, after just three months in the program (Neyer et al., 2021). A quantitative study by Samiei et al. (2016) revealed that kindergarten students ($N = 143$) who participated in the Imagination Library program prior to kindergarten had higher mean scores for early language skills than students who were not in the program ($N = 120$). A more recent quantitative study by Waldron (2018) found that 114 kindergarten students who participated in the Imagination Library program for between 1 and 2 years had better concepts about print and letter identification than 280 children who were not in the program at age 5 years. Finally, a quantitative study by Tura et al. (2023) found that caregivers with children who were enrolled in the Imagination Library program for over a year ($N = 204$; 12–25+ months) reported more frequent and sustained reading practices than children enrolled for less than a year ($N = 75$; 0–11 months). These findings suggest that participation in the Imagination Library may be associated with improved levels of shared book reading, book appreciation, family interactions, emerging literacy skills, and later academic outcomes.

It is particularly important to consider a recent systematic review of shared book reading in children (up to 9 years) by de Bondt et al. (2020) that included studies of Reach Out and Read, BookStart, and Dolly Parton's Imagination Library. A meta-analysis estimated that, on average, these programs are associated with higher metrics for the home literacy environment (Cohen's $d = 0.31$) and children's emerging literacy-related skills ($d = 0.29$). Three more meta-analyses – one for each program – estimated that the association between shared book reading and the home literacy environment is stronger for the Imagination Library ($d = 0.50$) than for Reach Out and Read ($d = 0.28$) and BookStart ($d = 0.25$). This may be because the Imagination Library (1) provides considerably more books (one book per month for 60 months) than Reach Out and Read and BookStart (four to 10 books in total), (2) does not require a caregiver to take a child to a medical appointment in order to receive a book but rather delivers the book to the home, (3) provides monthly support to caregivers through guided “tip sheets,” and/or (4) all children within an entire community can be given the opportunity to join the program. However, de Bondt et al. (2020) also reported that the quality of evidence for the Imagination Library and BookStart programs was not as strong as for Reach Out and Read. Thus, there is a need for more methodologically sound studies of the potential impacts of the Imagination Library.

Current study

Our summary above of existing Imagination Library studies reveals three key methodological strengths and weaknesses. In terms of strengths, it is reassuring that, with just one exception ($N = 17$; Neyer et al., 2021), previous studies have recruited reasonable sample sizes ($N = 114$ to 204). Sample size helps define statistical power, which is particularly important for a new field of study with unknown effect sizes. It is also reassuring that prior studies have employed qualitative as well as quantitative analyses. Qualitative analyses can be particularly useful in a new area of study since they can explore and reveal knowledge to a depth that is beyond a quantitative study. This is why they often have smaller sample sizes.

In terms of weaknesses, most previous studies have researched the potential impacts of the Imagination Library over a limited period of time (3 months to around 1 year; Neyer et al., 2021; Ridzi et al., 2014) or have not reported length of enrollment (Samiei et al., 2016). Since the Imagination Library delivers one book per month, this equates to 3 to 12 books. This limited time period may underestimate the strength of the association between the Imagination Library and outcomes such as shared book reading frequency (Ridzi et al., 2014).

Considering these strengths and weaknesses, the current study was designed to use both quantitative and qualitative analyses, with adequate statistical power based from known effect sizes reported by previous studies with good sample sizes, to measure the strength of the association between the Imagination Library and three outcomes over three years: (1) the home literacy environment (shared book reading frequency, shared book reading duration, and the number of books in the home); (2) reading attitudes and interactions; and (3) children's emerging literacy skills (concepts about print, alphabet knowledge, receptive vocabulary, expressive vocabulary, phonological awareness, and phonological memory).

Methods

Ethics approval

The quantitative and qualitative survey data presented in this study were collected by United Way Australia (UWA) according to its ethical rules and regulations. UWA is a community impact organization distributing the Imagination Library books across Australia since 2014. UWA provided the authors of this study with de-identified data for analysis, which was approved by Macquarie University (HREC 12106).

UWA and Macquarie University created a joint PhD position in 2022 for the first author to address two related, but different, goals. Reading scientists at Macquarie University were interested in understanding if shared book reading has an impact on cognitive and socioemotional skills in young children – as has often been claimed without the support of strong evidence. UWA were interested in determining if the Imagination Library has an impact on cognitive and socioemotional skills in young children, as assessed by more rigorous scientific methods than used previously.

The Imagination Library

The Imagination Library mails an age-appropriate book each month from birth until the child's 5th birthday. In Australia, the books are chosen by a selection committee who come from a variety of backgrounds, including: librarians, early childhood teachers, academics, a speech pathologist, and Aboriginal and Torres Strait Islander Peoples. The books selected focus on a variety of cultures, including Aboriginal and Torres Strait Island culture, and the books also represent different disabilities. Each book is accompanied by tip sheets that provide information on ways to approach shared book reading and related activities.

In Tamworth, distribution of the Imagination Library is supported by the Central Northern Regional Library, which provides demonstrations during Baby Book Time on reading the Imagination Library books to children as well as support for caregivers to do the same.

For a detailed description of the implementation of Dolly Parton's Imagination Library in Tamworth, New South Wales (NSW), Australia, please see [Appendix 1](#).

Location

A community-wide implementation of the Imagination Library commenced on January 1, 2019, in Tamworth. This region is approximately 410 kilometers northwest of Sydney and covers nearly 10,000 square kilometers (1 million hectares). It has a population of over 63,000, with 12.7% identifying as Aboriginal and/or Torres Strait Islander (3.2% for Australia) and includes many remote smaller communities (Australian Bureau of Statistics [ABS], 2021). Based on ABS census data, the proportion of people who speak English as a first language is similar in Tamworth to all of Australia (68% and 72%, respectively), as is the proportion of people working full time (53% to 56%). However, the proportion of those with a university degree is lower in Tamworth (12%) than the rest of Australia (26%) (ABS, 2021).

Recruitment

In Tamworth, a Child Health Nurse at Tamworth Hospital conducted a standard newborn hearing test on every child. During the study period, the nurse returned the results of the hearing test to the caregiver with a leaflet about the Imagination Library program, an introductory children's book, and an enrollment form. The latter was completed by the Child Health Nurse and caregiver together (98% uptake), which was delivered to the Tamworth City Library team, who then registered the child into the Imagination Library Book Ordering System (Dollywood Foundation, TN, USA). Registered families were sent a child's library membership card, a welcome letter from the mayor, and information about community connecting events at Tamworth City Library, such as Baby Book Time.

Procedure

The surveys were sent via e-mail by UWA staff using the online survey platform SurveyGizmo (now Alchemer); each took seven to 10 minutes to complete. Caregivers were asked to complete the survey for the first child enrolled into the Imagination Library in their household. Therefore, only one survey per household was completed for the same child at each time point. The survey was only available in English and all caregivers were required to be over the age of 18 years to participate. (See [Appendix 2 Table A1](#) for a summary of the demographic data collected for both the caregiver and child at all three time points, along with the questions for each of the three sections: home literacy environment, reading attitudes and interactions, and emerging literacy skills.)

Statistical power

Sample size estimation was undertaken post-baseline survey data collection. With 80% power, a sample size of $N = 85$ at three years was calculated to ensure sufficient data, which enabled the investigation of moderate correlation coefficients (StataCorp, 2016). An attrition rate of 25% based on previous longitudinal studies on shared book reading (de Bondt & Bus, 2022; Senechal & LeFevre, 2002) was anticipated.

Sample

A total of 635 caregivers were enrolled in the program between January 1, 2019 and March 15, 2020. This time frame was chosen as Australia entered a nationwide lockdown due to COVID-19 on March 18, 2020.

Although the book distribution continued throughout the entire time of COVID-19, the surveying methodology was interrupted in March 2020.

There were 343 surveys completed by caregivers after they had received the Imagination Library book (the “baseline (B)” sample). Thirty-six months later (i.e., three years), 263 caregivers (77% of 343) were still enrolled in the program (Note: $80/343 = 23\%$ attrition), with the clue being provided by returned books through Australia Post that were labeled “return to sender” (i.e., United Way Australia or Tamworth City Library) due to a change of address (this suggests that one key factor for drop-out is that children were no longer in Tamworth). Of these 263 caregivers, 89 (34%) completed the three-year survey (the “baseline +36 months [B + 36]” sample). Within the overall sample, 56 (63% of 89) had also completed a survey at six months (the “baseline +6 months +36 months [B + 6 + 36]” sample). [Figure 1](#) provides a flow chart of participation and attrition for each sample.

The retention rate of 77% in this study was slightly lower than a previous study on the Imagination Library (84%, Anderson et al., 2019). However, the Anderson et al. study only followed participants for 1 year. Considering shared book reading studies that followed participants for at least 2 years, the

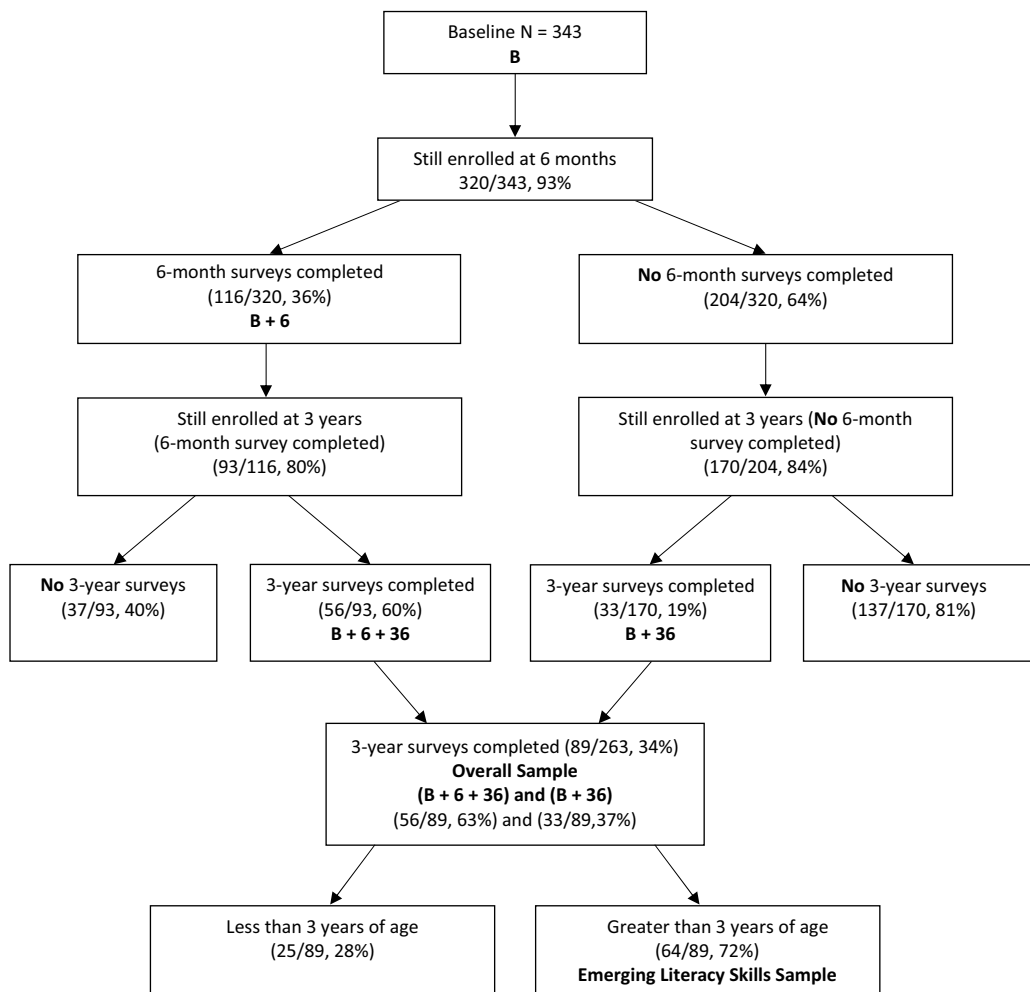


Figure 1. Participant flow diagram.

average retention rate is 72% (Attig & Weinert, 2020; Deckner et al., 2006; Farrant & Zubrick, 2013; Marjanovič-Umek et al., 2017; Paulson et al., 2009; Tomopoulos et al., 2006). Thus, our retention rate of 77% is slightly better than previous studies on shared book reading.

Demographics

Table 1 reports descriptive statistics for the demographic data of the caregivers and their children for each stage of survey data collection. At baseline, caregivers identified their children as female (52%) or male (48%), with a mean age of 1.9 months, with 13% attending some form of early learning activities. At three years, the children were identified as female (45%) or male (55%), with a mean age of 39 months and 82% attending some form of early education.

At three years, all caregivers identified as parents (88% mothers), except one (a grandparent). Caregivers were aged 41–45 (9%), 36–40 years (36%), 31–35 years (33%), and 21–30 years (21%). All but three caregivers reported English as the primary language in the home. In terms of occupation, 28/89 (32%) worked full-time, 40/89 (45%) worked part-time or casual, and 21/89 (24%) provided home duties. Forty-six percent of caregivers reported that their highest attainment of education level was high school/diploma/TAFE, and 54% stated that they had obtained a university degree.

Socioeconomic status was indexed at the Local Government Area (LGA) as recommended by the Australian government (see Appendix 1). All residents within the same postcode are assigned the same

Table 1. Descriptive statistics.

	Baseline (B) (N = 343)	6 months (B + 6) (N = 116)	3 years (B + 36) (N = 89)
Child demographics	N (%)	N (%)	N (%)
Gender			
Male	164 (48%)	53 (46%)	49 (55%)
Female	179 (52%)	63 (54%)	40 (45%)
Age Mean (SD)	1.9 m (2.1)	8.0 m (1.5)	39 m (3.5)
Early Learning Activities			
Any	46 (13%)	39 (34%)	73 (82%)
None	297 (87%)	77 (66%)	16 (18%)
Disability			
Yes	—	—	4 (4%)
No	—	—	85 (96%)
Caregiver demographics			
Age bracket			
21–30 years	—	—	19 (21%)
31–40 years	—	—	29 (33%)
41–50 years	—	—	32 (36%)
>50 years	—	—	1 (1%)
Primary language spoken at home			
English	329 (96%)	114 (98%)	87 (98%)
Language other than English	14 (4%)	1 (1%)	2 (2%)
Missing	—	1 (1%)	1 (1%)
Education			
High School/Diploma/TAFE	197 (57%)	24 (21%)	41 (46%)
University	129 (38%)	39 (34%)	48 (54%)
Missing	17 (5%)	53 (46%)	0 (0%)
Employment			
Full-time	—	—	28 (32%)
Part-time/casual	—	—	40 (45%)
Home duties	—	—	21 (24%)
Children in Household			
Enrolled	—	—	129
not enrolled	—	—	90

level using an Index of Relative Socio-economic Disadvantage (IRSD). Tamworth is represented by a single postcode and hence all caregivers had an index of 5/10, which represents a moderate level of disadvantage (Australian Bureau of Statistics, 2016).

When comparing the caregiver and child demographics in the three groups who (1) completed baseline but were no longer enrolled at three years, (2) completed baseline and were enrolled at three years but did not complete the survey, and (3) completed the baseline survey (see Supplementary Table S1), the only difference between the three groups was in the caregiver’s highest education level. Specifically, those that were no longer enrolled were more often of lower education. Please note that 20% of the data for this variable was missing.

Books

A total of 3,242 age-appropriate and culturally sensitive books were delivered during the study. The median number of books per child was 39 (range 33–46). The word count for each book ranged from seven to 583 words per book. The median number of words per book was 285 (IQR 118–404).

Quantitative outcomes

The outcomes of this study were guided by the National Early Literacy Panel’s (2008) review of studies of the home literacy environment and language development in preschool children (National Early Literacy Panel, 2008), as well as research conducted by Payne et al. (1994). These outcomes have been illustrated by the Dollywood Foundation in the Logic Model framework shown in Figure 2. The home literacy environment outcomes (shared book reading frequency, shared book reading duration, and the number of books in the home) and reading attitudes and interactions fall under the short-term outcomes, and children’s emerging literacy skills (concepts about print, receptive vocabulary, and children’s emerging literacy skills)

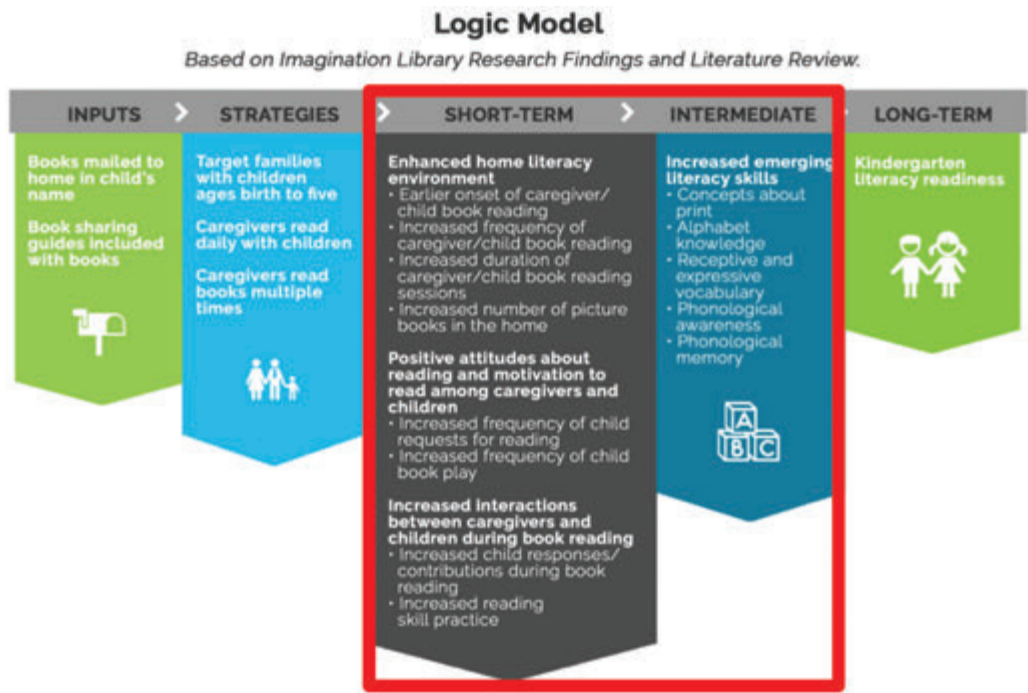


Figure 2. Dollywood Foundation logic model.

expressive vocabulary, phonological awareness, and phonological memory) fall under the intermediate outcomes. [Appendix 2 Table A1](#) outlines what questions were asked and at which time points.

Home literacy environment

Caregivers responded to three survey items for the home literacy environment. Each item asked caregivers to respond using a different format, as described below. Responses produced skewed distributions due to low frequencies, and so were analyzed as dichotomized or ordinal outcomes. For frequency of book reading, dichotic values were less than daily versus daily or more, and ordinal values were less than three days per week, three to five days per week, or six or more days per week. Duration of shared book reading had just dichotic values (less than 10 minutes versus 10 or more minutes), as did number of children's books in the home (24 or less versus 25 or more) (see [Appendix 2 Table A1](#)).

Reading attitudes and interactions

Caregivers responded to nine survey items about the reading attitudes and interactions of children, caregivers, and the community. A variety of response options were used: five-point Likert scales, yes/no responses, and free-text writing (see [Appendix 2 Table A1](#)).

Emerging literacy skills

Caregivers responded to 11 items adapted from the Baillet Emergent Literacy Screener and the Early Language Scales (Baillet et al., 2018; Visser-Bochane et al., 2021). There were two survey items per skill except for phonological memory, which had one item. Caregivers responded to each item with rarely (score = 0), sometimes (1), or often (2). Each skill was represented by a summed score (i.e., a score of 0, 1, 2, 3, or 4, except for phonological memory, which was 0 or 1). The six summed scores were dichotomized, where caregivers reported often for both questions versus all other combinations of responses (see [Appendix 2 Table A1](#)).

Qualitative outcomes

One conclusion from Ridzi et al. (2017) was that future research into the Imagination Library should collect qualitative feedback to explore wider benefits from the program. The surveys for this study therefore included a single open-ended free-text statement: "If you would like to share additional feedback on the program or notes on this survey, you are welcome to do so here."

Quantitative analyses

Home literacy environment

For the three items administered at baseline, six months, and three years, we calculated the percentage of caregivers who selected each ordinal or dichotomized value on the relevant scale (e.g., for the number of children's books in the home, 4% selected none, 18% selected 10–24, 67% selected 25–100, and 11% selected more than 100). We then compared these percentage values between baseline and three years (the B + 6 + 36 and B + 36 sample; $N = 89$) and also between baseline, six months, and three years (B + 6 + 36 sample; $N = 56$; see [Table 2](#)).

We used the percentage scores to compare caregiver responses in our two samples to those collected by two large independent Australian databases: the Longitudinal Study of Australian Children (LSAC; Australian Government Department of Social Services, 2022), and Australia's Children (Australian Institute of Health and Welfare [AIHW], 2017). The LSAC data were collected when children were under 1 year old ($N = 5,107$; 2004) and again when they were two to three years old ($N = 4,606$; 2006). The relevant items for this study were: frequency of shared book reading (every day six to seven days in the previous week) and duration of shared book reading (average minutes the child

Table 2. Summary of shared book reading frequency.

	Full Sample Baseline (B) (N = 343)	6-month sample Baseline (N = 116)	6-month (B + 6) (N = 116)	Subgroup sample 3-year data (B + 6 + 36) (N = 56)	3-year sample Baseline (N = 89)	3-year sample Overall sample (B + 6 + 36 and B + 36) (N = 89)
Frequency of reading						
Not applicable, too young	54 (16%)	16 (14%)	2 (2%)	0 (0%)	10 (11%)	0 (0%)
Once every few months	5 (2%)	1 (1%)	1 (1%)	0 (0%)	1 (1%)	2 (2%)
Once a month	3 (1%)	1 (1%)	2 (2%)	1 (2%)	0 (0%)	0 (0%)
Once a fortnight	6 (2%)	2 (2%)	0 (0%)	0 (0%)	1 (1%)	0 (0%)
Once a week	35 (10%)	7 (6%)	3 (3%)	1 (2%)	10 (11%)	3 (3%)
2 times a week	67 (20%)	17 (15%)	8 (7%)	3 (5%)	15 (17%)	9 (10%)
3 to 5 times a week	3 (1%)	0 (0%)	15 (13%)	7 (13%)	0 (0%)	10 (11%)
6 times a week	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Every day	132 (39%)	57 (49%)	55 (47%)	23 (41%)	40 (45%)	37 (42%)
More than once a day	38 (11%)	15 (13%)	30 (26%)	21 (38%)	12 (14%)	28 (32%)
Duration of reading						
No reading	1 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Fewer than 10 minutes	96 (36%)	37 (42%)	38 (36%)	6 (13%)	26 (38%)	6 (8%)
10–20 minutes	137 (51%)	40 (46%)	61 (57%)	35 (73%)	35 (51%)	57 (74%)
21–40 minutes	25 (9%)	10 (11%)	8 (8%)	7 (15%)	6 (8%)	13 (17%)
More than 40 minutes	10 (4%)	1 (1%)	0 (0%)	0 (0%)	2 (3%)	1 (1%)
Number of books in the home						
None	12 (4%)	1 (1%)	1 (1%)	0 (0%)	0 (0%)	0 (0%)
10–24	61 (18%)	17 (15%)	26 (23%)	0 (0%)	13 (15%)	0 (0%)
25–100	231 (67%)	83 (72%)	70 (60%)	25 (45%)	61 (69%)	47 (53%)
More than 100 books	39 (11%)	15 (13%)	19 (16%)	31 (55%)	11 (12%)	42 (47%)

is read to). The relevant items in the AIHW's (2017) report ($N \sim 800,000$ children) were the frequency of caregivers' shared book reading or storytelling (three or more days in the previous week) and the number of children's books in the home (25–100 books) when children were 0 to 2 years of age.

We then investigated the shared book reading frequency of caregivers over time as a dichotomized outcome (daily [or more] versus less than daily) using unadjusted odds ratios to determine a measure of association between the frequency of shared book reading at baseline with shared book reading at six months and three years along with shared book reading frequency at six months with shared book reading at three years.

Reading attitudes and interactions

Six of the nine items used Likert scales to gather responses from caregivers, two provided simple yes/no options, and one requested a free-text response. The percentage of caregivers who provided each type of ordinal and yes/no response was calculated, and these percentages were compared between baseline and three years (the B + 6 + 36 and B + 36 sample; $N = 89$) and also between baseline, six months, and three years (B + 6 + 36 sample; $N = 56$). For the free-text response item (Benefits of the Program), key words were identified from all caregiver free-text responses to determine themes (e.g., range of books, love of reading). These themes were then tallied to determine the three themes with the highest frequency and proportions reported for the top three themes.

Emerging literacy skills

Of the 89 caregivers who completed surveys at baseline and three years (B + 6 + 36 and B + 36), 64 (72%) had children who had turned three. We used the responses of these caregivers to the 11 items and six summed scores to assess emerging literacy skills. For each item, we calculated the percentage of caregivers who provided ordinal responses of rarely, sometimes, or often. For 10 of these items, we calculated the percentage of caregivers whose ordinal responses were 0, 1, 2, 3, or 4. For the eleventh item, we calculated the percentage of caregivers whose ordinal summed score was 0, 1, or 2.

We conducted three statistical analyses (with $p < .05$) to test if there was an association between ordinal measures of emerging literacy skills and frequency of shared book reading. First, we used non-parametric Mann – Whitney U tests to compare the ordinal responses of two groups of caregivers: those whose children were read to daily (or more) to those whose children were read to less than daily. Second, we investigated unadjusted odds ratios to determine a measure of association between shared book reading frequency (daily [or more] versus less than daily) with the six summed scores for emerging literacy at three years. Third, we calculated Spearman's rank correlations (r) between the ordinal measure of shared book reading frequency (fewer than three days, three to five days, or six or more days) and the summed scores for each variable. Calculation of the confidence intervals for Spearman's rank correlation coefficients applied the Fieller and Pearson (1961) methodology. In line with the recommendations of Gignac and Szodorai (2016), we interpreted r values of 0.10, 0.20, and 0.30 as relatively small, moderate, and large, respectively.

Qualitative analysis

The qualitative analysis for where caregivers were given the option to share any additional feedback about the program or survey applied a deductive approach, working from general to more specific themes, and had two main phases. First, written responses were read carefully and subdivided into categories: shared book reading environment, empowerment/behaviors/family, social, cultural – Indigenous, public library, and general community. In the second phase, the data were compared for a thematic analysis of the codes following the guidelines of Singh et al. (2015). In brief, the lead author copied each response into Microsoft Excel (one row per response) and assigned one category label per response using keywords. An independent research assistant then checked the assignment of responses to categories. De-identified statements are provided from the raw feedback provided by caregivers under five thematic headings.

Results

Quantitative results

The home literacy environment

Frequency of shared book reading. For the sample who completed surveys at baseline and three years ($B + 6 + 36$ and $B + 36$; $N = 89$), the proportion of caregivers reading daily or more to their child increased from 59% at baseline (after receiving one book) to 74% at three years (see Table 2). This is notably higher than data obtained from the LSAC study, which estimated that 58% of children age two to three years ($N = 4,606$) were read to six to seven days per week.

In the Tamworth sample, caregivers who read daily or more at baseline were five times more likely to read daily or more at three years (OR 4.9, 95% CI 1.8,13.7) (see Table 3). Further, 68% of 3-year-old children were read to twice a week or more by other caregivers (usually fathers; see Supplementary Table S2).

Table 3. Unadjusted odds ratios for reading frequency (daily or more vs. less than daily) at baseline, six months, and three years.

Predictor (IV)	Sample	Sample Size	OR (CI)
Predicting daily (or more) reading at 6 months			
Frequency of reading at baseline	$B + 6$	$N = 116$	5.7 (2.3,13.8)
Predicting daily (or more) reading at 3 years			
Frequency of reading at baseline	$B + 36$	$N = 89$	4.9 (1.8,13.7)
Frequency of reading at 6 months	$B + 6 + 36$	$N = 56$	5.9 (1.2,29.0)

For the sample who also completed the survey at six months (B + 6 + 36; $N = 56$), 73% reported daily or more reading at six months. *This is higher than the 60% estimated by the AIHW (2017) report for $N \sim 800,000$ children age 0 to two not on the Imagination Library.*

Caregivers who read daily or more at baseline (B + 6, $N = 116$) were nearly six times more likely to read daily or more at six months (OR 5.7, 95% CI 2.3,13.8) (see Table 3).

Duration of shared book reading. For the sample who did surveys at both baseline and three years (B + 6 + 36 and B + 36; $N = 89$), the median duration of caregiver reading was 10–20 minutes at both baseline and three years, with the proportion of those reading more than 10 minutes increasing from 62% at baseline to 92% at three years.

For the sample ($N = 56$) who also completed a survey at six months (B + 6 + 36), the median duration of caregiver reading was 10–20 minutes at baseline, six months, and three years, with the proportion of those reading more than 10 minutes increasing from 58% at baseline to 65% at six months. *This is notably higher than data obtained from the LSAC study, which estimated 33% of children aged under one year ($N = 5,107$) were read to for more than 10 minutes on average per sitting.*

Number of children's books in the home. For the sample who did surveys at baseline and three years (B + 6 + 36 and B + 36; $N = 89$), 85% of caregivers reported having more than 25 books at baseline, which increased to 100% at three years. For the sample who also completed the survey at six months (B + 6 + 36; $N = 56$), the median number of books in the home was 25–100, with 76% of caregivers reporting they had more than 25 books in the home at six months. *This is much higher than the 44% reported by the AIHW (2017) for $N \sim 800,000$ children age 0 to two not on the Imagination Library.*

Reading attitudes and interactions

The responses of caregivers who did surveys at baseline and three years (B + 6 + 36 and B + 36; $N = 89$; see Supplementary Table S3) indicated that at three years, 75% of children asked to be read to daily, 85% of caregivers felt more connected to the child, and 84% reported spending more quality time together as a family. Nearly all caregivers (96%) thought reading to the child was important, 99% would recommend the program, and 78% found that the tip sheets were useful. At three years, many caregivers were using repeating/rhyming words (62%) and counting images/objects (81%), with nearly half using repeating/teaching letter sounds (47%) and discussing the plot (49%). Nearly all children (91%) had a library card at three years, and 51% had visited the library in the last six months with the caregiver and 19% with another family member. At three years, 50% of caregivers reported that the greatest benefit of the program was that their child had developed a love of books/reading, 33% reported the opportunity to learn from the books, and 11% reported the range of books being provided.

For the sample who also did the survey at six months (B + 6 + 36; $N = 56$), the proportion of children who asked the caregiver to be read to daily increased from 16% at six months to 77% at three years (see Supplementary Table S3). The proportion of caregivers who felt more connected to the child and reported spending more quality time together as a family remained constant (79%–82% and 82%–84%, respectively). At six months, 83% of caregivers thought reading to the child was important, which increased to 100% at three years. The proportion of caregivers who would recommend the program at both six months (98%) and three years (100%) remained constant, as did the proportion of those who found the tip sheets useful (76% at six months and 79% at three years). With respect to the reading techniques, the proportion of caregivers reporting using these increased between six months and three years: repeating/teaching rhyming words (53%–68%), repeating/teaching letter sounds (35%–45%), counting images/objects (72%–79%), and discussing the plot (16%–50%). For the sample who also did the survey at six months (B + 6 + 36; $N = 56$) and at three years, 42% of caregivers reported that the greatest benefit of the program was that their child had developed a love of books/reading, 31% reported the opportunity to learn from the books, and 20% reported the range of books being provided.

Emerging literacy skills

Concepts about print. At three years, many caregivers reported that their child often held books correctly (84%) or pretended to read by pointing to words (58%) (see Table 4). Mann – Whitney U tests indicated a statistically significant difference between daily (or more) reading and less than daily reading for holding books correctly ($p = .004$) but not pretending to read ($p = .227$). For the summed score across both items, the graphical representation (see Figure 3) shows a higher percentage for children read to daily or more (61%) than read to less than daily (33%). Unadjusted odds ratios demonstrated no significant association between the summed score and the frequency of reading dichotomized (daily [or more] versus less than daily). However, Spearman's rank correlations demonstrated a moderate association between the frequency of reading (ordinal: fewer than three days, three to five days, or six or more days) and concepts about print (0.264; 95% CI 0.13,0.485, $p = .035$); that is, more shared book reading was associated with more familiarity with print materials.

Alphabet knowledge. Approximately two-thirds of caregivers indicated that their child sometimes (34%) or often (30%) named letters, while one-third reported that their child rarely demonstrated this skill (36%) (see Table 4). Almost one-half of caregivers (47%) indicated that their child made the sounds of letters, while one-half (53%) responded that their child rarely did. There was a statistically significant difference between daily (or more) reading and less than daily reading for naming the letters ($p = .027$) but not for the child making the sounds of the letters ($p = .406$). For the summed score across both items, the graphical representation (see Figure 3) shows similar percentages for children read to daily or more (12%) and less than daily (13%). Unadjusted odds ratios demonstrated no significant link between the summed score for concepts about print and the frequency of reading (daily [or more] versus less than daily). Spearman's rank correlations demonstrated a significant moderate relationship between the frequency of reading (ordinal: fewer than three days, three to five days, or six or more days) and concepts about print (0.223; 95% CI $-0.032, 0.450$, $p = .077$); that is, more shared book reading was somewhat associated with more familiarity with alphabet knowledge.

Receptive vocabulary. Most caregivers reported that their child often answered questions like who, what, where, and why (53%) or the child could follow directions including two or more steps (64%) (see Table 4). There was a statistically significant difference between daily (or more) reading and less than daily reading for answering questions ($p = .039$) but not for following directions ($p = .152$). For the summed score across both items, the graphical representation (see Figure 3) shows a higher percentage for children read to daily or more (43%) than read to less than daily (33%). Unadjusted odds ratios demonstrated no significant association between the summed score and the frequency of reading dichotomized (daily [or more] versus less than daily). However, Spearman's rank correlations demonstrated a moderate relationship between the frequency of reading (ordinal: fewer than three days, three to five days, or six or more days) and receptive vocabulary (0.225; 95% CI $-0.029, 0.452$, $p = .073$); that is, more shared book reading was associated with more receptive vocabulary.

Expressive vocabulary. The majority of caregivers reported that their child could retell the sequence of events in a story (63%), or the child could connect two sentences using the word "and" (64%) (see Table 4). There was a statistically significant difference between daily (or more) reading and less than daily reading for retelling the sequence ($p = .012$) but not for connecting two sentences ($p = .093$). For the summed score across both items, the graphical representation (see Figure 3) shows a higher percentage for children read to daily or more (63%) than read to less than daily (33%). Unadjusted odds ratios demonstrated a significant association between the summed score and the frequency of reading dichotomized (daily [or more] versus less than daily) (OR 3.4, 95% CI 1.1,11.7). Spearman's rank correlations demonstrated a moderate association between the frequency of reading (ordinal: fewer than three days, three to five days, or six or more days) and expressive vocabulary (0.288; 95%

Table 4. Mann-Whitney U test and unadjusted odds ratios for children's emerging literacy skills ordinal and dichotomized and frequency of reading dichotomized and ordinal at age three.

	Rarely N (%)	Sometimes N (%)	Often N (%)	Daily (N = 49) and < daily reading (N = 15)		Ordinal reading (N = 64)
				Mann- Whitney	OR (95% CI)	r (95% CI) p value
N = 64 (over 3 years old) Emerging literacy skills sample						
My child holds books the correct way up and turns pages for reading	2 (3%)	8 (13%)	54 (84%)	$p = 0.004$	–	
My child pretends to read by pointing to words or moving their finger left to right across the writing	10 (16%)	17 (27%)	37 (58%)	$p = 0.227$	–	
Concepts about print (Sum of the above two questions)				$p = 0.036$		0.264 (0.13,0.485) $p = 0.035$
Concepts about print (Often in both questions)			35 (55%)		3.2 (0.9,10.7)	
My child can name letters that you point to	23 (36%)	22 (34%)	19 (30%)	$p = 0.027$	–	
My child can make the sounds of the letters you point to	34 (53%)	19 (30%)	11 (17%)	$p = 0.406$	–	
Alphabet knowledge (Sum of the above two questions)				$p = 0.077$		0.223 (–0.032,0.450) $p = 0.077$
Alphabet knowledge (Often in both questions)			8 (13%)		0.9 (0.2,5.0)	
My child answers questions like who, what, when, where, and why?	5 (8%)	25 (39%)	34 (53%)	$p = 0.039$	–	
My child can follow directions that include two or more steps	6 (9%)	17 (27%)	41 (64%)	$p = 0.152$	–	
Receptive vocabulary and language (Sum of the above two questions)				$p = 0.073$		0.225 (–0.029,0.452) $p = 0.073$
Receptive vocabulary and language (Often in both questions)			26 (41%)		1.5 (0.4,5.0)	
My child can retell the sequence of events in a story or an activity (e.g., making something)	7 (11%)	17 (27%)	40 (63%)	$p = 0.012$	–	
My child can connect two sentences using the word “and”	7 (11%)	16 (25%)	41 (64%)	$p = 0.093$	–	
Expressive vocabulary and language (Sum of the above two questions)				$p = 0.022$		0.288 (0.038,0.504) $p = 0.021$
Expressive vocabulary and language (Often in both questions)			36 (56%)		3.4 (1.1,11.7)	
My child can rhyme (e.g., If I ask them what rhymes with “bed,” they would say red, head, said, etc.)	30 (47%)	26 (41%)	8 (13%)	$p = 0.223$	–	
My child can name words beginning with a certain sound (e.g., If I ask them what starts with “buh,” they would say bed, bath, ball, etc.).	28 (44%)	25 (39%)	11 (17%)	$p = 0.706$	–	
Phonological awareness (Sum of the above two questions)				$p = 0.358$		0.116 (–0.141,0.358) $p = 0.137$
Phonological awareness (Often in both questions)			6 (9%)		1.6 (0.2,14.8)	
My child can repeat new words that they hear	3 (5%)	14 (22%)	47 (73%)	$p = 0.136$	–	
Phonological memory (As above)				$p = 0.136$		0.188 (–0.680,0.421) $p = 0.137$
Phonological memory (Often in the question)			47 (73%)		2.3 (0.7,7.9)	

Ordinal reading fewer than 3 days, 3–5 days, 6 or more days.

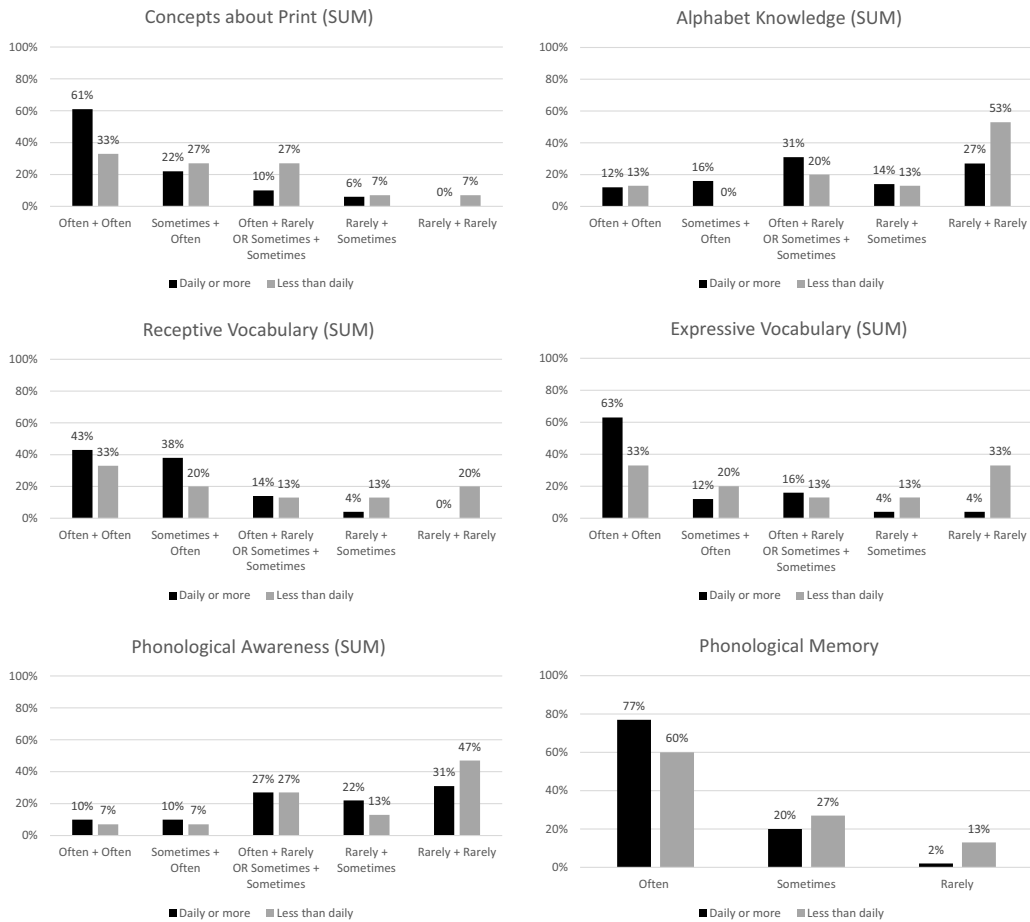


Figure 3. Proportion of responses for the summative emerging literacy skills at three years comparing daily or more reading ($N = 49$) vs. less than daily reading ($N = 15$) at three years for those children over three years ($N = 64/89$, 72%).

CI 0.038,0.504, $p = .021$); that is, more shared book reading was moderately associated with more expressive vocabulary.

Phonological awareness. Nearly all caregivers indicated that their child sometimes (41%) or rarely (47%) could rhyme, which was similar for the child naming words beginning with a certain sound (sometimes 39% or rarely 44%) (see Table 4). There was no statistically significant difference between daily (or more) reading and less than daily reading and rhyming ($p = .223$) or for the child naming words

($p = .706$). For the summed score across both items, the graphical representation (see Figure 3) shows similar percentages for children read to daily or more (10%) and less than daily (7%). Unadjusted odds ratios demonstrated no significant association between the summed score for phonological awareness and the frequency of reading (daily [or more] versus less than daily). However, Spearman's rank correlations demonstrated a weak and non-significant relationship between the frequency of reading (ordinal: fewer than three days, three to five days, or six or more days) and phonological awareness (0.116; 95% CI $-0.141, 0.351$, $p = .137$).

Phonological memory. Most caregivers reported that their child could repeat new words they hear (73%) (see Table 4). There was no statistically significant difference between daily (or more) reading

and less than daily reading for repeating new words ($p = .136$). The single-question graphical representation

(see [Figure 3](#)) shows a higher percentage for children read to daily or more (77%) than read to less than daily (60%). Unadjusted odds ratios demonstrated no significant association between the single question for phonological memory and the frequency of reading dichotomized (daily [or more] versus less than daily). Spearman's rank correlations demonstrated a weak and non-significant association between the frequency of reading (ordinal: fewer than three days, three to five days, or six or more days) and phonological memory (0.188; 95% CI $-0.680, 0.421$, $p = .137$); that is, more shared book reading was slightly associated with more phonological memory.

Qualitative results

Qualitative feedback was provided from 43/89 (48%) of caregivers at three years.

Shared book reading environment

Many caregivers commented on the importance of the book arrivals from the child's perspective (e.g., "Dolly sent me another book"), and many families highlighted the routine that went with the monthly arrival, especially the day the post person arrives with the book (e.g., "Just take those few minutes when the child asks to be read to" as the child receives "something of joy directly for them"). Families also highlighted that the monthly books established "the child's own library before school" and ensured "there are no excuses in terms of accessing quality literature on the program." Some caregivers commented on the usefulness of the tip sheets (e.g., "I didn't know where to start with the books and the tip sheets would always give me confidence," "Leaving the tip sheets on the fridge were another gentle reminder," "The tip sheets provided a rough ballpark of steps for me and as a new mum that really helped").

Empowerment/behaviors/family

A second key theme coming through the feedback focused on the empowerment that caregivers felt from participation in the program: "My town values my son and his future. They will financially support this to say, 'Hey, your baby matters and will in the future'" and "An adult in Tamworth thinks it is important enough to send a book to my child and somebody sends that book for free." Multiple caregivers reported that "spending money on books was not an option" or "If we had any money left over, we would not have spent it on books – it would have been on extra baby formula." There were numerous comments relating to the age at which shared book reading could be started (e.g., "I never knew reading to babies was 'a thing.'") and how it might help communication with a baby (e.g., "having a baby who can't speak back and I don't know what to say, reading a book to her is great," "My child's dad doesn't know what to do with the baby but by getting the book it gives him the opportunity to read to her;" and "My partner's interest in reading to our bub, his reading skills and relationship with bub has improved dramatically through reading to our bub"). Finally, the impact of the program on siblings and grandparents/other caregivers was noted: "We open it as a family, I read the tip sheet first to help guide me, and then we all sit and read it together and go straight on to the additional tips;" "I read it to my six-year-old and we discuss the book and then she reads to my eight-month-old. It's beautiful to see them interact;" and "I wait for my oldest son to come home from school, and we read the book all together." Of the 89 households from which the caregivers completed the surveys, a further 90 siblings were also in the household but not enrolled in the program, therefore extending the reach of the books ($(90 + 129)/129 = 170\%$ reach).

Social

Two "social" themes emerged, the first being the social connection of the children to each other. Feedback highlighted interactions between the children around familiar books and characters within the books in the playground, social play gatherings, along with preschools (e.g., "Because the children

all have access to the Dolly Parton books . . . by every child getting the program . . . they are all familiar with the characters in the books, which gives the children a connection”). The second social theme related to the socio-economic nature of Tamworth. The “universal approach was not done by social standing . . . creates an equal playing field . . . [with] all kids equally important;” “kids with the best start possible irrespective of their situation;” and “the common reading the children are getting will bring a social benefit and they will know more about life.”

Cultural – Indigenous

Feedback provided by Aboriginal and Torres Strait Islander caregivers demonstrated the inter-generational impact of the program, with families saying “uncles . . . grandfathers were excited for the children to be getting the books because they never had access to books and now, they are all reading together.” In other cases, Indigenous families reported how their children were able to identify with the characters in some of the books: “My kids couldn’t believe that kids of their color could fly a plane, they really looked into it a lot deeper.” This was identified as being important by one grandparent/teacher, who stated that “it is important for a child to be able to link to their own lives, if the story is something they can relate to and that is available through the program as a lot of the stories are Indigenous.”

Library and community

The library in Tamworth provides a central hub where families can go to for support: “You can just walk into the library and so much is happening, Baby Book Time, story time, toddler time . . . adult literacy classes . . . gives another space for social interaction brought together by the program.” Comments about challenges with shared booked reading (e.g., “I don’t really know how to read these books” or “I struggled at school, my mum struggled”) also highlighted the contribution of libraries, such as “The library has helped me so much and I am feeling more confident to read the books after watching the library lady read the program books out loud in the library.” One caregiver stated that “this program not only helps our children’s literacy but our own as well.”

Community connectedness also emerged from the qualitative analysis: “The Imagination Library is about strengthening our community and forging a generation of early childhood literacy at the forefront;” “it is a fantastic resource for our community” and “an asset to the community.” Caregivers responded with feedback about the connection the program provided during COVID-19: “The books replaced the day care, and we would watch the Facebook posts on how to read the books from the preschool to help us.” This was also the case for rural/remote communities: “There are so many places without internet out here so having physical books is really important and they just turn up in the mail.”

Concerns and criticism

Although most feedback about the program and surveys was positive (55/59, 93%), there were four issues raised by caregivers. The first two issues related to the logistics of book delivery. First, at both six months and three years, some caregivers reported that the books did not always arrive at the same time for all the children or consistently at the beginning of each month. Second, it was noted that some books were arriving bent in the mailbox. Third, while the inclusion of Aboriginal and Torres Strait Islander books was appreciated, it was noted that including books from all over the world would help broaden the learning for the children. One final criticism was expressed in the disappointment of one caregiver that their child would no longer receive the books because they had to move from the region.

Discussion

This study investigated the association between Dolly Parton’s Imagination Library and the home literacy environment, reading attitudes and interactions, and children’s emerging literacy skills. To this end, we analyzed the survey responses of 343 caregivers in Tamworth who were enrolled in the

Imagination Library in 2019 and completed surveys after receiving one book (baseline) and then at six months and/or three years (36 months). Below we use the results of both quantitative and qualitative analyses to address each of the study aims in turn.

Home literacy environment

Regarding the frequency of shared book reading, our findings indicated that the proportion of caregivers reading daily increased from 59% at baseline to 74% at three years and that those reading to the child more than once a day tripled from baseline to three years (14% to 42% respectively). These percentages are higher than those reported by the large-scale LSAC database. Further, they are similar in size, if not larger, than those reported by previous studies of the Imagination Library (Bradley et al., 2001; Harvey, 2016; Ridzi et al., 2014). The results from this study indicate that engagement in the Imagination Library is associated with increased frequency of shared book reading.

Another finding from this study was that caregivers reading daily or more to their child at baseline were five times more likely to be reading daily or more at six months and at three years. In our study, 76% of caregivers were reading twice a week or more from birth, which suggests that early reading routines were sustained through to three years. This is a key finding since Theriot et al. (2003) outlined that the early onset of routine reading practices has been associated with receptive and expressive language skills in toddlers, and also verbal performance and higher reading scores in the primary years.

Our finding that nearly 70% of fathers were reading more than twice a week to their child at three years was an interesting outcome given that previous research by Duursma et al. (2008) found less than half of fathers read to their children regularly. This is an encouraging result because fathers' use of language is different from mothers' (Duursma et al., 2008; Paulson et al., 2009) and has been found to be predictive of children's expressive language at three years (Paulson et al., 2009).

With respect to the duration of shared book reading, our finding that 65% of children at six months were read to for more than 10 minutes a day was encouraging, especially when compared to the LSAC study, in which only 33% of children under one year old ($N = 5,000$ approximately) were read to for more than 10 minutes a day. This finding indicates that participation in the Imagination Library is associated with caregivers spending more time reading to their children than is typically the case for Australian caregivers.

In terms of the number of children's books in the home, given the frequent delivery of books by the Imagination Library (12 books per year), our finding that 76% of children had at least 25 books in the home by six months was not unexpected. This percentage is notably higher than the AIHW (2017) estimate that 44% of children in Australia aged birth to two years have at least 25 books in the home (more specifically, 25–100). This is a key finding given that the number of children's books in the home has been associated with children's later language and literacy abilities (Baker, 2014; Chen & Ren, 2019; de Bondt et al., 2020; Funge et al., 2017).

For the home literacy environment, findings from our study suggest that children in the Imagination Library in Tamworth were read to more frequently, for longer durations, and had more books in their home than the average Australian child, as represented by data provided by large Australian Government surveys.

Reading attitudes and interactions

Given that the fundamental goal of the Imagination Library is to develop a love of reading in children, a key finding of this study is that caregivers reported that more than 75% of children were interested in books and reading at three years. This is an important finding given that studies have found that children who are interested in books are more likely to ask to be read to, explore books on their own, and self-direct their reading and learning (DeBaryshe, 1995), and that the latter is, in turn, associated with lower incidence of placement in special education and higher rates of school completion (Reschly, 2010).

Our finding that, after three years of participation, 96% of caregivers would recommend the program was a strong indicator of satisfaction with the books and administration of the Imagination Library program in Tamworth. Further, three out of four caregivers reported that they found the tip sheets useful. Such resources are particularly useful for caregivers with low reading proficiency (Newman, 1996), which can affect the nature of the shared book reading (Aram et al., 2013). They are also useful for families located on rural properties – such as those in the Tamworth region – where access to books and supporting information for caregivers is limited, and reading practices are typically limited to the home (Zgourou et al., 2021).

Finally, it was encouraging to see that the percentage of caregivers who used all the suggested reading techniques increased by an average of 17% from six months to three years since previous studies had found that caregiver engagement (i.e., caregiver asking questions) during shared book reading enhances the development of emerging literacy skills above and beyond reading without extra interaction between the caregiver and child (DesJardin et al., 2017; Landry et al., 2012; Li et al., 2021; Schmitt et al., 2011).

In summary, the positive attitudes reported by caregivers and the high proportion of children interested in reading suggest that the Imagination Library promotes shared book reading as an important contributor to caregivers' beliefs in the importance of regular reading to the child and, thus, the child developing a love of books.

Children's emerging literacy skills

Regarding concepts about print (“My child holds books the correct way up and turns pages for reading,” “My child pretends to read by pointing to words, or moving their finger left to right across the writing”), caregivers reported that most children (84%) could hold the book the correct way and children who experienced a higher frequency of shared book reading (daily or more) at three years held the book correctly significantly more often than those who were read to less frequently (less than daily). In contrast, just over half (58%) of the children pretended to read, but there was no difference between those children who experienced a higher frequency of shared book reading (daily or more) and those who experienced a lower frequency of shared book reading (less than daily). For the summed score for concepts about print, over half the children (55%) in the Imagination Library program often demonstrated this skill, and children who experienced a higher frequency of shared book reading (daily or more) at three years demonstrated this skill significantly more often than those who were read to less frequently (less than daily) ($p = .036$). This was supported by the finding that there was a moderate and significant association ($r = 0.264$, $p = .035$) between increasing levels of shared book reading frequency (fewer than three days, three to five days, or six or more days) and summed score for reading concepts about print. Together, these findings suggest that higher frequency of shared book reading in the Imagination Library is associated with improved development of concepts about print in young children. Our findings align with those of Anderson et al. (2019), who also found a moderate and significant association between increases in the frequency of shared book reading and concepts about print ($r = 0.242$, $p < .05$) in 152 children in the USA who were in the Imagination Library program.

With respect to alphabet knowledge (“My child can name letters that you point to,” “My child can make the sounds of the letters you point to”), caregiver reports indicated that most children (64%) could name letters sometimes or often, and children who experienced a higher frequency of shared book reading (daily or more) at three years named letters significantly more often than those who were read to less frequently (less than daily; $p = .027$). In contrast, just less than half (47%) of the children could make the sounds of the letters sometimes or often, and there was no difference between those children who experienced a higher frequency of shared book reading (daily or more) and those who experienced a lower frequency of shared book reading (less than daily). Given that the two items assessing alphabet knowledge produced different results, it was unsurprising that the moderate relationship between the summed score for alphabet knowledge and levels of shared book reading frequency (fewer than three days, three to five days, or six or more days) was non-significant

($r = 0.223$, $p = .077$). Therefore, the results of this study suggest that shared book reading is associated with the development of knowledge of letter names in 3-year-old children, but not letter sounds. This is appropriate given that older children (i.e., five to six years) typically require explicit and repetitive instruction to master letter-sound knowledge. To our knowledge, this is the first study to analyze caregiver reports on letter naming and letter-sound knowledge in children in the Imagination Library, and hence we cannot compare this finding to previous work to ascertain its reliability.

In terms of receptive vocabulary (“My child answers questions like who, what, when, where, and why?”; “My child can follow directions that include two or more steps”), caregivers reported that over half of the children (53%) could often answer who-what-when questions, and children who experienced a higher frequency of shared book reading (daily or more) at three years could answer such questions significantly more often than those who were read to less frequently (less than daily) ($p = .039$). In addition, caregivers reported that the majority of children (64%) could follow directions, although there was no significant difference between children who experienced a higher frequency of shared book reading (daily or more) and those who experienced a lower frequency of shared book reading (less than daily). The fact that shared book reading is more likely to prompt who-what-when questions by caregivers than instructions to follow complex directions may provide a clue for the pattern of outcomes across all the emerging literacy variables, as discussed in the final paragraph of this section. The summed score indicated that many children did not often demonstrate this emerging literacy skill (41%), and there was a moderate but non-significant association ($r = 0.225$, $p = .073$) between the summed score and increasing levels of shared book reading frequency (fewer than three days, three to five days, or six or more days).

For expressive vocabulary (“My child can retell the sequence of events in a story or an activity (e.g., making something);” “My child can connect two sentences using the word ‘and’”), caregivers reported that most children (63%) could retell the sequence of events and children who experienced a higher frequency of shared book reading (daily or more) at three years could retell the sequence of events correctly significantly more often than those who were read to less frequently (less than daily). A similar proportion of caregivers reported that children could connect two sentences (64%); however, there was no significant difference between children who experienced a higher frequency of shared book reading (daily or more) at three years connecting sentences correctly more often than those who were read to less frequently (less than daily). Our analysis estimated that over half the children (56%) in the Imagination Library program often demonstrated expressive vocabulary, as represented by the summed score across two items. Children who experienced a higher frequency of shared book reading (daily or more) at three years demonstrated this skill significantly more often than those who were read to less frequently (less than daily) ($p = .022$). This was supported by the finding that children who were read to daily (or more) were three times more likely to demonstrate the skill than those who were read to less frequently and that there was a moderate relationship ($r = 0.288$, $p = .021$) between increasing levels of shared book reading frequency (fewer than three days, three to five days, or six or more days) and frequency of expressive vocabulary skill. Together, these findings suggest more frequent shared book reading is associated with more developed expressive vocabulary in young children. This is the first study, to our knowledge, to address the association between shared book reading and expressive vocabulary in children in the Imagination Library; hence, we cannot compare our findings to previous work.

In relation to phonological awareness (“My child can rhyme [e.g., If I ask them what rhymes with ‘bed,’ they would say red, head, said, etc.];” “My child can name words beginning with a certain sound [e.g., If I ask them what starts with ‘b’ they would say bed, bath, ball, etc.]”), just over half the children (54%) were reported to rhyme sometimes or often and could name words beginning with a certain sound (56%). However, there was no difference between children who were read to at least once per day compared to those read to less than once per day for either of these items. It is interesting to note that these results are similar to those for letter-sound knowledge since these two variables are closely related in children in the early school years. Considering the summed score for phonological awareness at three years, the vast majority of children did not often demonstrate this skill (91%), there

was no significant difference between children who were read to at least once per day compared to less than once a day ($p = .358$), and there was a weak and non-significant relationship ($r = 0.116$, $p = .137$) between increasing levels of shared book reading frequency (fewer than three days, three to five days, or six or more days).

Finally, phonological memory was assessed using a single item (“My child can repeat new words that they hear”). Our study indicated that 73% of children often demonstrated this skill. However, at three years, there was no difference between children who experienced relatively higher (daily or more) and lower (less than daily) frequency of shared book reading for reported phonological memory ($p = .136$). In line with this, there was a weak and non-significant relationship ($r = 0.188$, $p = .137$) between increasing levels of shared book reading frequency (fewer than three days, three to five days, or six or more days) and caregiver reports of children’s phonological memory. Again, this is the first study, to our knowledge, to test this in children who are in the Imagination Library program; hence, we cannot compare our findings to previous work.

In summary, our findings suggest that the Imagination Library is associated with reports of more advanced emerging literacy skills in 3-year-old children – specifically, concepts about print (summed score), knowledge of letter names, who-what-when questions (receptive vocabulary), and expressive vocabulary (summed score). This was not the case for letter-sound knowledge, phonological awareness (summed score), following instructions (receptive vocabulary), or phonological memory (repeating new words). This pattern of findings could be explained by proximal versus distal training effects. More specifically, there is good evidence from reading-intervention research that reading-related skills trained directly (proximal effects) will show greater gains than reading-related skills not trained directly (distal effects; e.g., McArthur & Castles, 2017). The emerging literacy skills in this study that were associated with the frequency of shared book reading were those most likely to be directly “trained” (i.e., encouraged or modeled) by caregivers to their 3-year-olds during shared book reading (e.g., holding books the correct way up, using a finger to track words on a page, naming letters, asking who-what-why-questions, and getting children to retell stories). Those not associated with shared book reading were less likely to be directly trained by caregivers during shared book reading (letter-sound knowledge, phonological awareness, or following complex instructions). The exception to this interpretation is repeating new words, which one might expect would be directly trained during shared book reading. However, this skill is mastered by children by three years, as illustrated by the fact that 74% of children were reported to engage in this skill “often;” thus, this measure may not have been a sensitive metric for children at age three.

Qualitative findings

Our analysis of the qualitative data (where caregivers were given the option to provide feedback about the program or the survey) identified five categories of feedback. The first was shared book reading. Parents in the Tamworth program repeatedly commented that the books and tip sheets provided regular reminders to engage in reading, which is consistent with Neyer et al. (2021), who found that the monthly deliveries of Imagination Library books helped to maintain consistency. The increased frequency of shared book reading from baseline (59%) to three years (74%) might have occurred because the monthly arrival of books makes caregivers more aware that they should be reading to their child rather than directly increasing the frequency of reading (Ridzi et al., 2014).

The second category was empowerment/behaviors/family. Some families in Tamworth noted that buying books was not a priority over other necessities, such as baby formula. Feedback from some families in Tamworth that they would not have had the money to purchase books demonstrates how the Imagination Library eliminates any financial barriers families face in acquiring books by adopting a universal approach where all children receive the books irrespective of their socio-economic status or geographic location. This is important, as evident in the literature by Taylor et al. (2016), who outlined the need to address barriers that might stop parents from reading to their children, such as access to books, and that taking these steps reduces disparities in resources known to impact healthy development (Flores et al., 2005). There is increasing evidence in the literature that demonstrates investing in early childhood interventions such as shared book reading could be one of the most economically sound investments

that a community like Tamworth could make (Skibbe & Foster, 2019) and warrants further research. Feedback from some caregivers that they were not aware that one could read to a baby was interesting and supported by our quantitative finding that at baseline, 16% of caregivers were not reading to the child because they did not think it was applicable. This is similar to Jain et al. (2021), who observed that not all caregivers are aware that reading to a baby is important. In this study, 98% of caregivers were reading to the child by six months. The qualitative feedback provided by caregivers indicated that they believed that the Imagination Library encouraged them to undertake shared book reading with their newborns.

The third area of social feedback focused on the fact that every child in Tamworth was enrolled in the program and received the same age-appropriate books irrespective of the family's socio-economic situation, which provided equality across the community. Given that reading failure is more prominent in children from lower socio-economic backgrounds (Goldfeld et al., 2011) and, conversely, caregivers with socio-economic advantage demonstrated less frequent shared book reading (Huebner, 2000), it is important to provide books using the universal approach undertaken in Tamworth.

The fourth area of qualitative feedback was focused on the impact on the Indigenous community of Tamworth, who represent approximately 13% of the population. Approximately 10% of books in the Imagination Library in Australia are written or illustrated by Indigenous people. This allows Indigenous children to be able to link their own lives to the stories, which was evident in the qualitative analysis. Intergenerational impact was also reported in the qualitative analysis, where families commented on elderly people in the family appreciating the gift of books (something they did not have) and reading with the younger children.

The final area of feedback relating to the Tamworth City Library and community provided interesting findings, especially when caregivers outlined how the library had impacted their own literacy skills, which is vital given that literature has outlined how caregivers with low-levels of literacy have been found to read to their children less than caregivers with higher levels of literacy, have limited knowledge about early childhood literacy development, and negative beliefs about literacy (Mendelsohn et al., 2001).

In summary, the qualitative feedback received demonstrated positive impacts on the family and greater community that cannot always be quantified. However, exploring these wider benefits of the program in Tamworth suggests that the impact of the Imagination Library goes beyond enhancing the home literacy environment and developing emerging literacy skills.

Limitations

The results of this study need to be interpreted with three methodological limitations in mind. Firstly, self-report questionnaires are vulnerable to "social desirability bias," which occurs when caregivers answer questions in a way that they believe would appear favorable to the researchers (Tura et al., 2023). For example, caregivers may be more likely to report a higher frequency of shared book reading, and more emerging literacy skills, than may have occurred. However, Grimm (2011) outlines that collecting data through a survey, rather than face-to-face interviews, can reduce social desirability bias, as caregivers are less likely to try and "please" the interviewer.

The second limitation is that self-report measures of shared book reading may themselves be biased (DesJardin et al., 2017). For example, caregivers may "inflate" reports of reading frequency and other home literacy factors because they believe these are important for their child. An alternative method would be to use direct observation of shared book reading behavior in the home (Bus et al., 1995). However, this is impractical for studies that are carried out across large regions such as Tamworth, which is approximately 1 million hectares. This is one of the main reasons large studies of shared book reading use self-report questionnaires.

Finally, it is important to note that this study of the Imagination Library was a correlational study. Correlation data cannot be used to prove causation. It is therefore important to emphasize that any evidence for improved outcomes in the home literacy environment, reading attitudes and interactions, and emerging literacy skills found by this study are associated with participation in the Imagination Library rather than necessarily caused by it.

Summary and conclusions

The survey responses of caregivers of Tamworth children in the Imagination Library program suggest that their children were read to more frequently, for longer periods, and had access to more children's books than the average Australian child. Further, caregivers who read to the child at least once a day at baseline were nearly five times as likely to read to their child daily six months later and three years later, demonstrating the establishment of early reading routines sustained as the child grows. Caregivers' attitudes to, and interactions during, shared book reading were positive at the start of the program and improved further across three years. There was evidence for an association between participation in the Imagination Library and several emerging literacy skills, particularly those most likely to be directly encouraged by caregivers during shared book reading. Together, these results encourage further survey studies of the Imagination Library with even larger samples of children and their caregivers to test the reliability of findings to date. Experimental studies could test the validity of survey studies by employing objective measures of the same variables. Based on the current findings, we predict that such studies will support the regular provision of books to children from their birth until they start school through programs such as Dolly Parton's Imagination Library, which may help enhance the home literacy environment, attitudes toward reading, and children's emerging literacy skills.

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References

- Anderson, K. L., Atkinson, T. S., Swaggerty, E. A., & O'Brien, K. (2019). Examining relationships between home-based shared book reading practices and children's language/literacy skills at kindergarten entry. *Early Child Development and Care*, 189(13), 2167–2182. <https://doi.org/10.1080/03004430.2018.1443921>
- Aram, D., Fine, Y., & Ziv, M. (2013). Enhancing parent-child shared book reading interactions: Promoting references to the book's plot and socio-cognitive themes. *Early Childhood Research Quarterly*, 28(1), 111–122. <https://doi.org/10.1016/j.ecresq.2012.03.005>
- Attig, M., & Weinert, S. (2020). What impacts early language skills? Effects of social disparities and different process characteristics of the home learning environment in the first 2 years. *Frontiers in Psychology*, 11, 557751. <https://doi.org/10.3389/fpsyg.2020.557751>
- Australia Early Development Census. (2018). *Australian early development census*. <https://www.education.gov.au/child-care-package/early-childhood-data-and-reports/australian-early-development-census-aedc>
- Australian Bureau of Statistics. (2016). *Ausstats*. Retrieved October 7, 2023, from <https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/2033.0.55.001~2016~Main%20Features~IRSD%20Interactive%20Map~15>

- Australian Bureau of Statistics. (2021). *Census QuickStats*. Retrieved October 7, 2023, from <https://www.abs.gov.au/census/find-census-data/quickstats/2021/SAL13762>
- Australian Government Department of Social Services. (2022). *Growing up in Australia: The Longitudinal Study of Australian Children (LSAC)*. <https://www.dss.gov.au/about-the-department/longitudinal-studies/growing-up-in-australia-lsac-longitudinal-study-of-australian-children-overview>
- Australian Institute of Health and Welfare. (2017). *Australia's Children*. <https://www.aihw.gov.au/reports/children-youth/australias-children/contents/health/the-health-of-australias-children>
- Baillet, L. L., Zettler-Greeley, C., & Lewis, K. (2018). Psychometric profile of an experimental emergent literacy screener for preschoolers. *School Psychology Quarterly*, 33(1), 120–136. <https://doi.org/10.1037/spq0000222>
- Baker, C. E. (2014). African American fathers' contributions to children's early academic achievement: Evidence from two-parent families from the early childhood longitudinal study-birth cohort. *Early Education and Development*, 25(1), 19–35. <https://doi.org/10.1080/10409289.2013.764225>
- Bradley, R. H., Corwyn, R. F., McAdoo, H. P., & García Coll, C. (2001). The home environments of children in the United States part I: Variations by age, ethnicity, and poverty status. *Child Development*, 72(6), 1844–1867. <https://doi.org/10.1111/1467-8624.t01-1-00382>
- Bus, A. G., van IJzendoorn, M. H., & Pellegrini, A. D. (1995). Joint book reading makes for success in learning to read: A meta-analysis on intergenerational transmission of literacy. *Review of Educational Research*, 65(1), 1–21. <https://doi.org/10.3102/00346543065001001>
- Celano, M., Hazzard, A., McFadden Garden, T., & Swaby-Ellis, D. (1998). Promoting emergent literacy in a pediatric clinic: Predictors of parent-child reading. *Children's Health Care*, 27(3), 171–183. https://doi.org/10.1207/s15326888chc2703_3
- Chen, J. J., & Ren, Y. (2019). Relationships between home-related factors and bilingual abilities: A study of Chinese–English dual language learners from immigrant, low-income backgrounds. *Early Childhood Education Journal*, 47(4), 381–393. <https://doi.org/10.1007/s10643-019-00941-9>
- Conyers, J. (2012). My very own imagination library. *Childhood Education*, 88(4), 221–225. <https://doi.org/10.1080/00094056.2012.699850>
- Crosh, C. C., Barsella, A., Van Slambrouck, L., Notario, P. M., Li, Y., Parsons, A. A., & Hutton, J. S. (2022). Exploratory mixed-methods study of a primary care-based intervention promoting shared reading during infancy. *Clinical Pediatrics*, 61(7), 475–484. <https://doi.org/10.1177/00099228221085825>
- de Bondt, M., & Bus, A. G. (2022). Tracking the long-term effects of the BookStart intervention: Associations with temperament and book-reading habits. *Learning and Individual Differences*, 98, 102199. <https://doi.org/10.1016/j.lindif.2022.102199>
- de Bondt, M., Willenberg, I. A., & Bus, A. G. (2020). Do book giveaway programs promote the home literacy environment and children's literacy-related behavior and skills? *Review of Educational Research*, 90(3), 349–375. <https://doi.org/10.3102/0034654320922140>
- Debaryshe, B. D. (1993). Joint picture-book reading correlates of early oral language skill. *Journal of Child Language*, 20(2), 455–461. <https://doi.org/10.1017/S0305000900008370>
- DeBaryshe, B. D. (1995). Maternal belief systems: Linchpin in the home reading process. *Journal of Applied Developmental Psychology*, 16(1), 1–20. [https://doi.org/10.1016/0193-3973\(95\)90013-6](https://doi.org/10.1016/0193-3973(95)90013-6)
- Deckner, D. F., Adamson, L. B., & Bakeman, R. (2006). Child and maternal contributions to shared reading: Effects on language and literacy development. *Journal of Applied Developmental Psychology*, 27(1), 31–41. <https://doi.org/10.1016/j.appdev.2005.12.001>
- DesJardin, J. L., Stika, C. J., Eisenberg, L. S., Johnson, K. C., Hammes Ganguly, D. M., Henning, S. C., & Colson, B. G. (2017). A longitudinal investigation of the home literacy environment and shared book reading in young children with hearing loss. *Ear and Hearing*, 38(4), 441–454. <https://doi.org/10.1097/AUD.0000000000000414>
- Dowdall, N., Melendez-Torres, G. J., Murray, L., Gardner, F., Hartford, L., & Cooper, P. J. (2020). Shared picture book reading interventions for child language development: A systematic review and meta-analysis. *Child Development*, 91(2), e383–e399. <https://doi.org/10.1111/cdev.13225>
- Duursma, E. (2014). The effects of fathers' and mothers' reading to their children on language outcomes of children participating in early head start in the United States. *Fathering*, 12(3), 283–302. <https://doi.org/10.3149/fth.1203.283>
- Duursma, E., Pan, B. A., & Raikes, H. (2008). Predictors and outcomes of low-income fathers' reading with their toddlers. *Early Childhood Research Quarterly*, 23(3), 351–365. <https://doi.org/10.1016/j.ecresq.2008.06.001>
- Farrant, B. M., & Zubrick, S. R. (2013). Parent–child book reading across early childhood and child vocabulary in the early school years: Findings from the Longitudinal Study of Australian Children. *First Language*, 33(3), 280–293. <https://doi.org/10.1177/0142723713487617>
- Fieller, E. C., & Pearson, E. S. (1961). Tests for rank correlation coefficients. II. *Biometrika*, 48(1–2), 29–40. <https://doi.org/10.1093/biomet/48.1-2.29>
- Flores, G., Tomany-Korman, S. C., & Olson, L. (2005). Does disadvantage start at home?: Racial and ethnic disparities in health-related early childhood home routines and safety practices. *Archives of Pediatrics & Adolescent Medicine*, 159(2), 158–165. <https://doi.org/10.1001/archpedi.159.2.158>

- Funge, S. P., Sullivan, D. J., & Tarter, K. (2017). Promoting positive family interactions: Evaluating a free early childhood book distribution program. *Early Childhood Education Journal*, 45(5), 603–611. <https://doi.org/10.1007/s10643-016-0815-9>
- Gignac, G. E., & Szodorai, E. T. (2016). Effect size guidelines for individual differences researchers. *Personality and Individual Differences*, 102, 74–78. <https://doi.org/10.1016/j.paid.2016.06.069>
- Goldfeld, S., Napiza, N., Quach, J., Reilly, S., Ukoumunne, O. C., & Wake, M. (2011). Outcomes of a universal shared reading intervention by 2 years of age: The let's read trial. *Pediatrics (Evanston)*, 127(3), 445–453. <https://doi.org/10.1542/peds.2009-3043>
- Golova, N., Alario, A. J., Vivier, P. M., Rodriguez, M., & High, P. C. (1999). Literacy promotion for Hispanic families in a primary care setting: A randomized, controlled trial. *Pediatrics (Evanston)*, 103(5), 993–997. <https://doi.org/10.1542/peds.103.5.993>
- Grimm, P. (2011). Social desirability bias. In J. N. Sheth & N. K. Malhotra (Eds.), *Wiley International Encyclopedia of marketing research* (p. 1744). Wiley Online Library. <https://doi.org/10.1002/9781444316567.woem02057>
- Harvey, A. (2016). Improving family literacy practices. *SAGE Open*, 6(3), 215824401666997. <https://doi.org/10.1177/2158244016669973>
- Huebner, C. E. (2000). Community-based support for preschool readiness among children in poverty. *Journal of Education for Students Placed at Risk (JESPAR)*, 5(3), 291–314. https://doi.org/10.1207/S15327671ESPR0503_6
- Jain, V. G., Kessler, C., Lacina, L., Szumlas, G. A., Crosh, C., Hutton, J. S., Needlman, R., & Dewitt, T. G. (2021). Encouraging parental reading for high-risk neonatal intensive care unit infants. *The Journal of Pediatrics*, 232, 95–102. <https://doi.org/10.1016/j.jpeds.2021.01.003>
- Jimenez, M. E., Hudson, S. V., Lima, D., Mendelsohn, A. L., Pellerano, M., & Crabtree, B. F. (2019). Perspectives on shared reading among a sample of latino parents. *Child: Care, Health & Development*, 45(2), 292–299. <https://doi.org/10.1111/cch.12634>
- Kalb, G., & van Ours, J. C. (2014). Reading to young children: A head-start in life? *Economics of Education Review*, 40, 1–24. <https://doi.org/10.1016/j.econedurev.2014.01.002>
- Kumar, M. M., Cowan, H. R., Erdman, L., Kaufman, M., & Hick, K. M. (2016). Reach out and read is feasible and effective for adolescent mothers: A pilot study. *Maternal and Child Health Journal*, 20(3), 630–638. <https://doi.org/10.1007/s10995-015-1862-3>
- Landry, S. H., Smith, K. E., Swank, P. R., Zucker, T., Crawford, A. D., & Solari, E. F. (2012). The effects of a responsive parenting intervention on parent-child interactions during shared book reading. *Developmental Psychology*, 48(4), 969–986. <https://doi.org/10.1037/a0026400>
- Li, R., Rose, N., Zheng, Y. M., Chen, Y., Sylvia, S., Wilson-Smith, H., Medina, A., Dill, S. E., & Rozelle, S. (2021). Early childhood reading in rural China and obstacles to caregiver investment in young children: A mixed-methods analysis. *International Journal of Environmental Research and Public Health*, 18(4), 1457. <https://doi.org/10.3390/ijerph18041457>
- Logan, J. A. R., Justice, L. M., Yumuş, M., & Chaparro-Moreno, L. J. (2019). When children are not read to at home: The million word gap. *Journal of Developmental and Behavioral Pediatrics*, 40(5), 383–386. <https://doi.org/10.1097/DBP.0000000000000657>
- Marjanovič-Umek, L., Fekonja-Peklaj, U., & Sočan, G. (2017). Early vocabulary, parental education, and the frequency of shared reading as predictors of toddler's vocabulary and grammar at age 2;7: A Slovenian longitudinal CDI study. *Journal of Child Language*, 44(2), 457–479. <https://doi.org/10.1017/S0305000916000167>
- McArthur, G., & Castles, A. (2017). Helping children with reading difficulties: Some things we have learned so far. *Science of Learning*, 2(1), 7. <https://doi.org/10.1038/s41539-017-0008-3>
- Mendelsohn, A. L., Mogilner, L. N., Dreyer, B. P., Forman, J. A., Weinstein, S. C., Broderick, M., Cheng, K. J., Magloire, T., Moore, T., & Napier, C. (2001). The impact of a clinic-based literacy intervention on language development in inner-city preschool children. *Pediatrics (Evanston)*, 107(1), 130–134. <https://doi.org/10.1542/peds.107.1.130>
- National Early Literacy Panel. (2008). *Developing early literacy: Report of the national early literacy panel*. National Institute for Literacy. January 8, 2009, 218. <https://lincs.ed.gov/publications/pdf/NELPReport09.pdf>
- Newman, S. B. (1996). Children engaging in storybook reading: The influence of access to print resources, opportunity, and parental interaction. *Early Childhood Research Quarterly*, 11(4), 495–513. [https://doi.org/10.1016/S0885-2006\(96\)90019-8](https://doi.org/10.1016/S0885-2006(96)90019-8)
- Neyer, S. L., Szumlas, G. A., & Vaughn, L. M. (2021). Beyond the numbers: Social and emotional benefits of participation in the imagination library home-based literacy programme. *Journal of Early Childhood Literacy*, 21(1), 60–81. <https://doi.org/10.1177/1468798418810765>
- Noble, C., Sala, G., Peter, M., Lingwood, J., Rowland, C., Gobet, F., & Pine, J. (2019). The impact of shared book reading on children's language skills: A meta-analysis. *Educational Research Review*, 28, 100290. <https://doi.org/10.1016/j.edurev.2019.100290>
- O'Hare, L., & Connolly, P. (2014). A cluster randomised controlled trial of "bookstart +": A book gifting programme. *Journal of Children's Services*, 9(1), 18–30. <https://doi.org/10.1108/JCS-05-2013-0021>
- Parpucu, N., & Ezmeçi, F. (2023). The impact of shared book reading on children's phonological awareness skills: A meta-analysis. *Reading & Writing Quarterly*, 1–19. <https://doi.org/10.1080/10573569.2023.2245383>
- Paulson, J. F., Keefe, H. A., & Leiferman, J. A. (2009). Early parental depression and child language development. *Journal of Off Psychology and Psychiatry*, 50(3), 254–262. <https://doi.org/10.1111/j.1469-7610.2008.01973.x>

- Payne, A. C., Whitehurst, G. J., & Angell, A. L. (1994). The role of home literacy environment in the development of language ability in preschool children from low-income families. *Early Childhood Research Quarterly*, 9(3), 427–440. [https://doi.org/10.1016/0885-2006\(94\)90018-3](https://doi.org/10.1016/0885-2006(94)90018-3)
- Reschly, A. L. (2010). Reading and school completion: Critical connections and Matthew effects. *Reading & Writing Quarterly*, 26(1), 67–90. <https://doi.org/10.1080/10573560903397023>
- Ridzi, F., Sylvia, M., Qiao, X., & Craig, J. (2017). The imagination library program and kindergarten readiness: Evaluating the impact of monthly book distribution. *Journal of Applied Social Science*, 11(1), 11–24. <https://doi.org/10.1177/1936724416678023>
- Ridzi, F., Sylvia, M. R., & Singh, S. (2014). The imagination library program: Increasing parental reading through book distribution. *Reading Psychology*, 35(6), 548–576. <https://doi.org/10.1080/02702711.2013.790324>
- Roberts, J., Jurgens, J., & Burchinal, M. (2005). The role of home literacy practices in preschool children's language and emergent literacy skills. *Journal of Speech, Language, and Hearing Research*, 48(2), 345–359. [https://doi.org/10.1044/1092-4388\(2005/024\)](https://doi.org/10.1044/1092-4388(2005/024))
- Samiei, S., Bush, A. J., Sell, M., & Imig, D. (2016). Examining the association between the imagination library early childhood literacy program and kindergarten readiness. *Reading Psychology*, 37(4), 601–626. <https://doi.org/10.1080/02702711.2015.1072610>
- Schmitt, S. A., Simpson, A. M., & Friend, M. (2011). A longitudinal assessment of the home literacy environment and early language. *Infant and Child Development*, 20(6), 409–431. <https://doi.org/10.1002/icd.733>
- Senechal, M., & LeFevre, J.-A. (2002). Parental involvement in the development of children's reading skill: A five-year longitudinal study. *Child Development*, 73(2), 445–460. <https://doi.org/10.1111/1467-8624.00417>
- Sénéchal, M., LeFevre, J.-A., Hudson, E., & Lawson, E. P. (1996). Knowledge of storybooks as a predictor of young children's vocabulary. *Journal of Educational Psychology*, 88(3), 520–536. <https://doi.org/10.1037/0022-0663.88.3.520>
- Sharif, I., Reiber, S., & Ozuah, P. O. (2002). Exposure to reach out and read and vocabulary outcomes in inner city preschoolers. *Journal of the National Medical Association*, 94(3), 171–177.
- Singh, S., Sylvia, M. R., & Ridzi, F. (2015). Exploring the literacy practices of refugee families enrolled in a book distribution program and an intergenerational family literacy program. *Early Childhood Education Journal*, 43(1), 37–45. <https://doi.org/10.1007/s10643-013-0627-0>
- Skibbe, L. E., & Foster, T. D. (2019). Participation in the imagination library book distribution program and its relations to children's language and literacy outcomes in kindergarten. *Reading Psychology*, 40(4), 350–370. <https://doi.org/10.1080/02702711.2019.1614124>
- StataCorp. (2016). *Stata Statistical Software: Release 14.2*. StataCorp LLC.
- Taylor, C. L., Zubrick, S. R., & Christensen, D. (2016). Barriers to parent-child book reading in early childhood. *International Journal of Early Childhood*, 48(3), 295–309. <https://doi.org/10.1007/s13158-016-0172-2>
- Thakur, K., Sudhanthar, S., Sigal, Y., & Mattarella, N. (2016). Improving early childhood literacy and school readiness through reach out and read (ROR) program. *BMJ Quality Improvement Reports*, 5(1), u209772.w4137. <https://doi.org/10.1136/bmjquality.u209772.w4137>
- Theriot, J. A., Franco, S. M., Sisson, B. A., Metcalf, S. C., Kennedy, M. A., & Bada, H. S. (2003). The impact of early literacy guidance on language skills of 3-year-olds. *Clinical Pediatrics*, 42(2), 165–172. <https://doi.org/10.1177/000992280304200211>
- Tomopoulos, S., Dreyer, B. P., Tamis-LeMonda, C., Flynn, V., Rovira, I., Tineo, W., & Mendelsohn, A. L. (2006). Books, Toys, Parent-Child Interaction, and Development in Young Latino Children. *Ambulatory Pediatrics: The Official Journal of the Ambulatory Pediatric Association*, 6(2), 72–78. <https://doi.org/10.1016/j.ambp.2005.10.001>
- Tura, F., Wood, C., Thompson, R., & Lushey, C. (2023). Evaluating the impact of book gifting on the reading behaviours of parents and young children. *Early Years (London, England)*, 43(1), 75–90. <https://doi.org/10.1080/09575146.2021.1908234>
- van den Berg, H., & Bus, A. G. (2014). Beneficial effects of BookStart in temperamentally highly reactive infants. *Learning and Individual Differences*, 36, 69–75. <https://doi.org/10.1016/j.lindif.2014.10.008>
- Visser-Bochane, M. I., van der Schans, C. P., Krijnen, W. P., Reijneveld, S. A., & Luinge, M. R. (2021). Validation of the early language scale. *European Journal of Pediatrics*, 180(1), 63–71. <https://doi.org/10.1007/s00431-020-03702-8>
- Wade, B., & Moore, M. (2000). A sure start with books. *Early Years (London, England)*, 20(2), 39–46. <https://doi.org/10.1080/0957514000200205>
- Waldron, C. H. (2018). “Dream more, learn more, care more, and be more”: The imagination library influencing storybook reading and early literacy. *Reading Psychology*, 39(7), 711–728. <https://doi.org/10.1080/02702711.2018.1536094>
- Weitzman, C. C., Roy, L., Walls, T., & Tomlin, R. (2004). More evidence for reach out and read: A home-based study. *Pediatrics (Evanston)*, 113(5), 1248–1253. <https://doi.org/10.1542/peds.113.5.1248>
- Yeager Pelatti, C., Pentimonti, J. M., & Justice, L. M. (2014). Methodological review of the quality of reach out and read: Does it “work”? *Clinical Pediatrics*, 53(4), 343–350. <https://doi.org/10.1177/0009922813507995>
- Zgourou, E., Bratsch-Hines, M., & Vernon-Feagans, L. (2021). Home literacy practices in relation to language skills of children living in low-wealth rural communities. *Infant and Child Development*, 30(1). <https://doi.org/10.1002/icd.2201>

Appendix 1

Detailed methodology for the implementation of Dolly Parton's Imagination Library in Tamworth, NSW.

How did Dolly Parton's Imagination Library land in Tamworth?

Mark and Jay O'Shea (Australian country music duo artists) were introduced to Dolly Parton's Imagination Library in the USA when their first child was enrolled in the program in a hospital in Tennessee. The O'Shea's, being connected to the Tamworth country music scene, introduced the idea of the Imagination Library to Tamworth Regional Council (TRC) and proposed that a universal approach be adopted for the program.

TRC had concerns surrounding the school readiness of the children within the region, given data published in 2018 by the Australian Government on the development of children in their first year of full-time school through the Australian Early Development Census (AEDC, 2018). The census investigates not only children's language and cognitive skills, but also their communication skills, emotional maturity, social competence, physical health and wellbeing. The AEDC data can be mapped to the child's post/zip code, which is a common indicator used for socio-economic status. The Index of Relative Socio-economic Disadvantage (IRSD) is a general socio-economic index established by the Australian Government that summarizes a range of information about the social and economic conditions of people and households within a region (post/zip code). The index considers the number of households with low income, the number of people over 15 years of age with no educational attainment, unemployment, and the percentage of households with no internet connection. The index is ranked from 0 to 10, with a higher score indicating a relative lack of disadvantage in general. Combining the AEDC and IRSD provides a picture of the concerns facing regions within Australia and provides guidance for policymakers and planners for community initiatives/interventions. In 2016, Tamworth had an index of disadvantage of 5/10, suggesting that the region had a moderate level of disadvantage; however, when comparing Tamworth to all other regions within NSW with an equivalent level of disadvantage, Tamworth had proportionally more children vulnerable on all domains except emotional maturity. TRC identified that pre-literacy was the most significant problem in the community, especially as it was the small communities surrounding Tamworth that had such low scores on the AEDC, which demonstrated that access to literature was the key problem.

TRC investigated the Imagination Library and established that it aligned with five out of nine of their areas of investment: resilient and diverse community, connecting our regions and citizens, celebrating culture, strong vibrant identity, and livable environment. This, along with (a) the global enrollment of the program; (b) the integrity of UWA (the charity that distributes the program in Australia); (c) the program could access all children in the region, including the smaller more remote communities by mailbox delivery; (d) the child did not need to attend a pediatrician to obtain the books; (e) children received a total 60 age-appropriate, high-quality books consistently over five years; (f) the evidence from the literature supporting the impact of the program; (g) Tamworth is the "country music capital" of Australia and is the "sister city" to Nashville, the "country music capital" of the USA; and (h) Dolly Parton had performed in Tamworth, led TRC to decide to implement the Imagination Library universally in January 2019. This gave the council the opportunity to deliver books to every child in their home irrespective of their socio-economic situation, creating equality for all of the children, based on the idea that if they aimed to lift everyone, then everyone would lift.

Who and what was involved?

The TRC liaised with Tamworth Hospital to have the enrollment undertaken by maternity staff. Around this time, the McLean Foundation had become interested in supporting the Imagination Library and chose to fund the first books provided to families upon enrollment through the "Books for Newborns" initiative. Subsequently, the TRC and the library team began reaching out to local businesses and community groups to help fund the local program. The program in Tamworth is jointly funded by the council and community sponsorship at around 50% each, which provides sustainability to the program. It has become not just a council program but a whole-community effort, being the foundation for connection of many organizations supporting the initiative, such as the Rotary Club and Lion's Club. The program has been embraced widely and is seen as helping build the fabric of the community.

The Hunter New England Central Coast Primary Health Network (PHN) was offered the opportunity to become a sponsor of the local Imagination Library program. The PHN considered the program from a holistic perspective and developed a partnership with UWA to include health literacy with each book to further support families during the critical first year of early development. As part of the arrangement, PHN provided health flyers that were inserted into the books each month, which informed caregivers about local health services and community health issues such as up-and-coming immunization clinics, First Aid and Water Safety.

How were recruitment/enrollments into the Imagination Library undertaken?

At the commencement of the program, caregivers of newborn babies were given an enrollment form by the maternity staff and asked to take it, along with their baby's "My Personal Health Record," known as the "Blue Book," to the library to register their child for the Imagination Library. At this time, the baby would also receive a library card. However, after a few months, the uptake for the program was low (~40%), so the council organized for the nurse who conducted the

standard hearing test on the baby in the hospital to discuss the program with the caregivers and enroll their babies at the same time. The uptake for the program soared to 98% in Tamworth. The nurse who undertakes the enrollment has a map that outlines the local government area of Tamworth, and all babies who live within that mapped zone are eligible for the Imagination Library. There is no discrimination on the basis of ethnicity or socio-economic status.

What initiatives were undertaken throughout the community to enhance the literacy program?

The Central Northern Regional Library comprises a large network of 15 libraries, six of which fall within the Tamworth region; however, all 15 libraries are serviced by Tamworth City Library, making it the hub of the Northern Region of NSW. Tamworth library is a noncommercial, neutral, quiet public space in the community and welcomes everyone, providing not only a large array of books but also a series of workshops, computer access, and support networks. The library is responsible for processing the enrollment of all babies into the Imagination Library and issuing the babies their library card along with their very own personal letter addressed to them from the town mayor welcoming them to the Imagination Library. Along with the letter, the library also sends information to caregivers about programs being offered by the library, including Baby Book Time. Baby Book Time has seen a 265% increase in demand since the commencement of the Imagination Library in Tamworth. In 2017, only 10 babies (under one year old) registered for a library card across all the libraries (six branches) and only five in 2018. Between 2019 and October 2022, over 2,700 babies had registered. As a result of implementing the program, adult literacy classes and multicultural support are also offered in the library. In addition, the library provides outreach story time sessions to engage the local Indigenous communities and collaborates with local early childhood care services by providing information on the monthly book being delivered for inclusion in programming.

How are Imagination Library books selected?

UWA partners with Penguin Random House Australia, Hachette Australia, and other publishers and suppliers from time to time to source books. The program caters to children from birth to age five. Within this age range, six book groups correspond with birth year. Regardless of age, all children enrolling in the program receive the same welcome book.

Every two years, UWA holds a Book Selection Committee (BSC) to determine the books for the book list. BSC members come from a range of backgrounds and include speech pathologists, librarians, early childhood teachers, academics, and Aboriginal and Torres Strait Islander representatives. BSC members are provided with a range of books to review that meet program specifications. The scope of the BSC is to review each book for suitability for the program and consider the most appropriate book group for each title. BSC members are asked to provide feedback on book themes, which are also considered when creating the book list, ensuring that a mix of themes and book types are included across each group.

Who writes the tip sheets?

A tip sheet accompanies each book sent. The tip sheet provides information specific to the title received and is divided into tips for before reading, during reading, and after reading. The tip sheets are written by a speech pathologist at Early Education Childhood Intervention Service, and an early childhood teacher at 360 Early Education (previously Explore and Develop). Tip sheets are written in Plain English with icons to guide reading. They are designed to be fun and engaging and build confidence in caregivers to read to their infants and children.

Who is United Way Australia?

UWA is a community impact organization, focusing on preparing young people for success in life. Guided by community voice and aspirations, UWA unites residents, business, government, and philanthropy to help prepare children to read, learn, and succeed. In 2013, UWA acquired the license to operate the Imagination Library in Australia. UWA supports hundreds of Imagination Library programs nationwide in partnership with local and national organizations, business, and government, sending books to tens of thousands of children each month.

Appendix 2

Table A1. Summary of caregiver and child data collected at baseline, 6-months and 3-years.

	Baseline	6-months	3-years
Demographics (Child)			
Gender	✓	✓	✓
Age	✓	✓	✓
Early childhood attendance	✓	✓	✓
Disability	–	–	✓
Demographics (Caregiver)			
Age bracket	–	–	✓
Primary language spoken at home	✓	✓	✓
Highest education	✓	✓	✓
Employment status	–	–	✓
Children in the household enrolled	–	–	✓
Home Literacy Environment			
<i>Caregivers responded to three survey items for the home literacy environment.</i>			
Frequency of Shared Book Reading	✓	✓	✓
"How often do you read to your child?"			
Response options were: not applicable/too young, never, once every few months, once a month, once a fortnight, once a week, two times a week, three to five times a week, every day, or more than once a day.			
Duration of Shared Book Reading	✓	✓	✓
The caregiver was asked, "How many minutes on average would you spend reading at any one time?" The response option was a numeric value (e.g., 15 minutes).			
Number of Children's Books in the Home	✓	✓	✓
This was indexed with the question, "About how many children's books do you estimate your child has in your home now, including any library books?" Response options were: none, 0–9, 10–24, 25–100, or more than 100.			
Reading Attitudes and Interactions			
<i>Caregivers responded to nine survey items about the reading attitudes and interactions of children, caregivers, and the community. A variety of response options were used: five-point Likert scales, yes/no responses, and free-text writing.</i>			
Child's Interest in Books/Reading.		✓	✓
Caregivers were asked, "How often does your child ask to be read to? This could include picking up a book, bringing a book to you or verbally asking to be read to, for example?" Response options were: never, once a month, every few weeks, once a week, once a day, or more than once a day.			
Connection Between Caregiver and Child.		✓	✓
This was indexed with the statement, "I feel more connected to my child through reading and books provided by Dolly Parton's Imagination Library" with response options: strongly disagree, disagree, neutral, agree, strongly agree.			
Quality Time Spent in Shared Book Reading.		✓	✓
This was measured with the statement, "We spend more quality time together as a family with the books" with response options: strongly disagree, disagree, neutral, agree, strongly agree.			
Importance of Shared Book Reading.	✓	✓	✓
Caregivers were asked, "How important do you believe it is to read with your child?" Response options were: not at all important, not very important, somewhat important, important, very important.			
Program Feedback.		✓	✓
This was measured by asking, "How likely are you to recommend this program to your family and friends?" Responses were: not at all likely, a little likely, neutral, somewhat likely, very likely.			
Usefulness of Tip Sheets.		✓	✓
This was indexed with the statement, "The book tip sheets are useful when guiding my reading with Dolly Parton's Imagination Library books" with response options: not at all, a little, neutral, somewhat useful, very useful.			
Benefits of the Program.		✓	✓
Caregivers were offered a free-text response option to the question, "What benefits have you seen as a result of your child being on the Imagination Library program?"			

(Continued)

Table A1. (Continued).

	Baseline	6–months	3–years
Reading Techniques. The caregiver was asked to respond “yes” if they used any of the following: (a) repeating/teaching rhyming words, (b) repeating/teaching letter sounds, (c) counting images/objects, and (d) discussing the plot.		✓	✓
Use of Tamworth City Library Caregivers were asked three questions: (a) “Does your child have a library card?,” (b) “In the past six months, has your child visited a library?,” and (c) “Has any other family member taken your child to an early childhood event at Tamworth City Library?” Response options were yes or no.			✓
Emerging Literacy Skills <i>Caregivers responded to 11 items</i>			
Concepts About Print Caregivers responded to two statements: “My child holds books the correct way up and turns pages for reading” and “My child pretends to read by pointing to words or moving their finger left to right across the writing.”			✓
Alphabet Knowledge Caregivers were asked two items: “My child can name letters that you point to” and “My child can make the sounds of the letters you point to.”			✓
Receptive Vocabulary This was measured with two statements: “My child answers to questions like who, what, when, where, and why?” and “My child can follow directions that include two or more steps.”			✓
Expressive Vocabulary Caregivers answered two items: “My child can retell the sequence of events in a story or an activity (e.g., making something)” and “My child can connect two sentences using the word ‘and.’”			✓
Phonological Awareness This was indexed using two statements: “My child can rhyme (e.g., if I ask them what rhymes with ‘bed,’ they would say red, head, said, etc.)” and “My child can name words beginning with a certain sound (e.g., if I ask them what starts with ‘b’ they would say bed, bath, ball, etc.).”			✓
Phonological Memory This was measured by the statement, “My child can repeat new words that they hear.”			✓
Qualitative Feedback “If you would like to share additional feedback on the program or notes on this survey, you are welcome to do so here.”		✓	✓

Cover sheet: Supporting document #2



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Home-based shared book reading and developmental outcomes in young children: a systematic review with meta-analyses

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The aim of this systematic review was to measure the strength of the relationship between home-based shared book reading and child development. We identified 46 studies ($N = 56,576$) that provided quantitative data on the home literacy environment and developmental outcomes for groups of 10 or more children (maximum $N = 10,533$) who had a mean age of <4 years, and had not commenced compulsory, formal schooling. Most studies ($n = 28/46$; 61%, $N = 24,859$) reported correlation coefficients, which were used to calculate mean effect sizes in a series of meta-analyses. The results estimated large and statistically significant relationships between home-based shared book reading and developmental outcomes [$r = 0.303$, 95% CI = (0.258, 0.349)], language outcomes [$r = 0.381$, 95% CI = (0.289, 0.474)], and vocabulary outcomes [$r = 0.314$, 95% CI = (0.291, 0.336)]; as well as a moderate and significant relationship between frequency of home-based shared book reading and expressive vocabulary [$r = 0.259$, 95% CI = (0.099, 0.419)]. These findings indicate that home-based shared book reading is positively related to various developmental outcomes, particularly spoken language skills.

KEYWORDS

home-based shared book reading, home literacy environment, developmental outcomes, meta-analyses, frequency of home-based shared book reading

Introduction

Home-based shared book reading typically involves a caregiver—often a parent—reading a book to a child (Celano et al., 1998; Crosh et al., 2022; DesJardin et al., 2017). For example, many caregivers read a book to their child as part of a bedtime routine and ask them questions about the book's content. Home-based shared book reading is typically measured using “home literacy environment” (HLE) measures which can include frequency, duration, age-of-onset of home-based shared book reading, and the number of children's books in the home (Payne et al., 1994).

It has been claimed that a child's home literacy environment—and hence their home-based shared book reading—represents their primary learning environment before they start school (Dexter and Stacks, 2014). This raises the question of whether home-based shared book reading has an impact on a child's cognitive or socio-emotional development

before they start school. Until now, no systematic review has been designed to address this question. However, four reviews with meta-analyses have estimated the strength of the association between programs that include home-based shared book reading and cognitive developmental outcomes in children aged up to 9 years (see [Supplementary Table 1](#) for a summary of each review). In a review of 19 studies ($N = 3,556$ children), [Barone et al. \(2019\)](#) reported a small but significant association between home-based shared book reading and expressive [$d = 0.21$, $CI = (0.1, 0.29)$] and receptive vocabulary [$d = 0.19$, $CI = (0.11, 0.27)$] in children aged from 1 to 6 years. Similarly, a review of 19 studies ($N = 2,594$ parent-child dyads) by [Dowdall et al. \(2020\)](#) reported significant relationships between home-based book sharing interventions and expressive language [moderate effect; $d = 0.41$, $CI = (0.20, 0.61)$] as well as receptive language [small effect; $d = 0.26$, $CI = (0.12, 0.40)$] in children aged from 1 to 6 years. These reviews suggest that a small-to-moderate significant relationship may exist between home-based shared book reading and receptive and expressive spoken language.

The remaining two systematic reviews with meta-analyses measured the association between shared book reading and “emerging literacy skills.” [Sénéchal and Young \(2008\)](#) found a significant moderate association [$d = 0.65$, $CI = (0.53, 0.76)$] between home-based shared book reading (measured as parental involvement: family environment, literacy practices, parent curriculum and school relations, parent reading and tutoring) and children’s reading acquisition (letter-name knowledge, letter-sound knowledge, and early phonological decoding) in a meta-analysis of 16 studies that included 1,340 children from kindergarten to grade 3. More recently, a meta-analysis of 44 studies ($N = 18,407$ children aged 0–9 years) by [de Bondt et al. \(2020\)](#) reported a small but significant association [$d = 0.29$, $CI = (0.23, 0.35)$] between home-based book gifting programs that aim to encourage shared book reading and composite measures of multiple emerging literacy and spoken language skills (i.e., concepts about print, letter knowledge, phonemic awareness, story comprehension, kindergarten readiness, school results, and expressive and receptive vocabulary) in children from 0 to 9 years. Together, these findings suggest a small-to-moderate significant relationship may exist between shared book reading and emerging literacy skills, although the strength of this suggestion is limited by the use of composite outcomes (i.e., a score based on combining two or more specific measures) which can hinder accurate interpretations.

The current study

In sum, four systematic reviews with meta-analyses have estimated the strength of the association between home-based shared book reading and cognitive developmental outcomes in children up to the age of 9. The results suggest small-to-moderate significant associations between home-based shared book reading and spoken language abilities and emerging literacy skills. While these estimates are encouraging, they provide limited insight into the question of whether home-based shared book reading has an impact on a child’s development before school for three reasons. First, each meta-analysis included data from children who

had started school and hence had received compulsory, formal classroom intensive instruction in spoken language and literacy. These school-based developmental gains would obscure those related specifically to home-based shared book reading. Second, no review measured development outcomes beyond spoken language and emerging literacy skills, such as socio-emotional development. Thus, we do not know if the impact of home-based shared book reading goes beyond language and literacy. Third, we do not know if specific components of shared book reading are associated with specific components of child development as this has not been considered by previous reviews. Different specific measures of shared book reading such as duration and frequency may have varying impacts on a child’s development ([McElvany et al., 2009](#)) therefore investigation into these would provide greater insight thus filling a gap in knowledge. For example, research has shown that the number of books in the home is associated with children’s early literacy experiences ([de Bondt et al., 2020](#)) and a child’s receptive vocabulary ([Bracken and Fischel, 2008](#)). However, because the number of books was incorporated into an overall composite outcome and not reported specifically, it is not possible to determine its individual relationship with a child’s development but rather only the composite outcomes relationship with the child’s development.

Therefore, the aim of this systematic review was to address these limitations whilst answering the question of whether home-based shared book reading has an impact on a child’s development. To this end, we conducted a primary meta-analysis to estimate the strength of the relationship across all measures (composite and specific) of home-based shared book reading and all measures (composite and specific) of child development in children with a mean age <4 years. In a series of secondary meta-analyses, we estimated the relationships between specific measures of home-based shared book reading and child development. Based on the available evidence, we predicted small-to-moderate significant relationships between shared book reading and spoken language and emerging literacy skills overall and more specific measures of shared book reading (e.g., frequency, duration, number of books in the home) and spoken language (e.g., language, vocabulary, receptive vocabulary, expressive vocabulary) and emerging literacy skills (e.g., concepts about print, letter names, rhyming). We made no predictions about the relationship between shared book reading and any other cognitive or socioemotional development outcomes due to the lack of relevant data.

Methods

This systematic review adheres to the design and reporting guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; [Shamseer et al., 2015](#)).

Eligibility criteria

Due to the high variability of the measurement and reporting of shared book reading, as noted above, this research cast a wide arc of inclusion for studies. It considered all types of studies including randomized controlled trials (RCTs), longitudinal studies, and

cross-sectional studies. A study was included if it was written in English and included at least one composite or specific measure for home-based shared book reading and at least one cognitive or socioemotional developmental outcome. Each study included at least 10 child participants who were not yet attending any compulsory, formal schooling and who spoke English as a primary or additional language. Each group of children had to have a mean age of <4 years. For example, if a group of children from a study had an age range from 3 to 6 years, no child in that group was attending any compulsory, formal schooling. These children were read to by a parent or caregiver at home.

A study was excluded if it assessed (1) outcomes after a child had started school, (2) reading at other locations (e.g., preschool, daycare center) and not the home, (3) storytelling rather than book reading, (4) shared reading with books without written words (5) multiple interventions (e.g., book reading plus television) and (6) interventions delivered by specialists on specific reading techniques (e.g., dialogic reading). In the one instance in which a study included both a disability cohort and a typically developing group, only the latter was included as the singular group would not have been a proportional representation with respect to the overall sample size ($N = 47$ studies) (Bills and Mills, 2022).

Information sources and search strategy

The search was conducted using comprehensive databases of relevant research disciplines: ERIC, APA Psycinfo, MEDLINE, EBSCOHost and Embase Ovid. All searches included Boolean operators, truncation, Medical Subject Headings (MeSH terms) and proximity operators and allowed the inclusion of studies from 1980 onwards. Keywords were used to represent family (parent, sibling, family, mother, father, brother or sister), location (home), activity (reading, literature, and picture book) and age (early child, infant, preschool). The search was conducted in November 2024. Reference lists of included articles were screened to determine if any critical studies had been missed by the search terms, and a further four studies were thus identified.

Study selection process

Screening of the studies involved a series of steps (see Figure 1 for the flowchart): search terms were agreed upon by the team of authors which were used by CG to search the databases. Titles and abstracts (not authors) of identified studies were uploaded by CG into SYRAS (<https://syras.org/>), where duplicates were removed. CG used SYRAS to include or exclude abstracts according to criteria, and then the team reconvened to discuss the validity of criteria. These steps were then repeated (twice) until the criteria were clearly valid and the final pool of abstracts identified. Full-text articles for included abstracts were downloaded by CG ($N = 158$), which were independently screened by pairs of authors (CG-GM, CG-AJ, CG-KK, CG-AS). CG identified any inconsistent decisions between authors, which were resolved via discussion. CG contacted the authors of studies that were missing relevant information ($N = 55$), and integrated relevant data for studies that

fulfilled our criteria. Studies that did not meet criteria or did not provide requested data were excluded from further analysis ($N = 52$). Reference lists of included studies were screened by CG to identify if any potentially relevant studies had been missed ($N = 4$).

Data collection process

Data from included studies were extracted by CG and double-checked by an independent research assistant. No discrepancies were found.

Data items

We extracted data from each included study for composite or specific measures of home-based shared book reading and developmental outcomes, sample sizes, calculated effect sizes, and participant ages (mean or range; see Table 1 and Supplementary Table 2). For studies that included multiple assessment points, data from the last time point was used. If a study provided effect sizes for both intervention and control groups, we included both in the meta-analyses since these groups represent independent samples.

Synthesis methods

To synthesize the data, we first had to decide which type of effect size would be used in the meta-analyses. We therefore identified the most common type of effect size reported by the included studies. For studies that reported another type of effect size, we attempted to translate the reported statistics into the most common effect size type. If this was not possible, we excluded the study. For example, if a study reported odds ratios, these were not converted to correlations.

Once we had a common effect size for each included study, we categorized each study according to the type of measure (composite vs. specific) used to assess home-based shared book reading (e.g., frequency vs. duration) and developmental outcomes (e.g., language, vocabulary, receptive and expressive vocabulary, emerging literacy, socioemotional outcomes). We then calculated mean effect sizes (1) across all included studies regardless of composite or specific measures of home-based shared book reading and developmental outcomes, and (2) across different subcategories of studies that measured the strength of the relationship between a measure of shared book reading (composite, specific, across composite and specific) and a measure of development (composite, specific, across composite and specific). Note that we only report the results for categories of studies with adequate statistical power (0.8) to detect a small relationship (Cohen, 1998). These categories included at least five studies and included at least 783 participants (Myung, 2023).

Statistical analyses

Effect sizes and sample sizes of included studies were imported into SPSS, and a Fisher's Z transformation was used to calculate the standard error. Meta-analyses were performed in SPSS using

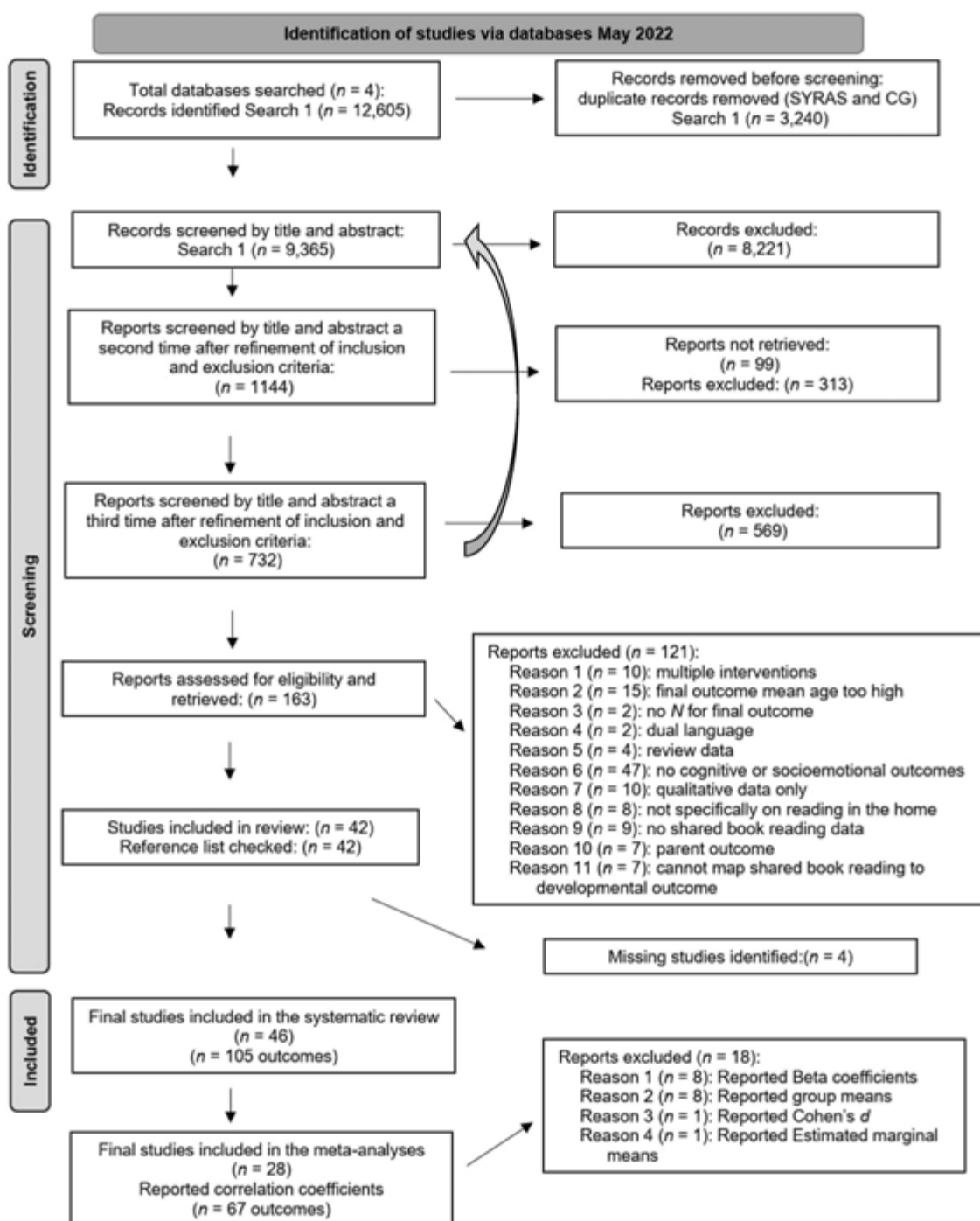


FIGURE 1
PRISMA 2020 flow diagram for new systematic reviews that include searches of database for Home-based shared book reading and developmental outcomes (overall).

random-effects weights based on the inverse-variance, including both within- and between-study variances. Restricted maximum likelihood was used, applying the iterative method and calculating the restricted maximum likelihood estimator. No standard error adjustment was made. A value of $p < 0.05$ was considered statistically significant in all relevant analyses. In line with the recommendations of Gignac and Szodorai (2016) and Funder

and Ozer (2019), we interpreted r -values of 0.10, 0.20, and 0.30 as small, moderate and strong relationships, respectively. In line with recommendations from Cohen (1998), we interpreted Cohen's d values of 0.2, 0.5, and 0.8 as small, moderate and strong relationships, respectively.

Forest plots were generated in SPSS, centered on the mean effect size. Funnel plots were generated to assess the studies for

TABLE 1 Studies included in the meta-analysis (all results).

Study	Shared book reading measure	Developmental outcome	Group where applicable or overall	<i>n</i>	Correlation coefficient <i>r</i>	<i>Effect size</i>	<i>SE of r</i>	Mean age at assessment (months) (maximum)	Type of study	Country
Attig and Weinert, 2020	Frequency	Vocabulary	Overall	2,272	0.27	Medium	0.02	26 (26)	Longitudinal	Germany
Chen and Ren, 2019	Frequency	Receptive vocabulary	Overall	84	0.137	Small	0.109	38 (60)	Cross-sectional	China
Chen and Ren, 2019	Frequency	Expressive vocabulary	Overall	84	0.169	Small	0.109	38 (60)	Cross-sectional	China
Debaryshe, 1993	Age began reading	Receptive vocabulary	Overall	41	0.39	Large	0.147	26 (30)	Cross-sectional	US
Debaryshe, 1993	Age began reading	Expressive vocabulary	Overall	41	0.33	Large	0.151	26 (30)	Cross-sectional	US
DeBaryshe, 1995	Composite shared book reading	Language	Low-income	60	0.31	Large	0.125	47.4 (60)	Cross-sectional	US
DeBaryshe, 1995	Composite shared book reading	Language	Working-class	56	0.12	Small	0.135	37.6 (60)	Cross-sectional	US
Deckner et al., 2006	Composite shared book reading	Receptive	Overall	47	0.53	Large	0.126	42 (44)	Longitudinal	US
Deckner et al., 2006	Composite shared book reading	Expressive vocabulary	Overall	48	0.34	Large	0.139	42 (44)	Longitudinal	US
Desjardin et al., 2017	Frequency	Receptive vocabulary	Typically developing	34	0.44	Large	0.159	36 (36)	Case-Control	US
Desjardin et al., 2017	Frequency	Expressive vocabulary	Typically developing	34	0.47	Large	0.156	36 (36)	Case-Control	US
Dexter and Stacks, 2014	Frequency	Cognitive development	Overall	28	0.259	Medium	0.189	24.7 (36)	Cross-sectional	US
Dexter and Stacks, 2014	Frequency	Receptive vocabulary	Overall	28	0.338	Large	0.185	24.7 (36)	Cross-sectional	US
Dexter and Stacks, 2014	Frequency	Expressive vocabulary	Overall	28	0.265	Medium	0.189	24.7 (36)	Cross-sectional	US
Farrant and Zubrick, 2011	Duration (min.)	Vocabulary	Overall	2,188	0.29	Medium	0.02	34.2 (37)	Longitudinal	Australia
Fekonja-Peklaj et al., 2015	Composite shared book reading	Language	Overall	99	0.16	Small	0.1	37.8 (72)	Cross-sectional	Slovenia

(Continued)

TABLE 1 (Continued)

Study	Shared book reading measure	Developmental outcome	Group where applicable or overall	<i>n</i>	Correlation coefficient <i>r</i>	<i>Effect size</i>	<i>SE of r</i>	Mean age at assessment (months) (maximum)	Type of study	Country
Fletcher et al., 2008	Composite shared book reading	Expressive vocabulary	Overall	87	0.03	No Effect	0.108	24 (24)	Longitudinal	US
Kim et al., 2015	Composite shared book reading	Vocabulary	Overall	6,050	0.31	Large	0.012	24.3 (38)	Longitudinal	US
Karousou and Economacou, 2024	Frequency	Vocabulary	Overall	740	0.32	Large	0.035	20 (36)	Cross-sectional	Greece
Li et al., 2021	Frequency	Cognitive development	Overall	1,748	0.64	Large	0.018	24 (24)	Cross-sectional	China
Lyytinen et al., 1998	Composite shared book reading	Expressive vocabulary	Overall	108	0.19	Small	0.095	24 (24)	Longitudinal	Finland
Lyytinen et al., 1998	Composite shared book reading	Vocabulary production	Overall	108	0.28	Medium	0.093	24 (24)	Longitudinal	Finland
Marjanovič-Umek et al., 2017	Frequency	Vocabulary	Overall	51	0.34	Large	0.134	31 (31)	Longitudinal	Slovenia
Niklas et al., 2020	Composite shared book reading	Language comprehension	Overall	133	0.55	Large	0.073	37 (45)	Longitudinal	Germany
Niklas et al., 2020	Composite shared book reading	Language production	Overall	133	0.55	Large	0.073	37 (45)	Longitudinal	Germany
Paulson et al., 2009	Frequency	Expressive vocabulary	Overall	4,109	0.09	No Effect	0.016	24 (24)	Cross-sectional	US
Richman and Colombo, 2007	Frequency	Receptive vocabulary	Overall	168	0.35	Large	0.073	10-17 (17)	Cross-sectional	US
Richman and Colombo, 2007	Frequency	Expressive vocabulary	Overall	168	0.41	Large	0.071	10-17 (17)	Cross-sectional	US
Roberts et al., 2005	Frequency	Receptive vocabulary	Overall	58	0.1	Small	0.133	36 (42)	Cross-sectional	US
Rodriguez et al., 2009	Composite shared book reading	Cognitive development	Overall	1,046	0.17	Small	0.03	36 (36)	Longitudinal	US
Rodriguez et al., 2009	Composite shared book reading	Receptive vocabulary	Overall	1,046	0.14	Small	0.031	36 (36)	Longitudinal	US

(Continued)

TABLE 1 (Continued)

Study	Shared book reading measure	Developmental outcome	Group where applicable or overall	<i>n</i>	Correlation coefficient <i>r</i>	<i>Effect size</i>	<i>SE of r</i>	Mean age at assessment (months) (maximum)	Type of study	Country
Rose et al., 2018	Composite shared book reading	Language	Overall	547	0.42	Large	0.039	43 (48)	Longitudinal	Germany
Schlesinger et al., 2019	Duration	Receptive vocabulary	Overall	68	0.23	Medium	0.12	41 (47)	Cross-sectional	US
Schmitt et al., 2011	Composite shared book reading	Vocabulary	Overall	50	0.55	Large	0.121	18.2 (21)	Longitudinal	US
Schmitt et al., 2011	Composite shared book reading	Language	Overall	50	0.35	Large	0.135	18.2 (21)	Longitudinal	US
Shen and Del Tufo, 2022	Frequency	Recognize letters	Overall	965	0.204	Medium	0.032	45.5 (79)	Longitudinal	US
Shen and Del Tufo, 2022	Duration	Recognize letters	Overall	965	0.184	Small	0.032	45.5 (79)	Longitudinal	US
Teepe et al., 2017	Composite shared book reading	Vocabulary	Overall	223	0.32	Large	0.064	35.4 (44)	Longitudinal	Nether-lands
Tomopoulos et al., 2006	Composite shared book reading	Cognitive development	Overall	46	0.29	Medium	0.144	21 (21)	Cross-sectional	US
Tomopoulos et al., 2006	Composite shared book reading	Receptive vocabulary	Overall	44	0.29	Medium	0.148	21 (21)	Cross-sectional	US
Tomopoulos et al., 2006	Composite shared book reading	Expressive vocabulary	Overall	44	0.05	No Effect	0.154	21 (21)	Cross-sectional	US
Tomopoulos et al., 2006	Number of books in the home	Cognitive development	Overall	46	0.36	Large	0.152	21 (21)	Cross-sectional	US
Tomopoulos et al., 2006	Number of books in the home	Receptive vocabulary	Overall	44	0.32	Large	0.156	21 (21)	Cross-sectional	US
Tomopoulos et al., 2006	Number of books in the home	Expressive vocabulary	Overall	44	0.05	No effect	0.156	21 (21)	Cross-sectional	US
Tomopoulos et al., 2006	Frequency	Cognitive development	Overall	46	0.24	Medium	0.146	21 (21)	Cross-sectional	US
Tomopoulos et al., 2006	Frequency	Receptive vocabulary	Overall	44	0.24	Medium	0.150	21 (21)	Cross-sectional	US
Tomopoulos et al., 2006	Frequency	Expressive vocabulary	Overall	44	0.00	No Effect	0.154	21 (21)	Cross-sectional	US

TABLE 1 (Continued)

Study	Shared book reading measure	Developmental outcome	Group where applicable or overall	<i>n</i>	Correlation coefficient <i>r</i>	Effect size	SE of <i>r</i>	Mean age at assessment (months) (maximum)	Type of study	Country
Torppa et al., 2022	Composite shared book reading	Vocabulary	Risk of dyslexia	106	0.38	Large	0.091	24 (24)	Longitudinal	Finland
Torppa et al., 2022	Composite shared book reading	Vocabulary	No risk of dyslexia	92	0.33	Large	0.1	24 (24)	Longitudinal	Finland
Wirth et al., 2020	Composite shared book reading	Language comprehension	Overall	118	0.38	Large	0.093	36.9 (45)	Cross-sectional	Germany
Wirth et al., 2020	Composite shared book reading	Language production	Overall	115	0.38	Large	0.094	36.9 (45)	Cross-sectional	Germany
Wirth et al., 2020	Frequency	Language comprehension	Overall	118	0.42	Large	0.084	36.9 (45)	Cross-sectional	Germany
Wirth et al., 2020	Frequency	Language production	Overall	115	0.34	Large	0.088	36.9 (45)	Cross-sectional	Germany

publication bias and examination of Egger’s test (Egger et al., 1997). The “trim and fill” method was used to estimate the number of missing studies and compute any artificial studies needed to determine an unbiased estimate of the mean effect size. I^2 was calculated as the measure of heterogeneity for each meta-analysis (Francis et al., 2019) to determine the proportion of variability explained by the differences between the studies included in each of the meta-analyses. Given the expected high heterogeneity based on the variety of study designs and outcome reporting, the random-effects model was chosen as this assumes that each study estimates a different underlying true effect (Tufanaru et al., 2015).

We did two types of sensitivity analyses for each meta-analysis. First, we repeated each meta-analysis with low-quality studies removed. Second, we repeated each meta-analysis with highly variable outcomes removed (i.e., $SE > 0.15$). We concluded that an original meta-analysis had adequate sensitivity if there was little change in the overall estimated mean (?).

Assessment of study quality and risk of bias

Included studies were assessed for risk of bias using the Newcastle-Ottawa Scale (Wells et al., 2000), which is recommended by the Cochrane Collaboration for non RCT studies (Francis et al., 2019). Three categories were assessed: selection (maximum score of 4), comparability (maximum 2), and outcome (maximum 3). A total raw score of 0–3 was classified as poor quality, 4–6 as fair and 7–9 as good (see Table 2).

An adaptation of the Grading of Recommendations Assessment, Development and Evaluation (GRADE) criteria was applied to the studies included in the meta-analyses to determine a quality-of-evidence rating. The quality of evidence for each outcome was based on: (1) median GRADE values: I^2 (0–50 high quality, 51–74 moderate quality, ≥ 75 low quality; Francis et al., 2019); (2) the number of studies included in the meta-analysis (≥ 10 high quality, 5–9 moderate quality, < 5 low quality); (3) the total sample size of the meta-analysis ($N \geq 1,000$ high quality, $N = 51$ –999 moderate quality, $N \leq 50$ low quality); (4) the risk-of-bias rating (majority good—high quality, majority fair—moderate quality, majority low—low quality); and (5) the publication bias based on the Eggers test (> 0.05 high quality, ≤ 0.05 low quality; see Table 3).

Guided by the criteria provided by Glenton et al. (2010), we used predefined wording to express the overall quality of evidence for each outcome. Specifically, if an outcome was supported by high quality of evidence, we concluded that there was “a relationship” between home-based shared book reading and a developmental outcome. If an outcome was supported by moderate quality evidence, then we concluded that there was a “probable relationship.” And if an outcome was supported by low quality evidence, then there was an “uncertain relationship.”

Results

Study selection

A total of 10,605 studies were identified. Having removed 3,240 duplicates, we screened the titles and abstracts of 9,365 articles

TABLE 2 Risk of bias for studies included in the meta-analysis.

Study	Shared book reading measure	Outcome	Groups, where applicable, or overall	Selection	Comparability	Outcome	Total	Quality
Attig and Weinert, 2020	Frequency	Vocabulary	Overall	2	1	3	6	Fair
Chen and Ren, 2019	Frequency	Receptive and expressive	Overall	1	1	2	4	Fair
Debaryshe, 1993	Age began reading	Receptive and expressive	Overall	0	0	2	2	Low
DeBaryshe, 1995	Composite shared book reading	Language	Low-income vs. working-class	2	1	2	5	Fair
Deckner et al., 2006	Composite shared book reading	Receptive and expressive	Overall	2	0	3	5	Fair
Desjardin et al., 2017	Frequency	Receptive and expressive	Typically developing	3	0	3	6	Fair
Dexter and Stacks, 2014	Frequency	Cognitive development, receptive, expressive	Overall	2	0	2	4	Fair
Farrant and Zubrick, 2011	Duration (min.)	Vocabulary	Overall	2	1	3	6	Fair
Fekonja-Peklaj et al., 2015	Composite shared book reading	Language	Overall	2	1	2	5	Fair
Fletcher et al., 2008	Composite shared book reading	Expressive	Overall	2	0	3	5	Fair
Kim et al., 2015	Composite shared book reading	Vocabulary	Overall	2	1	3	6	Fair
Karousou and Economacou, 2024	Frequency	Vocabulary	Overall	3	1	3	7	Good
Li et al., 2021	Frequency	Cognitive development	Overall	2	1	2	5	Fair
Lyytinen et al., 1998	Composite shared book reading	Expressive and vocabulary production	Overall	2	1	3	6	Fair
Marjanović-Umek et al., 2017	Frequency	Vocabulary	Overall	2	1	3	6	Fair
Niklas et al., 2020	Composite shared book reading	Language comprehension and language production	Overall	1	1	3	5	Fair
Paulson et al., 2009	Frequency	Expressive	Overall	2	0	2	4	Fair
Richman and Colombo, 2007	Frequency	Receptive and expressive	Overall	1	1	1	3	Low
Roberts et al., 2005	Frequency	Receptive	Overall	3	1	3	7	Good
Rodriguez et al., 2009	Composite shared book reading	Cognitive development and receptive	Overall	3	1	2	6	Fair

(Continued)

TABLE 2 (Continued)

Study	Shared book reading measure	Outcome	Groups, where applicable, or overall	Selection	Comparability	Outcome	Total	Quality
Rose et al., 2018	Composite shared book reading	Language	Overall	2	1	2	5	Fair
Schlesinger et al., 2019	Duration (min.)	Receptive	Overall	1	1	2	4	Fair
Schmitt et al., 2011	Composite shared book reading	Vocabulary and language	Overall	0	1	0	1	Low
Shen and Del Tufo, 2022	Frequency, duration (min.)	Recognize letters	Overall	1	1	0	2	Low
Teepe et al., 2017	Composite shared book reading	Vocabulary	Overall	1	1	2	4	Fair
Tomopoulos et al., 2006	Composite shared book reading	Cognitive development, receptive, expressive	Overall	3	1	3	7	Good
Torppa et al., 2022	Composite shared book reading	Vocabulary	Risk of dyslexia vs. no risk of dyslexia	3	1	2	6	Fair
Wirth et al., 2020	Frequency	Language comprehension and language production	Overall	1	1	2	4	Fair

TABLE 3 Adaptation of GRADE criteria.

I^2		Number of studies		N sizes within studies		Total N in overall effect		Risk-of-bias rating		Publication bias Eggers test		Overall
0–50	High quality	≥ 10	High quality	Majority a ($\geq 1,000$)	High quality	$\geq 1,000$	High quality	Majority a (good)	High quality	$a \geq 0.05$	High quality	Majority, or if even, median chosen
51–74	Moderate quality	5–9	Moderate quality	Majority b (51–999)	Moderate quality	51–999	Moderate quality	Majority b (fair)	Moderate quality	$b < 0.05$	Low quality	
≥ 75	Low quality	< 5	Low quality	Majority c (≤ 50)	Low quality	≤ 50	Low quality	Majority c (low)	Low quality			

against the inclusion criteria. A total of 9,202 were identified as irrelevant and were excluded, leaving 163. We excluded a further 121 articles after accessing the full manuscript (see [Figure 1](#)), leaving 42 articles for inclusion. The reference lists of these 42 articles were screened, where a further four articles met the inclusion criteria and were therefore included in the research. A total of 46 articles met the inclusion criteria for the systematic review (see [Figure 1](#)).

Of those 46 studies, 28 provided correlation coefficients between measures of home-based shared book reading and developmental outcomes and were included in the meta-analyses (see [Table 1](#)). Of the 18 remaining studies, 17 reported effect sizes that could not be converted into correlation coefficients (Note: provided means or beta statistics without standard deviations; see [Supplementary Table 2](#)). An additional study by [Mendelsohn et al. \(2020\)](#) did report Cohen's *d*, but we could not convert this into a correlation coefficient with confidence due to the dichotomisation of a continuous variable to create the treatment and control groups (see [Supplementary Table 2](#) for the findings of the 18 studies that could not be included in the meta-analyses).

It is noteworthy that only one included study recruited participants with a disability (hearing loss). We used data from the typically developing control group to represent this study. Thus, the selection procedure identified 28 studies that provided relevant data and could be included in the meta-analyses.

Participants

For the $N = 28$ studies the total sample size was 24,859 (mean sample size per study of 887). The mean age of the children was 30.2 months (Range 10–79 months) and the proportion of people who identified as female and male were 52% and 48% respectively. The mean percentage of participants reported as Caucasian or white was 45%, African-American or Black 22%, Asian 16%, and Other 18%.

Home-based shared book reading outcomes

Five home-based shared book reading measures were reported: home-based shared book reading (composite measure; 47%), frequency (specific measure; 38%), duration (specific; 9%), number of books in the home (specific; 3%) and age of onset (specific; 3%).

Developmental outcomes

Six measures of child development were reported: composite measure (48%), language (composite; 11%), vocabulary (composite; 10%), receptive vocabulary (specific; 12%), expressive vocabulary (specific; 12%), cognitive development (composite; 6%) and recognizing letters (1%).

Language (composite)

Six studies reported language as a composite measure (i.e., not specifically as language comprehension or language production).

Two used the German Language Development Test (SETK 3–5; [Grimm et al., 2010](#)), and four used other assessments: the MacArthur-Bates Communicate Development Inventory (CDI) ([Fenson et al., 2006](#)), the Scales of General Language Development-LJ (SGLD-LJ) ([Marjanovič-Umek et al., 2008](#)), the Peabody Picture Vocabulary Test (PPVT-4) ([Dunn and Dunn, 2007](#)) with the Expressive Vocabulary Test (EVT-2; [Williams, 1997](#)), and the SETK 3–5 with the PPVT-R (Unpublished German version of the PPVT).

Vocabulary (composite)

Seven studies reported vocabulary as a composite measure (i.e., not specifically as receptive vocabulary or expressive vocabulary). Two used the CID, one used the PPVT (Dutch version) one used the ELFRA ([Grimm and Doil, 2006](#)) a German assessment comparable to the CDI and one used the Communication Development Report (Greek).

Receptive vocabulary (specific)

Ten studies reported receptive vocabulary as a specific measure. Five used the PPVT-4 and two used the Preschool Language Scale (PLS) ([Zimmerman et al., 2011](#)). Three used other assessments: the Reynell Developmental Language Scales ([Edwards and Reynell, 1997](#)), the CDI and the Bayley Scales of Infant Development (BSID; [Michalec, 2011](#)) measuring receptive vocabulary.

Expressive vocabulary (specific)

Ten studies reported expressive vocabulary as a specific measure. Three used the CDI, two used the PPVT-4, two used the PLS and two used the BSID. Two used other assessments: the Reynell Developmental Language Scales and the Expressive Vocabulary Test (EVT-2; [Williams, 1997](#)).

Cognitive development (composite)

Four studies reported cognitive development as a composite outcome. All four used the BSID.

Recognizing letters (specific)

One study reported emerging literacy skills as a questionnaire to caregivers.

Data analyses

If a study measured home-based shared book reading using both composite and specific scores, we selected the former. In addition, if a study measured multiple developmental outcomes, we calculated the relationship between home-based shared book reading and each of these outcomes. This produced $N = 45$ estimates across the 28 included studies (see [Table 1](#)).

In total, there were 18 combinations of home-based shared book reading measures ($N = 5$) and developmental measures ($N = 6$). However, only six combinations met our criteria for statistical

TABLE 4 Quantitative results for studies included in the meta-analyses.

Home-based shared book reading outcomes	Developmental outcomes	Number of papers	Sample size total $N > 783$	Effect size r (95% CI)	Overall quality and statement
Home-based shared book reading overall (composite or specific)	Developmental outcomes overall (composite or specific)	28	24,358	0.303 (0.258, 0.349)	Moderate quality “Probable association”
Home-based shared book reading (composite)	Developmental outcomes overall (composite or specific)	14	10,456	0.312 (0.252, 0.373)	Moderate quality “Probable association”
Home-based shared book reading (composite)	Language (composite)	6	1,311	0.381 (0.289, 0.474)	Moderate quality “Probable association”
Home-based shared book reading (composite)	Vocabulary (composite)	5	6,629	0.314 (0.291, 0.336)	Moderate quality “Probable association”
Home-based shared book reading (composite)	Receptive vocabulary (specific)	3	1,137	–	–
Home-based shared book reading (composite)	Expressive vocabulary (specific)	4	287	–	–
Home-based shared book reading (composite)	Cognitive development (composite)	2	1,092	–	–
Home-based shared book reading (specific: frequency)	Developmental outcomes (composite or specific)	11	10,599	0.301 (0.214, 0.388)	Moderate quality “Probable association”
Home-based shared book reading (specific: frequency)	Language (composite)	1	118	–	–
Home-based shared book reading (specific: frequency)	Vocabulary (composite)	2	2,323	–	–
Home-based shared book reading (specific: frequency)	Receptive vocabulary (specific)	5	372	–	–
Home-based shared book reading (specific: frequency)	Expressive vocabulary (specific)	5	4,423	0.259 (0.099, 0.419)	Moderate quality “Probable association”
Home-based shared book reading (specific: frequency)	Cognitive development (composite)	3	1,802	–	–
Home-based shared book reading (specific: duration)	Developmental outcomes overall (composite or specific)	3	3,221	–	–
Home-based shared book reading (specific: age began reading)	Developmental outcomes overall (composite or specific)	1	41	–	–
Home-based shared book reading (specific: number of books in the home)	Developmental outcomes overall (composite or specific)	1	46	–	–

power (i.e., at least five studies and 783 participants; see Table 4 for excluded combinations):

Quality of studies

When assessing bias on the $N = 28$ studies included in the meta-analyses all studies were either longitudinal or cross-sectional with the majority assessed as fair quality (21/28, 75%), four as low quality (18%) and the remainder as good (7%; see Table 3).

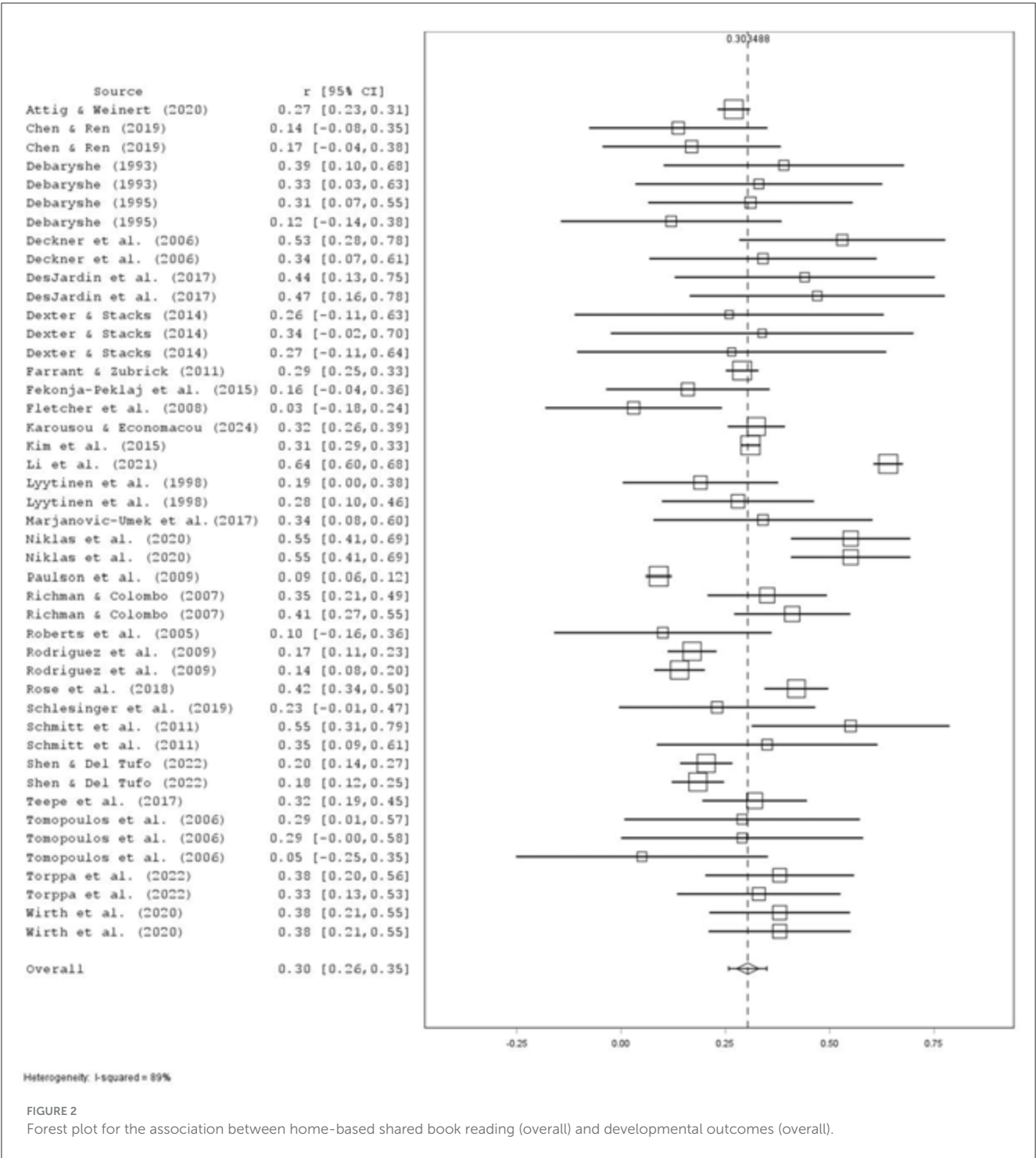
Meta-analyses results

The following results are presented in two sections. Firstly, Section 1 presents the results of the meta-analyses relating to home-based shared book reading when measured as either a composite and specific outcome and the associations with developmental

outcomes. Secondly, Section 2 presents the results of the meta-analyses relating to the specific measure of the frequency of home-based shared book reading and the associations with developmental outcomes.

Section 1: home-based shared book reading (composite and specific) and developmental outcomes (composite and specific)

Data from 28 studies ($N = 24,358$ participants) contributed to the meta-analysis of the relationship between home-based shared book reading overall (across composite and specific measures) and developmental outcomes overall (across composite and specific measures). The meta-analysis estimated a strong and significant relationship between home-based shared book reading overall and developmental outcomes overall [$r = 0.303$, 95% CI = (0.258, 0.349), $p < 0.001$; see Table 4 and Figures 2, 3]. A similar result was found when removing the studies with a high risk of bias or SE > 0.15 (see Supplementary Table 3).



Home-based shared book reading (composite) and developmental outcomes (composite and specific)

Data from 14 studies (N = 10,456 participants) contributed to the meta-analysis of the relationship between home-based shared book reading (composite measures) and developmental outcomes overall (across composite and specific measures). The meta-analysis estimated a strong and significant relationship between home-based shared book reading and developmental outcomes [$r = 0.312$, 95% CI = (0.252, 0.373), $p < 0.001$; see Table 4

and Supplementary Figure 1]. A similar result was found when removing the studies with a high risk of bias and after conducting the sensitivity analysis (see Supplementary Table 3).

Home-based shared book reading (composite) and spoken language (composite)

Data from six studies (N = 1,311 participants) contributed to the meta-analysis of the relationship between home-based shared book reading (composite) and language (composite). The

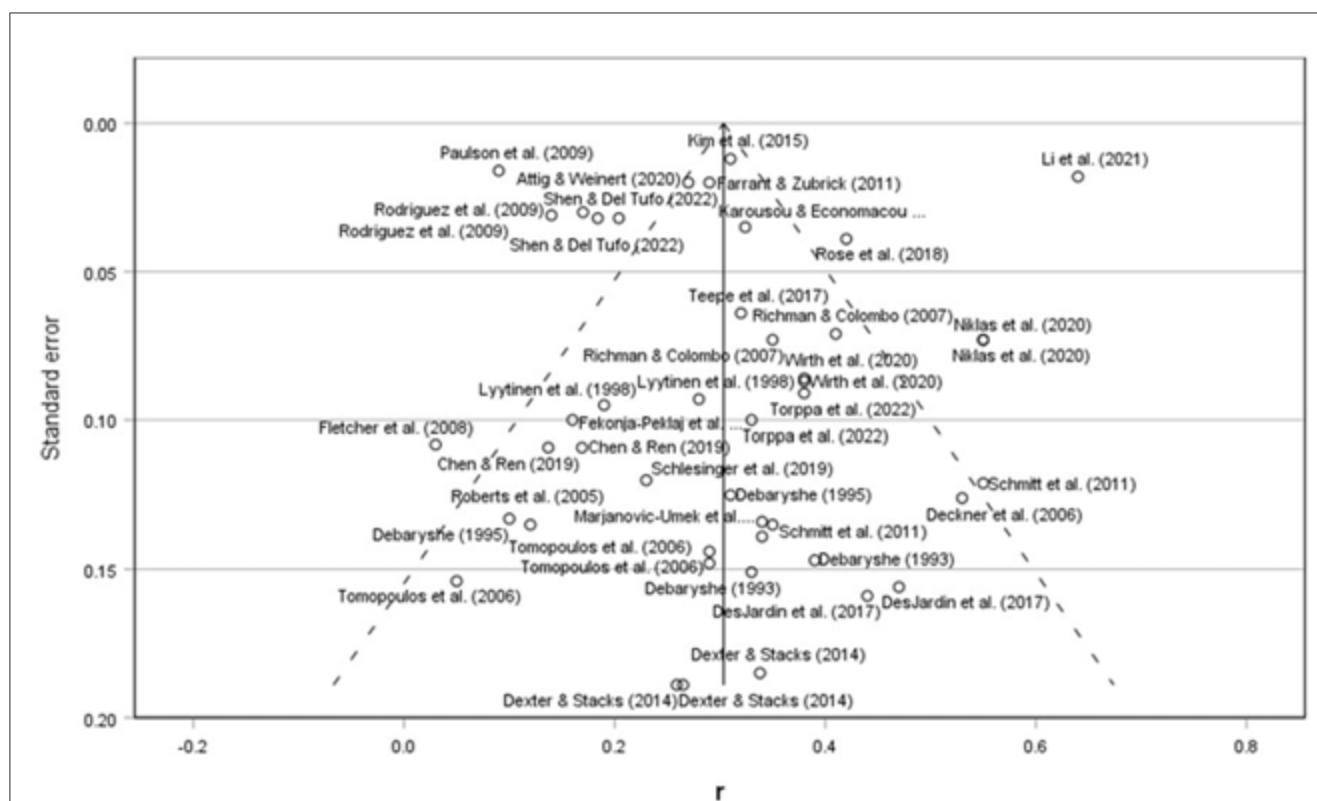


FIGURE 3

Funnel plot for the associations between Home-based shared book reading (overall) and developmental outcomes (overall).

meta-analysis estimated a strong and significant relationship between home-based shared book reading with language [$r = 0.381$, 95% CI = (0.289, 0.474), $p < 0.001$; see [Table 4](#) and [Supplementary Figure 2](#)]. A similar result was found after removing the study with a high risk of bias (see [Supplementary Table 3](#)).

Home-based shared book reading (composite) and vocabulary (composite)

Data from five studies ($N = 6,629$ participants) contributed to the meta-analysis of the relationship between home-based shared book reading (composite) and vocabulary (composite). The meta-analysis estimated a large and strong relationship between home-based shared book reading and vocabulary [$r = 0.314$, 95% CI = (0.291, 0.336), $p < 0.001$; see [Table 4](#) and [Supplementary Figure 3](#)]. A similar result was found when removing the study with a high risk of bias (see [Supplementary Table 3](#)).

Section 2: home-based shared book reading frequency (specific) and developmental outcomes (composite and specific)

Data from 11 studies ($N = 10,599$ participants) contributed to the meta-analysis of the relationship between home-based shared book reading (specific: frequency) and developmental outcomes overall (composite or specific measures). The meta-analysis estimated a strong and significant relationship between frequency of home-based shared book reading and developmental

outcomes overall [$r = 0.301$, 95% CI = (0.214, 0.388), $p < 0.001$; see [Table 4](#) and [Supplementary Figures 4, 5](#)]. A similar result was found when removing the studies with a high risk of bias (see [Supplementary Table 3](#)) and after conducting the sensitivity analysis.

Home-based shared book reading frequency (specific) and expressive vocabulary (specific)

Data from five studies ($N = 4,423$ participants) contributed to the meta-analysis of the relationship between home-based shared book reading frequency (specific) and expressive vocabulary (specific). The meta-analysis estimated a moderate and significant relationship between frequency of home-based shared book reading and expressive vocabulary [$r = 0.259$, 95% CI = (0.099, 0.419), $p = 0.001$; see [Table 4](#) and [Supplementary Figure 6](#)]. A similar result was found when removing the study with a high risk of bias or SE > 15 (see [Supplementary Table 3](#)).

Discussion

The aim of this systematic review with meta-analyses was to estimate the strength of the relationship between home-based shared book reading and child development. From existing evidence, we predicted small-to-moderate significant relationships between composite and specific measures of each variable. In the sections below, we discuss the main findings of the

meta-analyses, the limitations and provide recommendations for future research.

Home-based shared book reading and child development

We found 28 studies ($N = 24,859$ participants) that reported the strength of the relationship between home-based shared book reading and at least one developmental outcome. These studies used a variety of composite and specific measures of shared book reading (frequency, duration, age of the child when the caregiver commenced reading, number of books in the home) and developmental outcomes (language, vocabulary, receptive vocabulary, expressive vocabulary, cognitive development). In our first meta-analysis, we found a strong relationship between shared book reading and developmental outcomes overall. This average was very similar to estimates produced by meta-analyses of the mean correlation coefficients between any developmental outcome measure (composite or specific) and a composite measure of home-based shared book reading or the specific measure of the frequency of home-based shared book reading. These results show that home-based shared book reading and early child development are related regardless of frequency, duration, or other measures such as number of books in the home. At first glance, this suggests that future research could opt to use any measure of home-based shared book reading. However, this conclusion would be premature for reasons outlined in the limitations and future directions section.

Home-based shared book reading and spoken language

It was interesting to learn from this systematic review that most studies (24 of the 28) that investigated the relationship between home-based shared book reading and child development have focused on spoken language. Spoken language was measured in numerous ways across the included studies. Our analyses revealed a strong relationship between home-based shared book reading and spoken language, which exceeded our prediction of a small-to-moderate relationship. It also exceeded the estimate calculated by Barone et al. (2019) who found a small, yet significant, relationship between home-based shared book reading and a composite measure of language [$d = 0.22$, 95% CI = (0.13, 0.31); $N = 3,556$ participants] in children aged 0–6 years. We also found, for the first time, a strong relationship between home-based shared book reading and vocabulary development. This finding is encouraging given research has shown that vocabulary at age 3 years is a major determinant of school readiness (Camp et al., 2010). This coupled with research showing that children who enter school with a larger vocabulary are more likely to become successful readers in school (Noble et al., 2019) and that language abilities have been shown to be at the core for school success (DeBaryshe, 1995) suggests that shared book reading with children in the early years is important.

Finally, we found a moderately strong relationship between the frequency of home-based shared book reading and expressive vocabulary. This finding appears stronger than the review by Barone et al. (2019) who found a small, yet significant relationship between home-based shared book reading and expressive language [$d = 0.21$, 95% CI = (0.10, 0.29)]. Although this was similar to the review by Dowdall et al. (2020) who found a moderate, significant relationship between home-based shared book reading and expressive language [$N = 2,594$ parent-child dyads; $d = 0.41$, CI = (0.20, 0.61)] in children aged from 1 to 6 years. It is noted that Barone et al. (2019) and Dowdall et al. (2020) included an array of measures for shared book reading and did not specifically assess frequency which may account for the variation in findings.

The positive association between the frequency of shared book reading and expressive vocabulary is important as previous research has shown that expressive vocabulary, i.e., the words a child can produce (Turnbull et al., 2022), is associated with pre-reading skills (Wise et al., 2007), which are predictive of both word reading (Liu et al., 2017) and a child's socioemotional skills (Wirth et al., 2020).

Limitations and future directions

In sum, the results of this systematic review suggest that home-based book reading is probably related to childhood developmental outcomes, related to spoken language in general, and vocabulary most specifically, in children with a mean age <4 years who had not yet started compulsory, formal schooling. When considering the strength of this suggestion, it is important to consider five methodological limitations of this review and the studies that it was able, and unable, to include.

The first limitation was the 12 meta-analyses that we could not conduct due to the lack of studies and/or participants (see meta-analyses section). For example, this systematic review was not in a position to quantitatively evaluate the relationship between home-based shared book reading and cognitive development. Two studies reported home-based shared book reading using a composite outcome, which demonstrated small ($r = 0.17$; Rodriguez et al., 2009) to moderate ($r = 0.29$; Tomopoulos et al., 2006) relationships. Another three studies used a specific measure (i.e., frequency of home-based shared book reading) which showed moderate ($r = 0.259$, $r = 0.24$: Dexter and Stacks, 2014; Tomopoulos et al., 2006,) or large ($r = 0.64$; Li et al., 2021) relationships. These findings suggest that home-based shared book reading may be positively associated with cognitive development, although it is not possible to draw definitive conclusions until there is sufficient data to undertake a meta-analysis.

Another meta-analysis that could not be conducted aimed to look at the relationship between the specific measure of duration of home-based shared book reading and developmental outcomes. Three studies reported small ($r = 0.16$; Farrant and Zubrick, 2011) to moderate positive relationships ($r = 0.23$; Schlesinger et al., 2019, $r = 0.204$; Shen and Del Tufo, 2022) which provides further evidence of the importance of investigating the specific measures of home-based shared book reading and not only composite outcomes. It would be particularly beneficial if future research

could conduct well-powered and high-quality studies investigating the relationship between composite and specific measures of home-based shared book reading and composite and specific measures of developmental outcomes.

However, when evaluating the findings from the meta-analyses that could be undertaken ($N = 6$), the composite measures of home-based shared book reading tended to produce similar relationships with child development outcomes to the specific frequency measure. On the one hand, this may recommend the use of a composite measure over frequency as a more sensitive measure which aligns with previous shared book reading research (Payne et al., 1994). Given that composite measures index multiple aspects of shared book reading at the same time, this may well be true. However, this sensitivity comes at the cost of specificity because it is not possible to determine which aspects of shared book reading may be contributing most to the outcomes. This conundrum suggests that future research choose measures of shared book reading that best address the aims of each study. If the choice is not clear, we suggest a parsimonious approach whereby a composite measure is used as a more sensitive “screening” of shared book reading, and more specific measures of frequency, number of books and duration are used to understand if some aspects of shared book reading are more important than others. It is noted that although Payne et al. (1994) recommends the use of composite outcomes it is important that they are aggregated appropriately. The conceptualization of applying a composite outcome to measures of shared book reading generally assumes that each specific component contributes equally to the overall value (Burgess et al., 2002). We recommend further statistical investigation on large sample sizes to determine which specific components contribute to child development and how they could be combined to produce a reliable composite outcome.

Another limitation for this research was our inability to test our prediction of a moderate and significant relationship between shared book reading and emerging literacy skills. Only one study investigated the relationship between home-based shared book reading and emerging literacy skills in children with a mean age <4 years, which points to a significant gap in our knowledge that needs filling. Given previous research has shown that shared book reading is an important contributor to a child's emerging literacy skills (Celano et al., 1998; Mascarenhas et al., 2017; Sinclair et al., 2018) we recommend research in this area. Further to this, no studies were identified that investigated socioemotional skills. Therefore, we were unable to undertake any meta-analyses on this area suggesting another significant gap in knowledge that also needs filling, especially as research has shown that a child's early language is an important predictor of their socioemotional skills (Wirth et al., 2020).

The third limitation was that although the inclusion criteria for the 6 meta-analyses conducted in this research was met (i.e., at least 5 studies and 783 participants), and the sensitivity analyses did not change the overall estimated mean, the variability in sample sizes between studies was notably high (composite: $N = 44-6,050$; frequency: $N = 28-4,109$). Given the importance of statistical power, we suggest that future studies that investigate shared book reading use an adequate sample size to avoid adding further noise to the data.

A fourth limitation of this review was our inability to determine if children were receiving any formal pre-school education during a study. The majority of studies (15/28; 54%) did not report on preschool attendance. The remaining 13 studies reported that (1) no children were attending any formal education (four studies; 14%); (2) some children may have been attending preschool (two studies; 7%) or early intervention programs, community programs or preschool (seven studies; 25%). We recommend that future research on shared book reading include information about whether participating children are attending preschools that provide instruction in reading-related skills.

The final limitation of this research was the high heterogeneity of the results in the meta-analyses which raises concerns around the conclusion of the relationships. One could assume that the largest studies would be producing the largest effect, however this was not always the case as can be seen when a composite measure was used for shared book reading and the relationship with vocabulary. Providing a precise estimate is dependent on the interaction between the nature of the measure being used for the outcome and the number of participants—the more precise the outcome measure, the more precise the relationship.

Notably, although this review did not consider demographic factors such as socioeconomic status (SES) in the meta-analyses, we investigated this variable across the 28 manuscripts included. The majority of studies (15/28; 54%) either did not mention SES or recognized it as a variable of interest but did not consider it within the analysis. The remaining 13 studies (46%) did include SES as a variable of interest with the majority (10/13; 77%) demonstrating an association with the home literacy environment or child developmental outcomes. Given this, it would suggest that SES is an important factor in this field and recommend that future research on shared book reading include information about the socio-economic status of participating caregivers both in reporting and analysis.

We recommend the following steps for future research into shared book reading: (a) large sample sizes, (b) apply the clear outline of how to measure and report shared book reading as mentioned previously, (c) small age ranges with schooling specified if applicable as well as socioeconomic status and (d) precise developmental outcome measures.

Conclusion

This systematic review with meta-analyses investigates the relationship between home-based shared book reading (composite or specific) and developmental outcomes (composite or specific) in children with a mean age <4 years. It included 28 studies with a total sample size of 24,859 children. The results of a series of meta-analyses suggest that home-based shared book reading is probably related to developmental outcomes overall (strong relationship), language, (strong relationship), and vocabulary (strong relationship). This pattern of findings indicated that home-based shared book reading measured as either a composite variable or frequency is related to various developmental outcomes in young children—particularly their spoken language skills.

Author contributions

CG: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Validation, Visualization, Writing – original draft, Writing – review & editing. AJ: Investigation, Writing – original draft, Data curation. KK: Investigation, Writing – original draft, Data curation. AS: Investigation, Writing – original draft, Data curation. SR: Formal analysis, Investigation, Methodology, Writing – review & editing, Visualization. CN: Supervision, Writing – original draft. GM: Conceptualization, Supervision, Writing – original draft, Writing – review & editing, Methodology, Visualization.

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References

- Attig, M., and Weinert, S. (2020). What impacts early language skills? Effects of social disparities and different process characteristics of the home learning environment in the first 2 years. *Front. Psychol.* 11:557751. doi: 10.3389/fpsyg.2020.557751
- Barone, C., Chambuleyron, E., Vonnak, R., and Assirelli, G. (2019). Home-based shared book reading interventions and children's language skills: a meta-analysis of randomised controlled trials. *Educ. Res. Eval.* 25, 270–298. doi: 10.1080/13803611.2020.1814820
- Bills, K. L., and Mills, B. (2022). Limitations when conducting quantitative disability research. *J. Res. Initiat.* 6:10. Available online at: <https://digitalcommons.unccsu.edu/jri/vol6/iss2/10>
- Bracken, S. S., and Fischel, J. E. (2008). Family reading behavior and early literacy skills in preschool children from low-income backgrounds. *Early Educ. Dev.* 19, 45–67. doi: 10.1080/10409280701838835
- Brown, M. I., Westerveld, M. F., Trembath, D., and Gillon, G. T. (2018). Promoting language and social communication development in babies through an early storybook reading intervention. *Int. J. Speech Lang. Pathol.* 20, 337–349. doi: 10.1080/17549507.2017.1406988
- Burgess, S. R., Hecht, S. A., and Lonigan, C. J. (2002). Relations of the home literacy environment (HLE) to the development of reading-related abilities: a one-year longitudinal study. *Read. Res. Q.* 37, 408–426. doi: 10.1598/RRQ.37.4.4
- Camp, B. W., Cunningham, M., and Berman, S. (2010). Relationship between the cognitive environment and vocabulary development during the second year of life. *Arch. Pediatr. Adolesc. Med.* 164, 950–956. doi: 10.1001/archpediatrics.2010.169
- Celano, M., Hazzard, A., McFadden-Garden, T., and Swaby-Ellis, D. (1998). Promoting emergent literacy in a pediatric clinic: predictors of parent-child reading. *Childrens Health Care* 27, 171–183. doi: 10.1207/s15326888chc2703_3
- Chen, J. J., and Ren, Y. (2019). Relationships between home-related factors and bilingual abilities: a study of Chinese-English dual language learners from immigrant, low-income backgrounds. *Early Childh. Educ. J.* 47, 381–393. doi: 10.1007/s10643-019-00941-9
- Cohen, J. (1998). *Statistical Power Analysis for the Behavioural Sciences*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Crosh, C. C., Barsella, A., Van Slambrouck, L., Notario, P. M., Li, Y., Parsons, A. A., et al. (2022). Exploratory mixed-methods study of a primary care-based intervention promoting shared reading during infancy. *Clin. Pediatr.* 61, 475–484. doi: 10.1177/00099228221085825
- de Bondt, M., Willenberg, A. G., and Bus, I. A. (2020). Do book giveaway programs promote the home literacy environment and children's literacy-related behavior and skills? *Rev. Educ. Res.* 90, 349–375. doi: 10.3102/0034654320922140
- DeBaryshe, B. D. (1993). Joint picture-book reading correlates of early oral language skill. *J. Child Lang.* 20, 455–461. doi: 10.1017/S0305000900008370
- DeBaryshe, B. D. (1995). Maternal belief systems: Linchpin in the home reading process. *J. Appl. Dev. Psychol.* 16, 1–20. doi: 10.1016/0193-3973(95)90013-6
- Deckner, D. F., Adamson, L. B., and Bakeman, R. (2006). Child and maternal contributions to shared reading: effects on language and literacy development. *J. Appl. Dev. Psychol.* 27, 31–41. doi: 10.1016/j.appdev.2005.12.001
- Desjardin, J. L., Stika, C. J., Eisenberg, L. S., Johnson, K. C., Hammes Ganguly, D. M., Henning, S. C., et al. (2017). A longitudinal investigation of the home literacy environment and shared book reading in young children with hearing loss. *Ear Hear.* 38, 441–454. doi: 10.1097/AUD.0000000000000414
- Dexter, C. A., and Stacks, A. M. (2014). A preliminary investigation of the relationship between parenting, parent-child shared reading practices, and child development in low-income families. *J. Res. Child. Educ.* 28, 394–410. doi: 10.1080/02568543.2014.913278
- Dicataldo, R., and Roch, M. (2022). How does toddlers' engagement in literacy activities influence their language abilities? *Int. J. Environ. Res. Public Health* 19:526. doi: 10.3390/ijerph19010526
- Dowdall, N., Melendez-Torres, G. J., Murray, L., Gardner, F., Hartford, L., and Cooper, P. J. (2020). Shared picture book reading interventions for child language

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declare that no Gen AI was used in the creation of this manuscript.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/flang.2025.1540562/full#supplementary-material>

- development: a systematic review and meta-analysis. *Child Dev.* 91, e383–e399. doi: 10.1111/cdev.13225
- Dunn, L. M., and Dunn, D. M. (2007). *Peabody Picture Vocabulary Test—Fourth Edition (PPVT-4) [Database record]*. Minneapolis, MN: Pearson Assessments. doi: 10.1037/t15144-000
- Duursma, E. (2014). The effects of fathers' and mothers' reading to their children on language outcomes of children participating in early head start in the United States. *Fathering* 12, 283–302. doi: 10.3149/fth.1203.283
- Duursma, E., and Pan, B. A. (2011). Who's reading to children in low-income families? The influence of paternal, maternal and child characteristics. *Early Child Dev. Care* 181, 1163–1180. doi: 10.1080/03004430.2010.520161
- Duursma, E., Pan, B. A., and Raikes, H. (2008). Predictors and outcomes of low-income fathers' reading with their toddlers. *Early Child. Res. Q.* 23, 351–365. doi: 10.1016/j.ecresq.2008.06.001
- Edwards, S., and Reynell, J. (1997). *Reynell Developmental Language Scales 3 (University of Reading ed.)*. Berkshire: NFER-Nelson Health and Social Care.
- Egger, M., Davey Smith, G., Schneider, M., and Minder, C. (1997). Bias in meta-analysis detected by a simple, graphical test. *BMJ* 315, 629–634. doi: 10.1136/bmj.315.7109.629
- Farrant, B. M., and Zubrick, S. R. (2011). Early vocabulary development: the importance of joint attention and parent-child book reading. *First Lang.* 32, 343–364. doi: 10.1177/0142723711422626
- Fekonja-Pekljaj, U., Marjanovič-Umek, L., and Sočan, G. (2015). Home environment as a predictor of child's language: a mediating role of family literacy activities and symbolic play. *Psiholoska Obzorja* 24, 1–12. doi: 10.20419/2015.24.421
- Fenson, L., Marchman, V. A., Thal, D. J., Dale, P. S., Reznick, J. S., Bates, E., et al. (2006). *MacArthur-Bates Communicative Development Inventories, Second Edition (CDIs) [Database record]*. Baltimore, MD: Brookes Publishing Co. doi: 10.1037/t11538-000
- Fletcher, K. L., Cross, J. R., Tanney, A. L., Schneider, M., and Finch, W. H. (2008). Predicting language development in children at risk: the effects of quality and frequency of caregiver reading. *Early Educ. Dev.* 19, 89–111. doi: 10.1080/10409280701839106
- Francis, D. A., Caruana, N., Hudson, J. L., and McArthur, G. M. (2019). The association between poor reading and internalising problems: a systematic review and meta-analysis. *Clin. Psychol. Rev.* 67, 45–60. doi: 10.1016/j.cpr.2018.09.002
- Funder, D. C., and Ozer, D. J. (2019). Evaluating effect size in psychological research: sense and nonsense. *Adv. Methods Pract. Psychol. Sci.* 2, 156–168. doi: 10.1177/2515245919847202
- Gignac, G. E., and Szodorai, E. T. (2016). Effect size guidelines for individual differences researchers. *Pers. Individ. Dif.* 102, 74–78. doi: 10.1016/j.paid.2016.06.069
- Glenton, C., Santesso, N., Rosenbaum, S., Nilsen, E. S., Rader, T., Ciapponi, A., et al. (2010). Presenting the results of cochrane systematic reviews to a consumer audience: a qualitative study. *Med. Decis. Making* 30, 566–577. doi: 10.1177/0272989X10375853
- Grimm, H., Aktaş, M., and Frevert, S. (2010). *SETK 3–5 Sprachentwicklungstest für drei- bis fünfjährige Kinder: Diagnose von Sprachverarbeitungsfähigkeiten und auditiven Gedächtnisleistungen [SETK 3–5 language development test for three- to five-year-old children: Diagnosis of language processing ability and auditory memory]*, 2nd revised Edn. Hogrefe. Available online at: <https://dorsch.hogrefe.com/stichwort/sprachentwicklungstest-fuer-drei-bis-fuenfjaehrige-kinder-setk-3-5>
- Grimm, H., and Doil, H. (2006). *ELFRA-Elternfragebögen für die Früherkennung von Risikokindern*, 2nd Edn. Göttingen: Hogrefe.
- Huebner, C. E. (2000). Community-based support for preschool readiness among children in poverty. *J. Educ. Stud. Placed Risk* 5, 291–314. doi: 10.1207/S15327671ESPR0503_6
- Jimenez, M. E., Reichman, N. E., Mitchell, C., Schnepfer, L., McLanahan, S., Notterman, D. A., et al. (2020). Shared reading at age 1 year and later vocabulary: a gene–environment study. *J. Pediatr.* 216, 189–196. doi: 10.1016/j.jpeds.2019.07.008
- Karousou, A., and Economacou, D. (2024). Quantity and quality of book reading to infants and toddlers: Their effect on early communication and language development. *Psychology* 29, 1–27. doi: 10.12681/psy_hps.34486
- Karrass, J., and 22222222sBraungart-Rieker, J. M. (2005). Effects of shared parent-infant book reading on early language acquisition. *J. Appl. Dev. Psychol.* 26, 133–148. doi: 10.1016/j.appdev.2004.12.003
- Kim, S., Im, H., and Kwon, K.-A. (2015). The role of home literacy environment in toddlerhood in development of vocabulary and decoding skills. *Child Youth Care Forum* 44, 835–852. doi: 10.1007/s10566-015-9309-y
- Leech, K. A., McNally, S., Daly, M., and Corriveau, K. H. (2022). Unique effects of book-reading at 9-months on vocabulary development at 36-months: insights from a nationally representative sample of Irish families. *Early Child. Res. Q.* 58, 242–253. doi: 10.1016/j.ecresq.2021.09.009
- Li, R., Rose, N., Zheng, Y. M., Chen, Y., Sylvia, S., Wilson-Smith, H., et al. (2021). Early childhood reading in rural China and obstacles to caregiver investment in young children: a mixed-methods analysis. *Int. J. Environ. Res. Public Health* 18:1457. doi: 10.3390/ijerph18041457
- Liu, Y., Yeung, S. S., Lin, D., and Wong, R. K. S. (2017). English expressive vocabulary growth and its unique role in predicting English word reading: a longitudinal study involving Hong Kong Chinese ESL children. *Contemp. Educ. Psychol.* 49, 195–202. doi: 10.1016/j.cedpsych.2017.02.001
- Lyytinen, P., Laakso, M.-L., and Poikkeus, A.-M. (1998). Parental contribution to child's early language and interest in books. *Eur. J. Psychol. Educ.* 13, 297–308. doi: 10.1007/BF03172946
- Malhi, P., Menon, J., Bharti, B., and Sidhu, M. (2018). Cognitive development of toddlers: does parental stimulation matter? *Indian J. Pediatr.* 85, 498–503. doi: 10.1007/s12098-018-2613-4
- Marjanovič-Umek, L., Fekonja-Pekljaj, U., Podlesk, A., Kranjc, S., and Bajc, K. (2008). *Lestvice splošnega govornega razvoja – LJ [Scales of General Language Development – LJ]*. Ljubljana, Slovenia: Center za psihodiagnostična sredstva.
- Marjanovič-Umek, L., Fekonja-Pekljaj, U., and Sočan, G. (2017). Early vocabulary, parental education, and the frequency of shared reading as predictors of toddler's vocabulary and grammar at age 2;7: a Slovenian longitudinal CDI study. *J. Child Lang.* 44, 457–479. doi: 10.1017/S0305000916000167
- Mascarenhas, S. S., Moorakonda, R., Agarwal, P., Lim, S. B., Sensaki, S., Chong, Y. S., et al. (2017). Characteristics and influence of home literacy environment in early childhood-centered literacy orientation. *Proc. Singap. Healthc.* 26, 81–97. doi: 10.1177/2010105816674738
- McElvany, N., Becker, M., and Luedtke, O. (2009). The role of family variables in reading literacy, vocabulary, reading motivation, and reading behavior. *Z. Entwicklungspsychol. Pädagog. Psychol.* 41, 121–131. doi: 10.1026/0049-8637.41.3.121
- Mendelsohn, A. L., da Rosa Picolo, L., Oliveira, J. B. A., Mazzuchelli, D. S. R., Sa Lopes, A., Brockmeyer Cates C., et al. (2020). RCT of a reading aloud intervention in Brazil: do impacts differ depending on parent literacy. *Early Childh. Res. Q.* 53, 601–611. doi: 10.1016/j.ecresq.2020.07.004
- Michalec, D. (2011). “Bayley scales of infant development: third edition,” in *Encyclopedia of Child Behavior and Development*, Vol. 1, S. Goldstein, and J. A. Naglieri (Cham: Springer), 215. doi: 10.1007/978-0-387-79061-9_295
- Murray, A., and Egan, S. M. (2014). Does reading to infants benefit their cognitive development at 9-months-old? An investigation using a large birth cohort survey. *Child Lang. Teach. Ther.* 30, 303–315. doi: 10.1177/0265659013513813
- Myung, S.-K. (2023). How to review and assess a systematic review and meta-analysis article: a methodological study (secondary publication). *J. Educ. Eval. Health Prof.* 20, 24–40. doi: 10.3352/jeehp.2023.20.24
- Niklas, F., Wirth, A., Guffler, S., Drescher, N., and Ehlig, S. C. (2020). The home literacy environment as a mediator between parental attitudes toward shared reading and children's linguistic competencies. *Front. Psychol.* 11:1628. doi: 10.3389/fpsyg.2020.01628
- Noble, C., Sala, G., Peter, M., Lingwood, J., Rowland, C., Gobet, F., and Pine, J. (2019). The impact of shared book reading on children's language skills: a meta-analysis. *Educ. Res. Rev.* 28:100290. doi: 10.1016/j.edurev.2019.100290
- O'Farrelly, C., Doyle, O., Victory, G., and Palamaro-Munsell, E. (2018). Shared reading in infancy and later development: evidence from an early intervention. *J. Appl. Dev. Psychol.* 54, 69–83. doi: 10.1016/j.appdev.2017.12.001
- Ong'ayi, D. M. M., Yildirim, E. D., Roopnarine, J. L. (2020). Fathers', mothers', and other household members' involvement in reading, storytelling, and play and preschoolers' literacy skills in Kenya. *Early Educ. Dev.* 31, 442–454. doi: 10.1080/10409289.2019.1669125
- Paulson, J. F., Keefe, H. A., and Leiferman, J. A. (2009). Early parental depression and child language development. *J. Child Psychol. Psychiatry* 50, 254–262. doi: 10.1111/j.1469-7610.2008.01973.x
- Payne, A. C., Whitehurst, G. J., and Angell, A. L. (1994). The role of home literacy environment in the development of language ability in preschool children from low-income families. *Early Child. Res. Q.* 9, 427–440. doi: 10.1016/0885-2006(94)90018-3
- Richman, W. A., and Colombo, J. (2007). Joint book reading in the second year and vocabulary outcomes. *J. Res. Child. Educ.* 21, 242–253. doi: 10.1080/02568540709594592
- Roberts, J., Jurgens, J., and Burchinal, M. (2005). The role of home literacy practices in preschool children's language and emergent literacy skills. *J. Speech Lang. Hear. Res.* 48, 345–359. doi: 10.1044/1092-4388(2005/024)
- Rodriguez, E. T., Tamis-LeMonda, C. S., Spellmann, M. E., Pan, B. A., Raikes, H., Lugo-Gil, J., et al. (2009). The formative role of home literacy experiences across the first three years of life in children from low-income families. *J. Appl. Dev. Psychol.* 30, 677–694. doi: 10.1016/j.appdev.2009.01.003
- Rose, E., Lehl, S., Ebert, S., and Weinert, S. (2018). Long-term relations between children's language, the home literacy environment, and socioemotional development from ages 3 to 8. *Early Educ. Dev.* 29, 342–356. doi: 10.1080/10409289.2017.1409096
- Schlesinger, M. A., Flynn, R. M., and Richert, R. A. (2019). Do parents care about TV? How parent factors mediate US children's media exposure and receptive vocabulary. *J. Child. Media* 13, 395–414. doi: 10.1080/17482798.2019.1627227

- Schmitt, S. A., Simpson, A. M., and Friend, M. (2011). A longitudinal assessment of the home literacy environment and early language. *Infant Child Dev.* 20, 409–431. doi: 10.1002/icd.733
- Sénéchal, M., and Young, L. (2008). The effect of family literacy interventions on children's acquisition of reading from kindergarten to Grade 3: a meta-analytic review. *Rev. Educ. Res.* 78, 880–907. doi: 10.3102/0034654308320319
- Shamseer, L., Moher, D., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., et al. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. *BMJ* 349:g7647. doi: 10.1136/bmj.g7647
- Sharif, I., Rieber, S., and Ozuah, P. O. (2002). Exposure to reach out and read and vocabulary outcomes in inner city preschoolers. *J. Natl. Med. Assoc.* 94, 171–177.
- Shen, Y., and Del Tufo, S. N. (2022). Parent-child shared book reading mediates the impact of socioeconomic status on heritage language learners' emergent literacy. *Early Child. Res. Q.* 59, 254–264. doi: 10.1016/j.ecresq.2021.12.003
- Sinclair, E. M., McCleery, E. J., Koepsell, L., Zuckerman, K. E., and Stevenson, E. B. (2018). Home literacy environment and shared reading in the newborn period. *J. Dev. Behav. Pediatr.* 39, 66–71. doi: 10.1097/DBP.0000000000000521
- Teepe, R. C., Molenaar, I., Oostdam, R., Fukkink, R., and Verhoeven, L. (2017). Children's executive and social functioning and family context as predictors of preschool vocabulary. *Learn. Individ. Differ.* 57, 1–8. doi: 10.1016/j.lindif.2017.05.012
- Tomopoulos, S., Dreyer, B. P., Tamis-LeMonda, C., Flynn, V., Rovira, I., Tineo, W., et al. (2006). Books, toys, parent-child interaction, and development in young Latino children. *Ambul. Pediatr.* 6, 72–78. doi: 10.1016/j.ambp.2005.10.001
- Torppa, M., Vasalampi, K., Eklund, K., Niemi, P. (2022). Long-term effects of the home literacy environment on reading development: Familial risk for dyslexia as a moderator. *J. Exp. Child Psychol.* 215:105314. doi: 10.1016/j.jecp.2021.105314
- Tufanaru, C., Munn, Z., Stephenson, M., and Aromataris, E. (2015). Fixed or random effects meta-analysis? Common methodological issues in systematic reviews of effectiveness. *JBIM Evid. Implement.* 13, 196–207. doi: 10.1097/XEB.0000000000000065
- Turnbull, K. L. P., Mateus, D. M. C., LoCasale-Crouch, J., Coolman, F. L., Hirt, S. E., and Okezie, E. (2022). Family routines and practices that support the school readiness of young children living in poverty. *Early Child. Res. Q.* 58, 1–13. doi: 10.1016/j.ecresq.2021.07.004
- Wells, G. A., Shea, B., O'Connell, D., Peterson, J., Welch, V., Losos, M., and Tugwell, P. (2000). The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomised studies in meta-analyses.
- Westerlund, M., and Lagerberg, D. (2007). Expressive vocabulary in 18-month-old children in relation to demographic factors, mother and child characteristics, communication style and shared reading. *Child Care Health Dev.* 34, 257–266. doi: 10.1111/j.1365-2214.2007.00801.x
- Williams, K. T. (1997). *Expressive Vocabulary Test*. Washington, DC: American Guidance Service.
- Wirth, A., Ehlig, S. C., Drescher, N., Guffler, S., and Niklas, F. (2020). Facets of the early home literacy environment and children's linguistic and socioemotional competencies. *Early Educ. Dev.* 31, 892–909. doi: 10.1080/10409289.2019.1706826
- Wise, J. C., Sevcik, R. A., Morris, R. D., Lovett, M. W., and Wolf, M. (2007). The relationship among receptive and expressive vocabulary, listening comprehension, pre-reading skills, word identification skills, and reading comprehension by children with reading disabilities. *J. Speech Lang. Hear. Res.* 50, 1093–1109. doi: 10.1044/1092-4388(2007/076)
- Yaun, J., Bach, M., Bakke, J., Goedecke, P. J., Baldwin, K. M., Hare, M., et al. (2019). Evaluation of a language and literacy enhancement program. *Clin. Pediatr.* 58, 100–109. doi: 10.1177/0009922818809463
- Zgourou, E., Bratsch-Hines, M., Vernon-Feagans, L. (2020). Home literacy practices in relation to language skills of children living in low-wealth rural communities. *Infant Child Dev.* 30:e2201. doi: 10.1002/icd.2201
- Zimmerman, I. L., Steiner, V. G., and Pond, R. E. (2011). *Preschool Language Scale, Fifth Edition (PLS)* [Database record]. San Antonio, TX: The Psychological Corporation. doi: 10.1037/t15141-000

Cover sheet: Supporting document #3

Imagination Library

Return on investment

May 2025

Introduction and contents

United Way Australia engaged dandolopartners to estimate the return on investment of Dolly Parton’s Imagination Library

Background

United Way Australia (UWA) has been delivering Dolly Parton’s Imagination Library (the Imagination Library) in Australia since 2014, as part of their Ready to Read initiative. Today, the Imagination Library is operating in over 450 locations around Australia.

Scope of the project

UWA engaged dandolopartners (dandolo) to estimate the return on investment of Dolly Parton’s Imagination Library in Australia drawing on new, high quality Australian survey data quantifying the increase in reading frequency of families.

To develop this return on investment, dandolo:

- Analysed UWA survey and program data on the Imagination Library
- Reviewed academic research on the impact and likely economic effects of increased reading frequency
- Developed a methodology to calculate the return on investment of the Imagination Library in which we used 2 studies that enabled us to estimate the predicated impact of shared reading practices on Year 3 NAPLAN scores, and the associated financial benefits to government from higher NAPLAN scores¹

This project followed dandolo’s earlier [Impact Assessment of the Imagination Library](#), completed in 2022.

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¹ Guyonne Kalb and Jan C. van Ours, 'Reading to Young Children: A Head-Start in Life?', Melbourne Institute of Applied Economic and Social Research, The University of Melbourne, 2013 and PwC, 2019; Australian Productivity Commission, 2019

Executive summary

What is Dolly Parton's Imagination Library?

The Imagination Library distributes the gift of a book to families every month to develop a love of reading in children by encouraging shared reading practices from very early ages.

Background

Dolly Parton's Imagination Library program provides free, high-quality books to children from birth until age five, regardless of family income. Founded by Dolly Parton in 1995, the program was inspired by her father's illiteracy and aims to foster a love of reading in young children.

Children enrolled in the program receive age- and culturally-appropriate books delivered directly to their home, potentially receiving up to 60 books over five years. The program operates in five countries: the United States, the United Kingdom, the Republic of Ireland, Canada, and Australia, and has gifted over 200 million books worldwide.

Dolly Parton's Imagination Library in Australia

The program has operated in partnership with United Way Australia since 2014 and is now in over 400 communities across Australia. In 2024, the program sent 445,634 books to children throughout Australia.



The Imagination Library provides families with children aged 0 – 5 the gift of a book in the mail each month, along with guidance on shared reading practices...



...**So that** parents, carer-givers and children increase duration and frequency of shared reading and develop positive attitudes towards reading...



... **And** children establish a love of books and reading as well as develop emerging literacy skills...

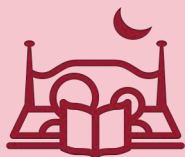


...**Which** increase children's school readiness and academic achievement long-term.

The impact of the Imagination Library in Australia

Families who participated in the program were more likely to have the sustained shared reading routines associated with emerging literacy skills and long-term academic achievement.

A research collaboration between United Way Australia and Macquarie University looked at 86,000 survey responses from participants in the US, Canada, Ireland and Australia and found that participation in the Imagination Library led to...



Established
shared reading
practices in the
home



Emerging literacy
skills leading to
greater school
readiness



Strengthened
connections within
and between
families

Research shows that these impacts were particularly pronounced for lower socio-economic cohorts.¹ For participants in Australia this meant they had a / were...

29% higher chance of being
read to at least four times a
week

Twice as likely to develop
key early literacy skills

38% higher change of
spending more quality time as a
family

¹ The Impact of Shared Book Reading on Children and Families: A Worldwide Study of Dolly Parton's Imagination Library, A research collaboration between United Way Australia and Macquarie University – Summary of Findings for Australia, 2024

Return on investment

We calculated that the Imagination Library returns about 10 times the amount it costs to deliver. We based this on survey data collected by UWA and analysed by Macquarie University¹ and what we know about the benefits to government from an increase in NAPLAN scores.



We know that children who are read to more frequently have higher NAPLAN scores...



... and we know that there is a financial benefit to government from higher NAPLAN scores (due to tax gained on higher earnings and lower welfare costs) of about \$2,400



Overall, the Imagination Library has a positive impact on reading frequency over 12 months, according to survey data on 645 participating families.



Based on the extent to which children increased their reading frequency, we estimated the program would contribute to a combined increase in NAPLAN score points of 3,754 for these families.



Given the expected NAPLAN increase from the program and the fact that it costs \$100 to deliver per child each year, we calculated a return on investment of 1:10.

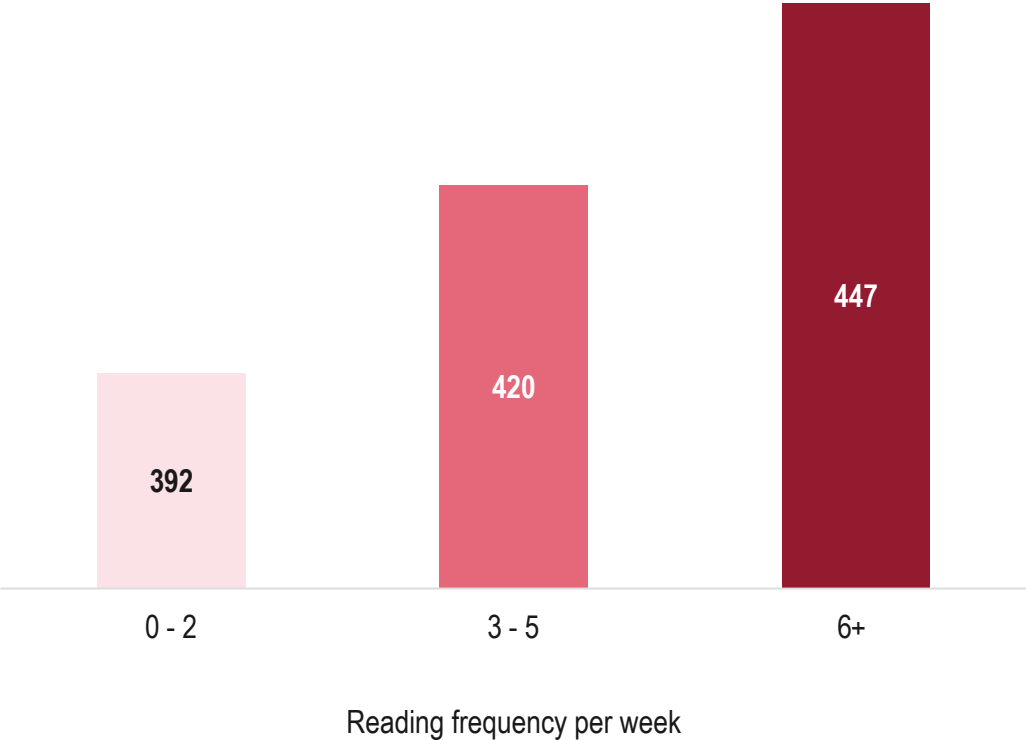
¹ The Impact of Shared Book Reading on Children and Families: A Worldwide Study of Dolly Parton's Imagination Library, A research collaboration between United Way Australia and Macquarie University – Summary of Findings for Australia, 2024

Methodology

Impact of shared reading on school achievement

We know that children who are read to more frequently have higher Year 3 NAPLAN scores.

Average reading NAPLAN score depending on the number of times per week children aged 4-5 participate in shared reading.¹

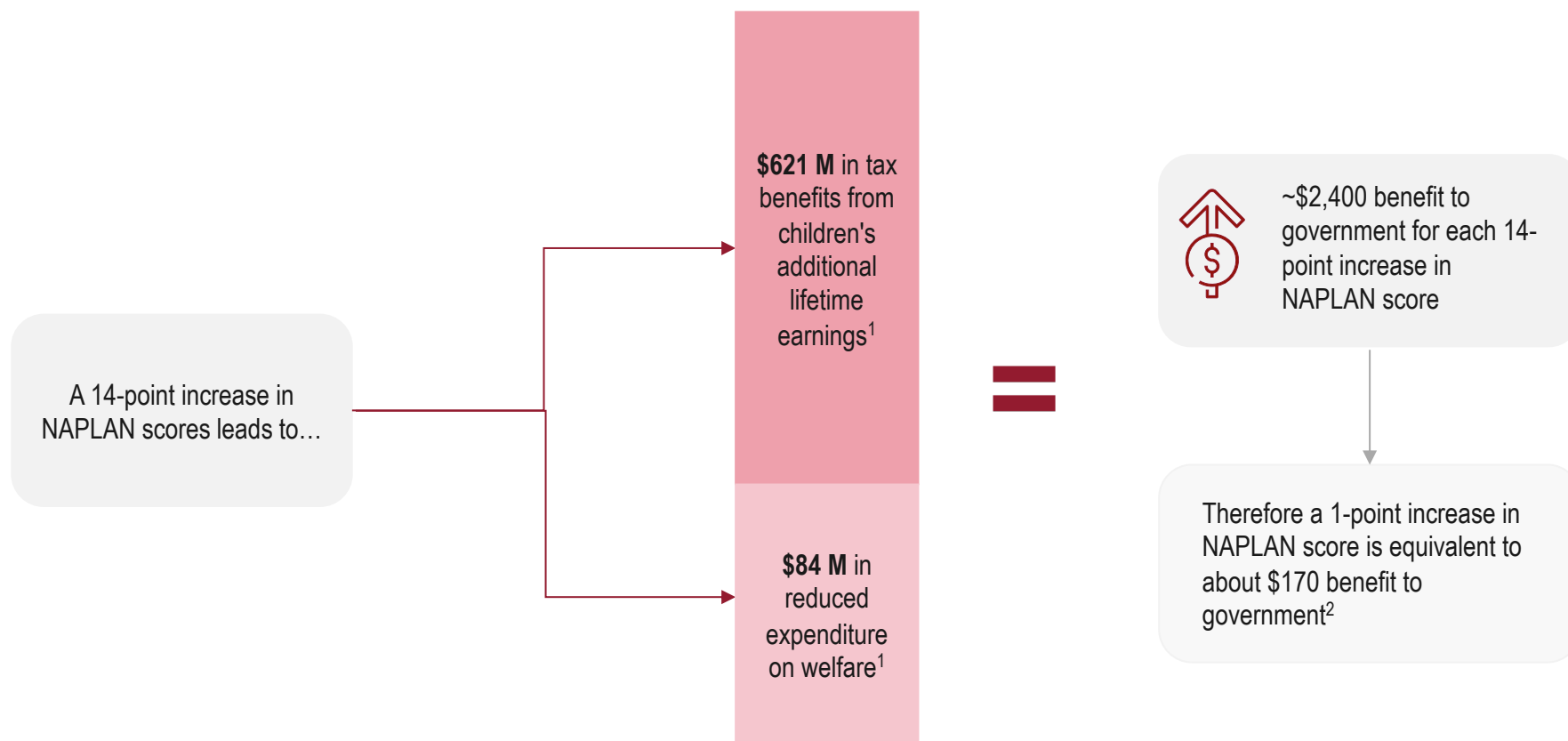


A study conducted by the University of Melbourne showed the average Year 3 NAPLAN reading scores for children depending on the number of times they were read to per week at ages 4-5. This was done using longitudinal data that linked reading frequency for a particular age group to later NAPLAN performance.¹

¹ Guyonne Kalb and Jan C. van Ours, 'Reading to Young Children: A Head-Start in Life?', Melbourne Institute of Applied Economic and Social Research, The University of Melbourne, 2013

Financial benefit to government

We also know that there is a financial benefit to government from higher NAPLAN scores as a result of higher tax from increased earnings over the child's life and lower unemployment. This is around \$170 per each 1-point increase in NAPLAN score.

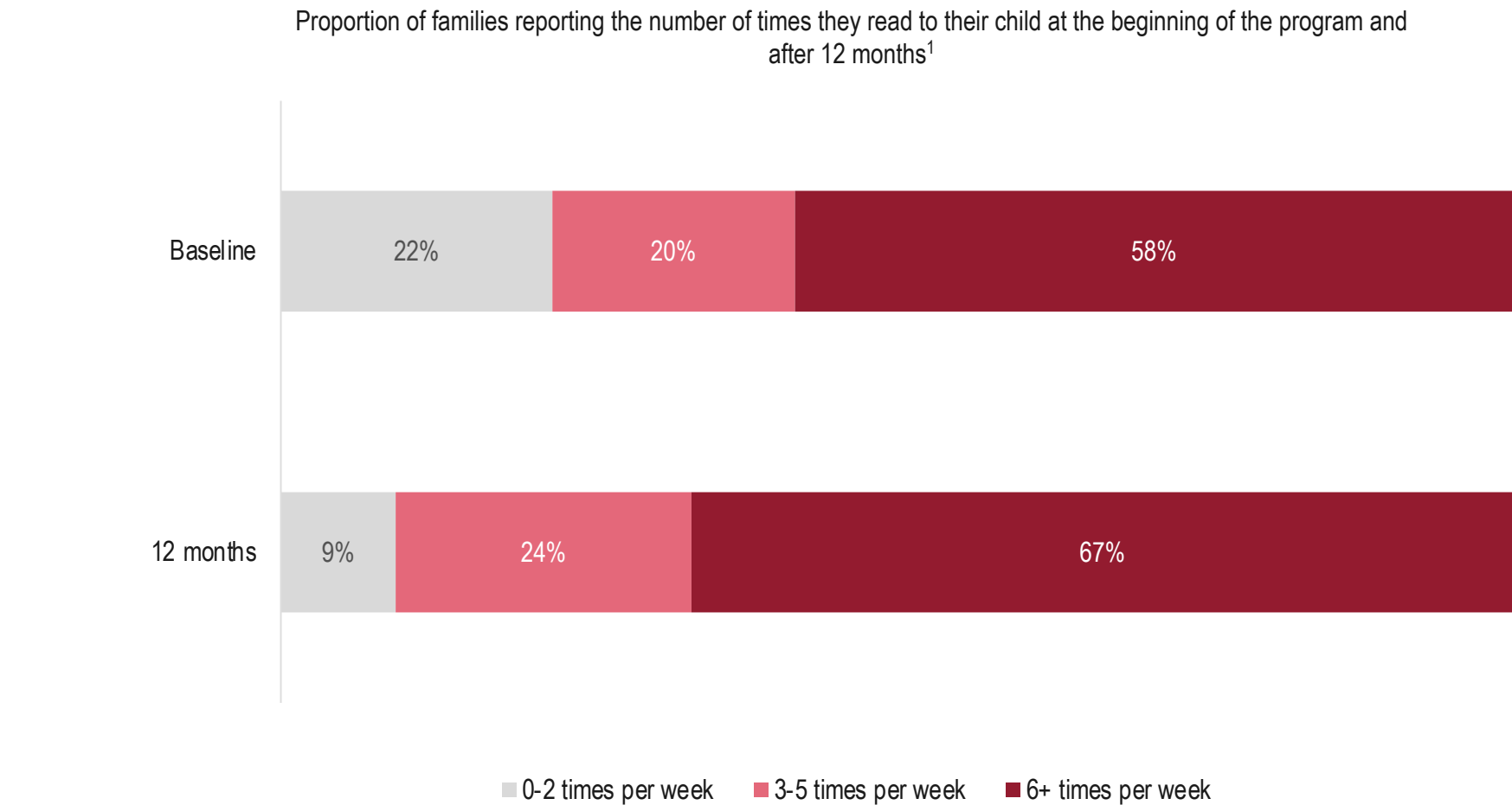


¹ PwC, 2019; Australian Productivity Commission, 2019. Original figures from PwC analysis adjusted for inflation. In this study PwC calculated the financial benefit to government, as well as other stakeholders, from provision of 1 year of early childhood education. PwC showed that an increase in NAPLAN scores that lead to higher levels of educational attainment created a range of benefits for children throughout their life from which there are cost savings to government.

² Of all the cost benefits that PwC linked to increased NAPLAN scores we only included tax benefits from children's additional lifetime earnings and reduced expenditure on welfare. This was because we wanted to estimate the financial benefits when children experienced any increase in NAPLAN scores, more or less than 14-points. We assumed that an increase in NAPLAN scores would increase tax benefits and welfare savings in a linear way, while others may not.

Impact of the Imagination Library on reading frequency

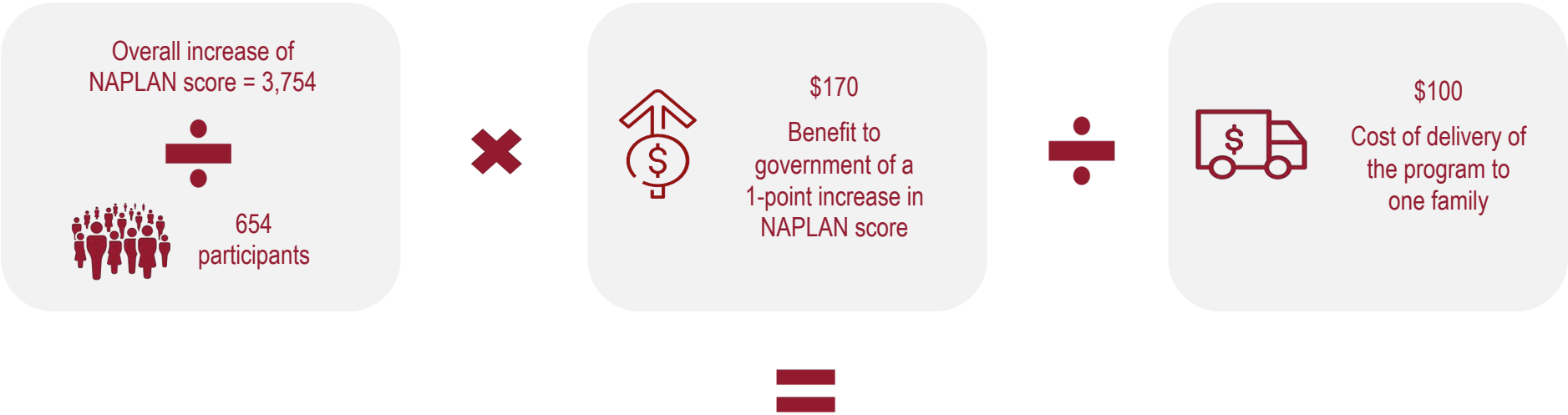
Overall, the Imagination Library has a positive impact on reading frequency for participating families over 12 months, according to survey data.



¹ Survey data included Imagination Library participants in Australia between February 2022 and February 2024 (n=645). Participants were asked 'How often do you read to the child who you are completing the survey about?' at the beginning of the program and again after 12 months.

Return on investment from the Imagination Library

Given the expected increase in NAPLAN scores from the program, and the fact that it costs \$100 to deliver the program per child each year, we calculated a return on investment of 1 to 10.



For every \$100 spent on the program the government receives \$990.¹

This means the program delivers about a 1 to 10 return on investment.

¹ This is likely a conservative estimate because there are other benefits to government from shared reading that are not linked to NAPLAN and because there are other outcomes of the program beyond increased reading frequency that likely generate benefit.

Cover sheet: Supporting document #4



CHECK-UPS BEFORE SCHOOL (CUBS)

FINAL REPORT OF THE PILOT STUDY

23 July 2022

DOI: 10.26183/47e2-fr80

Rebekah Grace, Christine Woodrow,
Christine Johnston, Cheryl Ballantyne

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ABSTRACT

A child's development in the first five years of life has the potential to influence future educational attainment and wellbeing into adulthood. Australia has universal child health and development screening programs available from birth to school entry. However, there are significant issues relating to equitable access, with research demonstrating low levels of uptake in disadvantaged communities. The Check-Ups Before School (CUBS) project sought to redress current inequities within the greater Mt Druitt area of NSW. This initiative was led by The Hive in collaboration with NSW Health and early childhood education and care services. Child and family health nurses (CFHNs) were embedded within local early childhood education and care settings to conduct health and development screening for children in the prior-to-school years.

This report presents an overview and findings from a research study designed to explore the feasibility and impact of the CUBS pilot project. A multi-methods approach was employed, including interviews and focus groups with parents and carers (n=48), community service providers (n=3), and health and educational professionals (n=10). Data from the child health records (n=24) of consenting families were examined to assess local need and referral pathways. Study findings suggest that the location of the CUBS program in familiar early childhood education (ECE) and community settings was effective as a strategy for engaging families. Participants reported that the program was successful in engaging families with health and development screening, building parents' confidence in communicating with healthcare services, and increasing their knowledge about child development and how they can support their own child. Through coordinated cross-disciplinary collaboration, health and education professionals and social workers at The Hive successfully delivered a holistic, place-based service in which relationships with families were built on trust.

As evidence of the success of CUBS, the NSW Government has recently credited the program with informing a new policy to implement 4-year-old health and development check-ups in pre-schools in NSW.

SECTION 1: INTRODUCTION

This report presents an overview and findings from a research project focused on the child, family and service level impacts of the Check-ups Before School (CUBS) pilot project, which operated in pre-schools, child care centres and community hubs within the Mt Druitt (2770) postcode area from 2019 to 2022 (August). The pilot project engaged a child and family health nurse to undertake health and development screening for children in the prior-to-school years, in collaboration with early childhood education and care services. The CUBS implementation team subsequently expanded to include a speech therapist and a social worker. The research project was conducted by a team from the Centre for Transforming early Education and Child Health (TeEACH) at Western Sydney University in collaboration with The Hive during the pilot phase of the CUBS program to explore its impact and inform decision-making with respect to program sustainability and scale-up. This research is described in this report. The report is organised as follows:

BACKGROUND

The CUBS program: Rationale, progress and challenges

The CUBS Program was developed in 2018 through a partnership of social, community and health services in the Mt Druitt area of NSW under the leadership of The Hive. The Hive is a collective impact program established by not-for-profit organisation, United Way Australia, with the primary aim of helping all children within the 2770 (Mt Druitt) postcode area to start school well. Since 2015, The Hive has initiated a range of early childhood initiatives and community activities such as cleaning public spaces, renovating parks and organising school holiday programs and children's days. Collectively, these activities have focused on building trust with local families and strengthening community support for young children and their families.

The CUBS program was designed to directly address a need identified by the Hive: a gap in the information and support available to local families in relation to child health and development in the years immediately preceding the transition to primary school. Families were not accessing the standard development screening program ('Blue Book' screening) delivered by GPs or CFHNs at Child and Family Health Centres, and were consequently missing vital opportunities to engage with early intervention services and identify any areas of concern relating to their children's health and development. Known barriers to family engagement with screening checks included difficulties with transport, fear of accessing health services as the result of past trauma, fear that they will be judged for their parenting, family stressors, and a lack of awareness of the screening program.

Such barriers create a situation in which developmental challenges often remain undetected until children start formal schooling, leading to delays in establishing appropriate support structures. To address this gap, The Hive partnered with the Western Sydney Local Health District to provide a dedicated child and family health nurse (CFHN) who would be embedded within early childhood education and care settings and community centres to conduct health and developmental screening across nine sites in Mt Druitt. It was anticipated that, in addition to facilitating early identification of needs, referral and support for children, CUBS would facilitate the building of relationships of trust and collaboration between families and health and early childhood education professionals. The CUBS program was designed to be relational, integrated, place-based and trauma-informed.

Between August 2019 and March 2020 the pilot program was funded by the NSW Department of Communities and Justice and check-ups were conducted for children aged 3–5 years in pre-schools, child care centres and community hubs in Willmot and Lethbridge Park. As well as checking children's general health and development, the screening included referrals to specialist services for children with identified needs. In addition, for children with identified needs, the health nurse prepared reports for schools to support the planning of individualised teaching and learning programs.

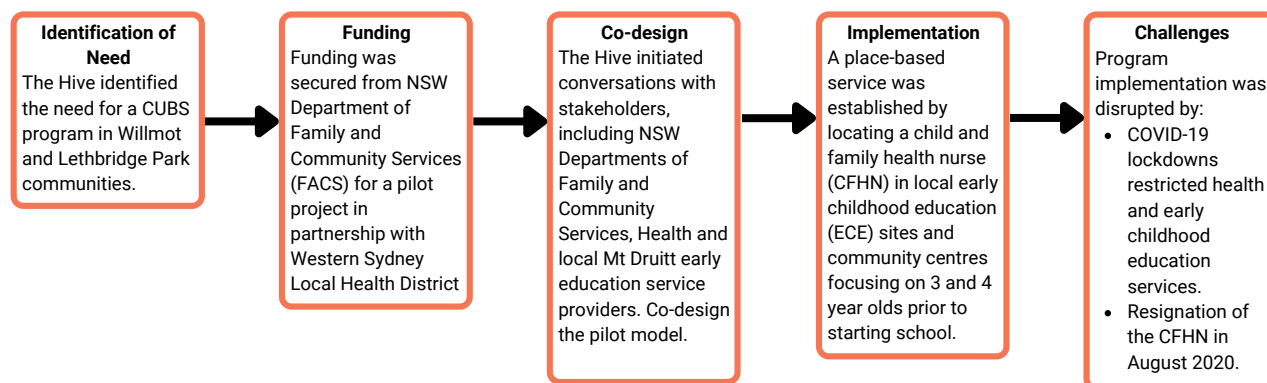
In 2020, COVID-19 disrupted the project. External funding for the pilot ended in mid 2020. From July 2020, the program moved forward relying on existing resources with The Hive and United Way Australia, with a COVID-safe model of screening being implemented in a community site based in the Willmot Community Hub and was advertised for children aged 0–5 to expand the reach of the program and provide an opportunity to identify children's developmental support needs as early as possible. This Community Hub initiative struggled with low rates of uptake, reinforcing the importance of running the CUBS program in early childhood centres where family trust in local early childhood educators was key to engagement with the program.

A small number of traditional check-ups were conducted at Willmot Kids Early Learning Centre in July and August, slowed by COVID lock-downs and illness and isolation within the community. In August the nurse left the role. After a very disrupted year in 2020, CUBS recommenced with additional resources in April 2021. A new CFHN was appointed to conduct check-ups. In addition, a new health linker (social worker) position was established to assist families with following up on referrals made by the CFHN by making appointments with allied health services, accompanying parents to appointments and, in cases where families were experiencing financial difficulties, paying for services. The third member of the expanded CUBS team was a part-time speech pathologist, appointed to provide on-site speech intervention for children in need of additional support, professional learning for Early Childhood Education staff and advice to parents on strategies to assist their children at home.

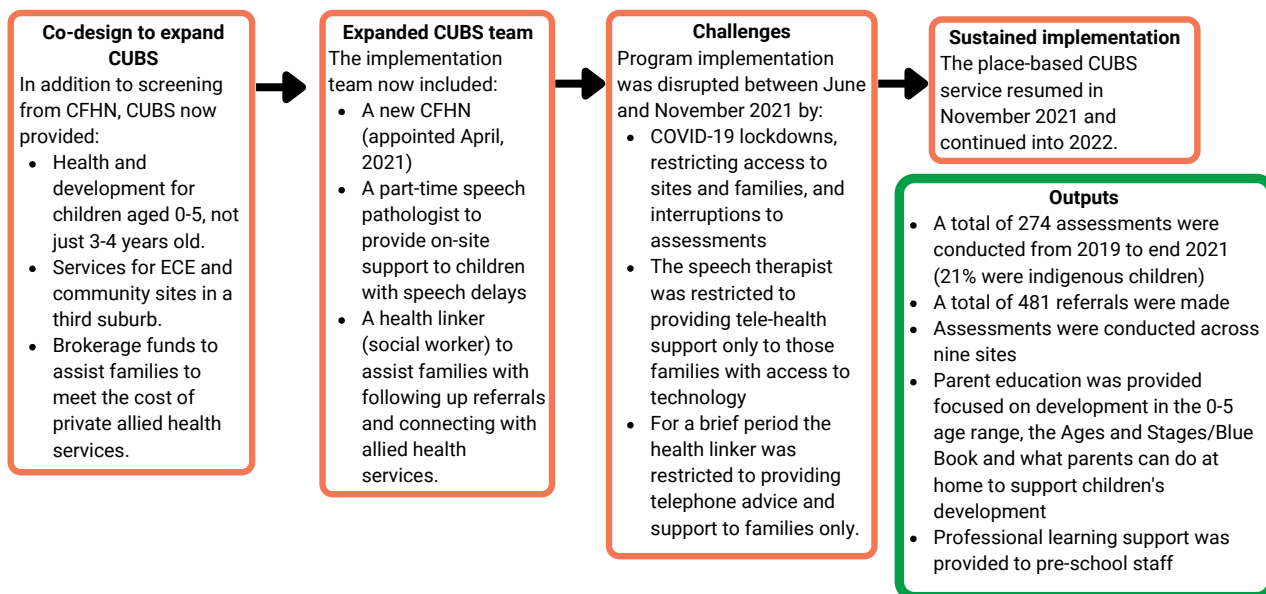
Figure 1 provides a summary of the timelines and outputs of the CUBS pilot project.

Figure 1: CUBS timelines and outputs 2019-2022

2019-2020 Pilot phase 1 (funded by NSW Department of Family and Community Services)



2021-2022 Pilot phase 2: Relaunch with expanded services and team (funded by United Way Australia)





Evaluation of the CUBS program

In 2019, The Hive engaged researchers from TeEACH at Western Sydney University to conduct independent evaluative research to examine the outcomes of CUBS. A pilot study was commissioned to inform decision-making around the value of the program and the potential to scale-up to other communities.

More specifically, this research was guided by the following overarching aims:

- To understand the barriers and facilitators to family participation in early childhood health and development screening programs.
- To examine the extent to which participation in the CUBS program led to early identification of child health and development challenges, family engagement with health and other services, and high levels of parent satisfaction with the supports available to them.
- To explore the impact of the CUBS screening program on school readiness and cross-sector partnerships to support children in the first year of school.

Just as Covid-19 impacted the progress of the CUBS implementation pilot project, the pandemic also resulted in data collection challenges that delayed the progress of the research. Due to restricted access to community and education sites, interviews and surveys had to be redesigned to be conducted by telephone. Engaging participants in the project became more difficult than it might otherwise have been due to community concern related to the pandemic. At-home schooling meant that parents with school-age children had limited time, energy and availability to engage in interviews focused on a CUBS check-up which may have occurred prior to the Covid-19 outbreak.

The process of applying for ethics approval from the Western Sydney Local Health District (WSLHD) to access child health data began in late 2020 and approval was granted in December 2021, followed by site-specific governance approval in March 2022. This timeline complicated data collection by delaying the process of gaining parent consent for access to child health records; consent could not be obtained at the same time as the majority of parent interviews which were conducted in 2020 and 2021, and covered under ethics approval through Western Sydney University and the NSW Department of Education. Obtaining consent by email was difficult due to some parents' limited access to technology, as well as the length and detail of the approved Participant Information and Consent Form (PICF) required by the WSLHD. Telephone as a medium for explaining the research in enough depth to facilitate parents' understanding and their confidence in navigating the PICF also had its limitations. Successful contact with parents to seek consent for access to health records occurred in community centres early in 2022; in some cases at the time of CUBS assessments. The same strategy could not be used during check-ups at government pre-schools due to NSW Department of Education restrictions on the engagement of schools with researchers during the post-pandemic recovery period. The timing and complexity of this component of data collection resulted in a greatly reduced number of children's health records available for analysis, from 100 to 24.

Figure 2 provides a timeline of the evaluation, including milestones and disruptions.

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SECTION 2: LITERATURE REVIEW

A child's development in the first five years of life influences future educational attainment and wellbeing into adulthood (Phair, 2021), with research evidence also linking inequities in health and development to poorer education outcomes (Goldfeld et al., 2014; McLachlan et al., 2013). Furthermore, disengagement with screening processes and high levels of child developmental vulnerability is common across disadvantaged communities in Australia (ABS, 2016; Australian Government 2018) and poses a significant challenge to be addressed if we are to break cycles of intergenerational disadvantage (Australian Government, 2018). However, the meaningful integration of services designed to support children and their families across sectors can assist young children to achieve their developmental potential (Britto et al., 2017).

Australia, like many other developed nations, implements health and development surveillance programs from birth to school entry. These programs involve a “continuous and cumulative process whereby knowledgeable healthcare professionals identify children who may have developmental problems” (Eapen et al., 2014, p. 2). Such programs aim to identify and document health and developmental difficulties, parent concerns, risk and protective factors in the child's early years (Lipkin & Macias, 2020; Goldfeld et al., 2012; Eapen et al., 2014).

In NSW, parents of newborns are provided with a Personal Health Record (PER), known as the ‘Blue Book’, which provides information about early child development milestones and needs, including immunisations and health screening checks administered by a general practitioner (GP) or child and family health nurse (CFHN). Screening checks are recommended at 6 months, 12 months, 18 months, 2 years, 3 years and prior to school entry (NSW Ministry of Health, 2020). As a strategy to address inequities in health, development and education outcomes, this screening initiative has been significantly ineffective in disadvantaged communities because of the low rates of uptake. In addition, there are inconsistencies in both the implementation of and family engagement with developmental surveillance (Eapen et al., 2014; Jose et al., 2020). Barriers

to its effectiveness include long waiting periods for assessment and intervention services, particularly for those children with identified speech and language disorders or global developmental delay (Eapen et al., 2014). In 2014, Eapen and colleagues called for more research on the barriers and enablers to the uptake of developmental surveillance, particularly in areas of socio-economic disadvantage. In essence, research suggests that those children who would be most likely to benefit from screening and early intervention are the least likely to participate in it. The implications for school readiness and growing inequalities are considerable.



The Watch Me Grow (WMG) study, which was conducted in south-western Sydney NSW, aimed to maximise the early identification of children with developmental problems through partnerships among policy makers, service providers and researchers (Eapen et al., 2014). Specifically, the objectives of WMG were to: assess risks for non-completion of regular health screening in early childhood from the perspectives of parents; determine the prevalence of developmental risk in the early years; and assess the diagnostic test accuracy of the NSW surveillance program undertaken by the Parents' Evaluation of Developmental Status (PEDS) (previously included in the Blue Book, but replaced in 2017 by developmental questions for parents under the heading of Learn the Signs. Act Early). A birth cohort of 2,000 children were followed up at 6 months, 12 months and 18 months, with data collected at 18 months compared to a reference standard of data representing all 18 month-old children (Eapen et al., 2014). Qualitative data collected from the WMG study suggested the need for improved communication about health surveillance and the Blue Book for parents from culturally and linguistically diverse (CALD) backgrounds (Garg et al., 2017). The WMG study identified socio-economic disadvantage and culturally and linguistically diverse (CALD) background as factors associated with moderate to high developmental risk (Woolfenden et al., 2016). Study findings also suggested that children with multiple risk factors were more likely to experience developmental vulnerability, and that their developmental vulnerability was less likely to be identified and documented (Ayer, et al. 2020; Woolfenden et al. 2016).



South-western Sydney is a region with a significant CALD population. Approximately 35% of residents have English as a second language, with that proportion increasing to 70% in some locations (Garg et al., 2017). Qualitative data from the WMG study found that parents' limited awareness and understanding of child development and health surveillance, including the purpose of the Blue Book, were key factors in the reduced engagement with primary health care for CALD families. Some acknowledged the importance of the Blue Book as a resource for information and for tracking growth and development. Others said that they relied on their own instinct and family expectations of their child's development, and did not feel the need for regular check-ups with health professionals. Another key factor was the choice of provider, which for some parents was influenced by previous interactions with GPs and CFHNs. Many parents indicated that they attended a GP for all health care needs; this choice was linked to feelings of trust and confidence in the knowledge of the GP as the main health provider. Some participants chose to seek advice from the CFHN, but in general participants were less likely to attend Early Childhood Health Clinics. Shared cultural background and language with health providers was shown to be important for participants (Garg et al., 2017). Finding suitable ways to enable and empower parents from disadvantaged and diverse cultural backgrounds to engage with health professional in the first five years of their child's life is therefore critical.

While identification and follow-up of health and development problems prior to school entry can support the child's transition to school and assist in the planning of appropriate educational programs, many developmental difficulties are not identified until the child starts school (Goldfeld et al., 2012). A study of three successive population cohorts of Australian children identified the prevalence of teacher-identified special health care needs (SHCN) and their distribution across disadvantaged communities (O'Connor et al., 2019). Data were collected through the teacher-rated checklist in the Australian Early Development Census (Australian Government 2018) for children in their first year of schooling in 2009, 2012 and 2015, across government, independent and Catholic education systems. The cohort of 853,123 children represented 96% of

the estimated 5-year old population for each year. The study found that the proportion of children commencing school with either emerging and established needs was generally stable across the three cohorts with 17.1–18.9% identified as having emerging needs and 4.4–4.9% established needs. Furthermore, the study found that the odds of children having SHCN was higher in disadvantaged communities (O'Connor et al., 2019). Health and development screening in the year prior to school entry, therefore, has the potential to identify and support appropriate interventions in the management of problems that may negatively impact on educational performance.

Such an approach is used in New Zealand with a study of prior-to-school health and development screening reporting that uptake has increased each year since 2013 (Richards et al., 2019). The New Zealand before school check-ups (B4SC) are voluntary and offered free of charge to all four-year-old children whose families are enrolled in a primary health organisation (93% of the population is estimated to be enrolled in primary health organisations). The service is provided in different locations according to community accessibility and needs, such as pre-schools, medical practices, community centres, churches and marae (sacred place in Maori culture). Since 2013, over 90% of all eligible four-year-olds have participated each year, and 92% of all eligible children were screened in 2015–16 (Richards et al., 2019). These data demonstrate the importance of an approach that provides support to families in the places in which they feel most comfortable.

Partnerships between health providers, early childhood education and care, and community organisations can thus provide the basis for collaborative models of implementing health and development surveillance. Edwards et al. (2020) reported on an evaluation of developmental surveillance in which CFHNs were located in non-government organisation (NGO) early childhood services alongside early education and care staff and family workers. NGO staff were trained in child development and the use of the PEDS, the NSW Health developmental surveillance tool at the time. Commencing in June 2014, the evaluation utilised a mixed-methods design to identify children from CALD backgrounds at developmental risk and to provide referrals to support services. Data were collected through focus groups, interviews, pre- and post- training surveys, and existing data sets capturing developmental vulnerability and

contact with services. Of the participating 159 children, 39% had one or more predictive concerns on the PEDS, indicating developmental vulnerability and requiring referral and follow-up. Co-location of CFHNs in an NGO setting was identified as an enabler for parents to access developmental assessments. Parents who might have felt reluctant to attend child and family health clinics were introduced to nurses in a safe, familiar environment. The training provided for NGO staff was regarded as key to the success of the model; NGO staff valued the team effort and reported increased confidence arising from their relationship with CFHNs and other health service providers (Edwards et al., 2020). This study demonstrates the potential for improving access to health screening for CALD and vulnerable communities through partnerships between health and early childhood providers.



Practitioners' and policy makers' concerns about vulnerable families' uptake of early childhood services in Tasmania led to the Tassie Kids Project, an investigation conducted by a cross sectoral partnership involving the Departments of Health and Human Services, Education and Premier and Cabinet. Specifically, the project employed an ethnographic research design, gathering data from 43 service providers and 32 parents to investigate families' uptake of early childhood services and how services were engaging with families (Jose et al., 2020). The study found that outreach was a key element in the effective delivery of services to vulnerable families with young children. Defined as the

delivery of service outside the usual location of the service (Wakerman et al., 2008), outreach strategies used in the Tasmanian context included home visits, telephone calls, attending services with parents, providing transport to families without cars and with limited access to public transport, and social media communication. Parents reported positive impacts of support, which they recognised as beyond usual care. The Tassie Kids Project identified effective outreach activities as those informed by the principles of consistency, reliability, flexibility, responsiveness and persistence, and with a clear purpose to engage families, connect them with services and provide support. The study identified structured service delivery models and staff capacity as constraints to the delivery of outreach. Whilst outreach strategies were practiced across all early childhood services, the study found that outreach practice was implicit; policy and practice frameworks lacked guidance on the role of outreach. Jose et al. (2020) concluded that the development of explicit guidelines to clarify the role of outreach for service providers would increase its visibility in facilitating engagement with vulnerable families.

Models that co-locate health and learning services within early childhood education settings and community centres have the potential to identify and address barriers and risks to families' participation as well as protective factors that enhance uptake. For families in disadvantaged communities, supporting protective mechanisms to flourish is arguably the most important work a service organisation can do to set children on a trajectory that will lead to positive outcomes across the lifespan (Hertzman, 2010; Moore, McDonald & McHugh-Dillon, 2014). The success of such service delivery models relies on building and sustaining strong relationships across health, early education and community sectors, as well as with families themselves.

Doveton College Victoria, which opened in 2012, offers an integrated early learning, family support, maternal and child health service for children from birth to age four, as well as teaching and learning spaces to year 9. This place-based, integrated model illustrates how the involvement of many partners with a shared vision “has allowed a well-grounded concept to evolve into the creation of an integrated, wrap-around community-focused school” (McLoughlin & Newman, 2015, p. 10). The three levels of support provided by Doveton College are: funded education on a daily basis for early learning, primary and secondary

cohorts of children; services provided by partner organisations, such as maternal and child health, family support, playgroups and parent support, offered on a sessional or ongoing basis; and services delivered off-site by partners and available to children and families on a referral basis (McLoughlin & Newman, 2015). The Doveton model of early learning provides support to families through on-site maternal and child health services for children from birth to age five (Newman et. al. 2020). This integrated model of health and educational service delivery and social support offers a protective mechanism for families through the years from birth to school and (potentially) beyond.

The effect of the Doveton model on early learning for school readiness and academic achievement has been the subject of research. Newman et. al. (2020) investigated whether students who attended the Doveton early learning program in 2013 demonstrated improved academic outcomes at school entry in 2014, compared with their peers who did not attend the Doveton early learning program. If academic advantage was identified in 2014, the study aimed to determine whether students who had attended Doveton early learning maintained an academic advantage in the subsequent four years of schooling to 2017, compared to students who did not. Participants were 56 students (27 girls and 29 boys) who attended Year 3 at Doveton College in 2017, of whom 75% were born in Australia. Of the total sample, 17 students had attended the Doveton early learning program and 39 had attended early learning elsewhere or not at all. Preliminary findings indicated that students who attended the early learning program at Doveton showed significant academic advantage on entry to school, compared to students who did not. In light of Doveton's wrap-around service model which integrates education with family support and maternal and child health services from birth to age five, and support for parents and community members, the researchers acknowledged that it is difficult to determine which factors may have had the most significant effects. However, the outcomes of this study suggest that improvements identified at school entry may be sustained as children grow, thus contributing to lifelong achievement (Newman et. al., 2020). The success of the Doveton model has been enabled by the strength of relationships amongst partners as well as their commitment to understanding and responding to community needs (McLoughlin & Newman, 2015).

Supporting children in the Mt Druitt area of NSW to start school well is the core focus of the CUBS project, initiated by The Hive. The CUBS project was developed in direct response to a need identified by the Australian Early Development Census (Australian Government, 2018), consultation with families, and concerns raised by local early years partners and school principals. The research described in this report contributes to the existing body of research examining the effectiveness of integrated health and education services in the early years. The findings will inform future health planning, policy and practice in early health and education in disadvantaged communities.



SECTION 3: RESEARCH DESIGN AND METHODOLOGY

A mixed-methods research design was employed, including focus groups, individual interviews, surveys and linkage with health records. An overview of the project design is captured in Table 1.

Table 1: Summary of research and participant numbers

Research Questions	Recruitment	Method / Tools	Participants
Aim 1: Barriers and facilitators to participation in health and developmental screening			
- What are the barriers for families in participating in screening programs? - What are parent views on how families could be better supported to engage with screening programs? - How satisfied are parents with screening programs and other services they access for their child? - What are their key sources of information relating to child health and development?	In 2020 and 2021 all families whose children attended the partnering ECE settings, regardless of whether or not they had participated in CUBS screening, were invited through the centres to participate.	Three parent focus groups	12 parents or carers participated in focus groups
Aim 2: The role and impact of the CUBS program on child and family outcomes			
- What are the health and development support needs of the participating children? - To which medical, allied health and development support services are the children referred? - To what extent do families follow up on the referrals? Do they have a GP that they see regularly to discuss the health and development of their child? - How satisfied are parents with the screening program and other services they access for their child? - What are the key sources of information relating to child health and development for parents? In what ways has the program informed parents, or facilitated greater understanding of their children's developmental needs? - To what extent do parents perceive that the professionals involved in supporting their child (including health, allied health and education professionals) work in a coordinated and coherent way?	All parents whose child received a CUBS assessment in 2020-2022 were invited to participate. Late 2021 and early 2022 (after securing WSLHD HREC approval), parents whose children had CUBS were invited to provide consent for the research team to access their child's CUBS assessment. There were 24 children's health records included from 19 families.	Health, development and referral information: Data Linkage with WSLHD to access CUBS screening data, including ASQ & ASQ-SE and CFHN notes Family experiences and satisfaction: Individual parent interviews and parent completed survey	A total of 51 parents/carers participated in this phase 36 participated in individual interviews. 25/36 also completed the survey, and 4/36 consented to the research team accessing their child's health records. 15 parents/carers gave consent for the research team to access their child's health records only.

Table 1: Summary of research and participant numbers (Continued)

Research Questions	Recruitment	Method / Tools	Participants
Aim 3: Cross-Sector partnerships to support children and parents, and facilitate a smooth transition to school			
• What were the experiences of professionals engaging in cross-disciplinary collaborative work through the CUBS program? Did they observe practice or system change as the result of collaboration? • What are the experiences of educators as this relates to the role of health and developmental screening to support the transition to school? • How was information shared between parents, early childhood and primary school education settings, and health and allied health professionals? • How do parent and professional stakeholders describe the benefits and challenges associated with participation in the CUBS program?	Local service providers, education and allied health professionals who had supported the CUBS pilot were invited to participate. Five children and their families who had participated in the CUBS program and in the family interviews were invited to serve as case studies to explore school	Individual interviews with cross-sector service providers. Case study approach with diverse children and their families to explore the role of CUBS in their school transition.	3 community service providers 3 allied health professionals 7 educators (representing ECE, school principals and kindergarten teachers) 5 parents or carers.

RESEARCH SITES

Data were collected across education and community sites, including three public schools, three early childhood education and care centres, and four community centres.

Demographic data for these suburbs indicate that residents experience the highest levels of disadvantage within the Blacktown Council area (Blacktown City Council, 2016). According to the 2016 census (Australian Bureau of Statistics), English was the only language spoken at home by most families (65%). Samoan, Arabic, Turkish, Tongan, Tagalog and Hindi were the most prevalent first languages in this area (Australian Bureau of Statistics, 2016).

RESEARCH PARTICIPANTS: CHILDREN AND FAMILIES

The total number of participants was 76, comprising 13 education, health and community service professionals. 36 participated in an interview, and of these, 25 also completed the survey. 19 families gave consent for access to their children's health records, for 15 of these it was their only form of research participation. Of the parents and carers who provided consent for access to their children's health records, 15 provided consent for access to a single child's data, while four provided consent for access to more than one child's data.

Parent, family and child demographic data from the survey ($n = 25$) is summarised in Table 2.

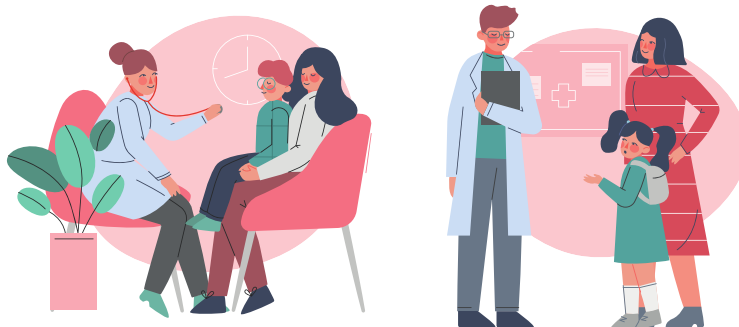


Table 2: Research participants: Children and Families - Parent, family and child demographic data from the survey (n = 25).

Family Variables	Demographic Data
Parent data	
Parents / Caregivers	Mothers: n = 21 Fathers: n = 2 Grandmothers: n = 1 Aunts / Guardians: n = 1
Parent / Caregiver Age	18-25 years: n = 1 26-35 years: n = 15 35-40 years: n = 3 >40 years: n = 6
Parent/Caregiver Highest level of education	< Year 10: n = 1 Year 10: n = 5 Year 11: n = 2 Year 12: n = 7 TAFE certificate / diploma: n = 9 University Bachelors degree: n = 1
Family data	
Number of children in the family	Range: 1 - 6 children Average: 3 children
Family composition	One parent family: n = 14 Two parent family: n = 10 Step-family: n = 1
Cultural background	Non-indigenous Australian: n = 10 Indigenous Australian: n = 7 Other (Tongan, Bangladeshi, French Polynesian, Timorese, Lebanese, Sudanese) n = 8
Language spoken at home	English: n = 19 English plus one other language: n = 5 Languages other than English: n = 1
Access to the internet at home	100%
Child data (for those who had linked health data only)	
Child gender	Female: n = 12 Male: n = 12
Child age	Range: 2 - 6 years old Average: 4 years old

DATA COLLECTION AND ANALYSIS

This section provides a detailed outline of the processes employed to collect and analyse data in each of the three phases (aligned with the three aims) of this study.

PHASE 1: Barriers and facilitators to participation in health and developmental screening

Phase 1 was designed to address the first of the research aims, to understand the barriers and facilitators for families in participating in early childhood health and development screening programs in the year before school. This aim was investigated by collecting data through three community focus groups: one in a local preschool, and two in community settings. The focus groups were all conducted face-to-face, as they occurred prior to Covid-19 lockdowns, and questions are included in Appendix 3. The participants were 12 local parents with children aged under five years. The parents represented diverse cultural groups within the community, including parents of children with a diverse range of abilities and health needs. The research questions linked to Aim 1 are listed in Table 1.

Focus groups were recorded, transcribed and a thematic analysis was undertaken to address the research questions.



PHASE 2: The role and impact of the CUBS program on child and family outcomes

This phase was designed to address Aim 2, to examine whether participation in CUBS leads to early identification diagnosis of child health and development challenges, family engagement with health and other services, and high levels of parent satisfaction with the supports available to them. It employed a mixed-methods design with data linkage.

Due to Covid-19 restrictions, most interviews and surveys were conducted by telephone. The research questions and measurement tools used to investigate Aim 2 are summarised in Table 1.

Data from the screening reports for the 24 children whose parents gave consent were collated and analysed to identify the health and development needs and challenges for children within the CUBS program.



Interviews with 36 parents were conducted, audio recorded and transcribed. In 2021 a second wave of Covid-19 lockdowns restricted access to pre-school and community sites resulting in interviews being conducted by telephone. The interview questions are included in Appendix 3. Transcripts were analysed thematically. This involved careful reading of each transcript, assigning codes to specific responses and identifying categories of information as themes in the data.

Twenty-five parent responses were collected through an online survey. Despite all parents reporting internet access in their homes, many sought researcher support to complete the survey. Disruptions to face-to-face contact with parents due to Covid-19 resulted in most surveys being conducted by telephone, facilitated by the research assistant who completed print copies of survey questions during telephone interviews. As survey and interview responses were audio recorded, having transcripts to complement print records enabled data entry to be checked for accuracy against the audio recordings. Data analysis and reports generated by the online platform were considered in light of the themes identified in the interview data. Survey items are included in Appendix 4.



PHASE 3: Cross-sector partnerships to support children and parents, and facilitate a smooth transition to school

This phase was designed to address Aim 3, to explore the impact of CUBS on school readiness and cross-sector partnerships to support children in the transition to the first year of primary school. Interviews were conducted with key service providers including two CFHNs, the CUBS speech pathologist and school principals. Interview questions are included in Appendix 3. Professional conversations were also conducted with a representative of The Hive and others within the local community who were part of the CUBS collaboration.

In addition, transition to school interviews were conducted with five parents, two pre-school directors/assistant principals, one primary school principal and three kindergarten teachers. Interview questions are included in Appendix 3. The data collected from these interviews informed the development of case studies on the transition to school process for five children. All interviews were recorded and transcripts analysed thematically. Narrative case studies were compiled to exemplify the transition to school experience for five individual children. Study findings are presented in Sections 4, 5 and 6.



SECTION 4: PHASE 1 FINDINGS

Understanding the barriers and facilitators to family participation in early childhood health and development screening programs



There were five themes identified in the focus group data that directly informed our understanding of the barriers and facilitators to engagement with screening program.

Theme 1.1: "Health checks are for sick children"

A clear theme in the focus group data was the perception that health checks are for sick children or those with identified health or development issues. This finding is illustrated by parent statements such as:

"My kids are just healthy ... the health check, is it if they are sick?" (F22).

Parents did not subscribe to the notion of well child healthcare and expressed concern that if they took up the time of a busy GP for a child who was not sick, they were "wasting" the GP's time: "I'd much rather them go to a new parent who's struggling" (F21).

Participants reported positive experiences of visiting their GPs when their child was sick or required immunisation, however they were reluctant to take a well child to the GP and risk exposing them to contagious diseases:

"I hate going into the doctor's surgery for three hours just to get the immunisation, which he's not sick. So I'm sitting around everybody that's sick for that long" (F31).

Parents, particularly those who were on temporary migrant visas, raised the issue of the cost of going to the doctor, and a reluctance to find the money to pay for a GP visit for a child who is well.

Theme 1.2: "You've got enough to think about when you're a mother"

Parents expressed value in receiving SMS reminders about immunisations that were due, but saw limited value in the Blue Book, reflected in comments such as: "I don't even go through the Blue Book" (F35) and "... you've got enough to think about when you're a mother. You're barely even remembering his appointments, but when someone sends you a text, oh that's right, I've got to go" (F33).

Parents expressed positive experiences of baby health centre visits in the first few months after birth, particularly for their first baby. While child and family health nurses were seen as supportive in the very early years, parents did not associate child and family health nursing with health care for their child beyond infancy.

Theme 1.3: The importance of relationship and a culture of care and consistency

Focus group data suggested that the culture of health service settings could be both a barrier or facilitator to participation. Having to see many different GPs rather than being able to establish a relationship with one, and long wait times resulted in frustration at having to provide the same information at each visit. This culture of GP surgeries made it difficult to build a relationship with their preferred GP and presented a barrier to participation. One participant commented that the culture of GP surgeries, because of how busy the environment is, wait times, and constant new faces, was traumatising for her child. This culture was also frustrating for parents, exemplified by comments such as:

"We try to keep the same doctor but she's only in certain days. So some days we'll go in and she's not on [duty]" (F35); and "You can't pick what day you're going to be sick" (F31).

Dismissive attitudes from health professionals was raised by some participants as a barrier to engaging with health services. For example, one mother described her attempts to follow up with a CFHN who had visited her at her home:

"...and she never contacted me again, so I was ... trying to message her about certain different things ... like for tips and tricks and stuff like that. And she was blunt with it, so I was like, okay, well I'm not really going to continue to ring you" (F34).

Some participants perceived health services to be less responsive to parents who have had multiple children, for example:

"When I had my number three here ... they didn't offer a lot ... they think that you know everything ... you're pretty much forgotten about really ... I think because ... this is my fifth child, 'Oh no, you don't need help'. That's the attitude". (F33)

Participants' reports of positive experiences engaging with responsive, sensitive GPs with whom they felt rapport emerged as a facilitator to participation. One parent recounted her experience of seeing a new GP with whom she felt an immediate connection:

"I'm not going to let her go ... she really welcomed me and explained everything to me" (F22).

Having a positive relationship with one health care provider reduced the need for parents to tell their story many times to multiple people. Parents spoke of the need for streamlined systems for storing and communicating information across service providers. They also expressed frustrations and recounted delays in immunisation records being transferred to Centrelink and pre-school, negatively impacting on family benefits and pre-school enrolment, and saw these delays as reflecting a health care service culture that did not prioritise children and families.

Parent satisfaction with healthcare services was strongly linked to the extent to which they felt a connection with the provider. They valued healthcare that was relational. When they perceived that the healthcare provider took an interest in them and their children, and/or shared a common language or cultural background, they felt valued, and expressed satisfaction with the service.

Theme 1.4: Immunisation is the priority in the early years, development will come with time

In relation to their children's health and development needs, most participants in focus groups emphasised immunisation and weight checks as the health priority

areas in the years from birth to school. An interesting aspect of the data was the common parent belief that child development would happen in its own time.



For example, one participant said:

"Well my second child, he's two. He didn't walk until he was almost two ... He only just started talking a couple of months ago. So compared with my first he was very behind ... I'm like 'what's wrong with him?' And now you wouldn't think there was anything wrong with him 12 months ago. He has just picked up ... Just like overnight he just woke up and was able to do everything ... So sometimes I've found that when you just let things happen on their own they tend to happen. "(F21)

This perception that child development will happen in its own time exemplifies data suggesting that, with the exception of immunisations and weight checks, health and development screening is not a high priority for the parents who participated in the focus groups. Parents did not talk about healthcare providers as a source of information about child health and development. Some indicated that they received advice and information from families and friends and others placed value in their own experience as parents.

Theme 1.5: The CUBS program is a good idea

Participants responded positively to the idea of child health and development screening services being embedded in early childhood settings. They expressed the view that a service ("with no sick people") would be of value and they appreciated the easy access to screening that such a service would provide.

Summary of Phase 1 findings

The participating families equated support and information about child health and wellbeing with healthcare from GP's. They did not identify CFHNs as having a role in supporting them and their child beyond infancy, potentially suggesting a lack of awareness of the support available from local Child Health Clinics. They felt reluctant to engage with GP clinics for well child healthcare, seeing this as using the Dr's time unnecessarily and exposing their child to risk of illness. They also felt resistant to seeking out GP care when they did not have a relationship of care and trust with the GP. A further barrier to participating in screening programs was the belief that child development would happen in it's own time, and not something a parent should worry about too much. Immunisation was seen as the health priority.

Key barriers: The unwelcoming culture of GP clinics, lack of information on services available, parents not prioritising child development and well child healthcare

Key Facilitators: positive and sustained relationships with GPs, convenience in the delivery of services integrated with early childhood education services.



SECTION 5: PHASE 2 FINDINGS

Examining the extent to which participation in the CUBS program led to early identification of child health and development challenges, family engagement with health and other services, and high levels of parent satisfaction with the supports available to them



This section of the report identifies and discusses two issues: the developmental support needs of the participating children; and service satisfaction and sources of information.

THE DEVELOPMENTAL SUPPORT NEEDS OF THE PARTICIPATING CHILDREN

The ASQ and ASQ-SE, completed for the 24 participating children revealed developmental support needs for children across all domains: communication, gross motor, fine motor, problem solving, personal social and social-emotional. Females scored higher than males on all domains. However, a larger sample size is needed to allow further analysis and to determine if this is a consistent trend. On all but the communication domain, more children were on track developmentally than were in the ‘monitor’ or ‘refer’ categories. Communication difficulties were particularly prevalent, with 67% of the children demonstrating challenges. The children collectively demonstrated particular strength in gross motors skills.

Figures 3 to 8 provide insights into the assessments for each domain.

Figure 3: Communication scores

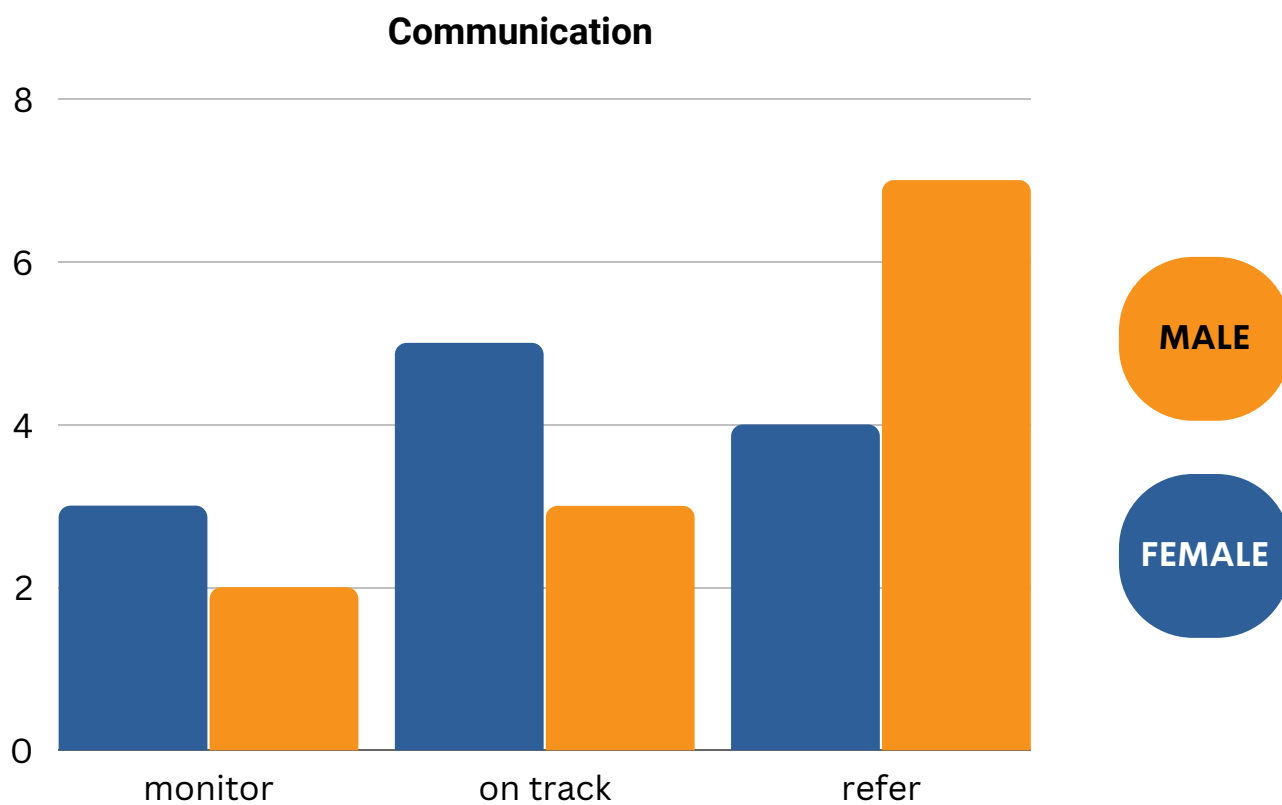


Figure 4: Gross motor scores

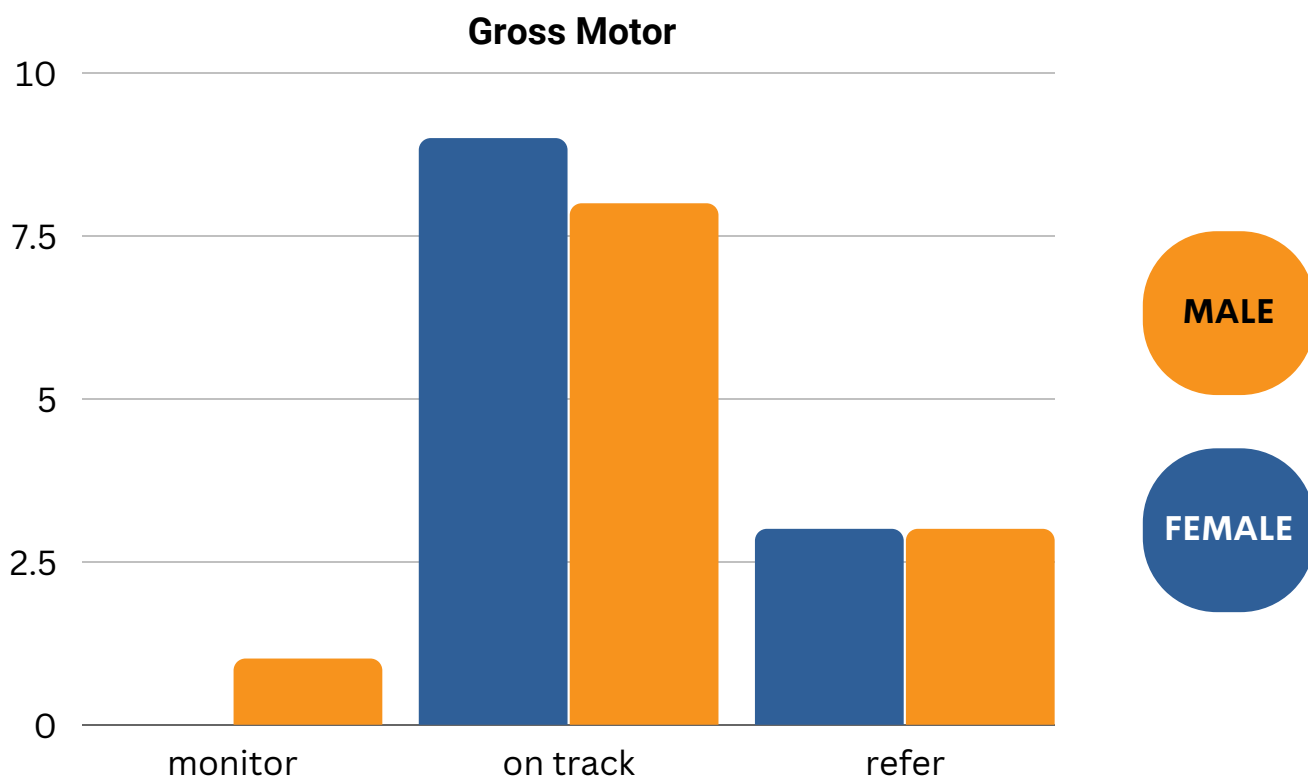


Figure 5: Fine motor scores

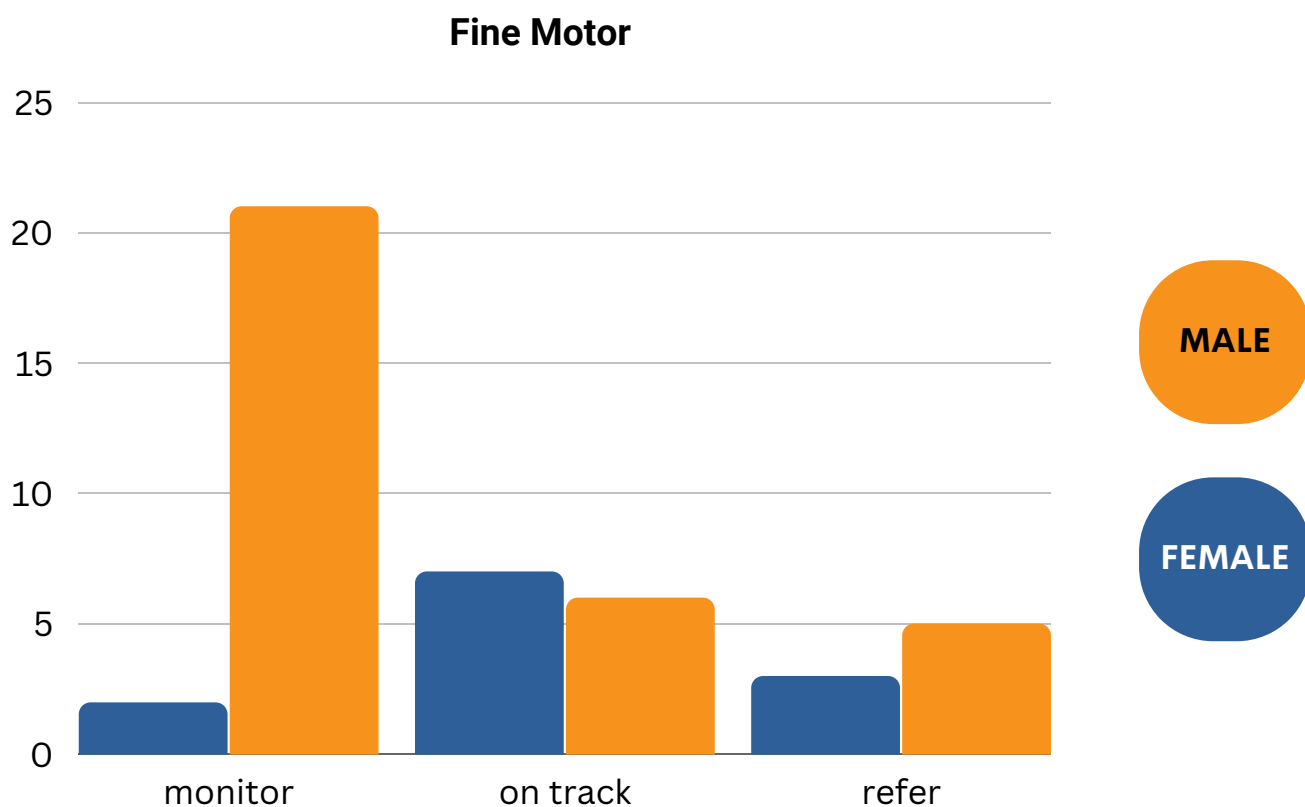


Figure 6: Problem solving scores

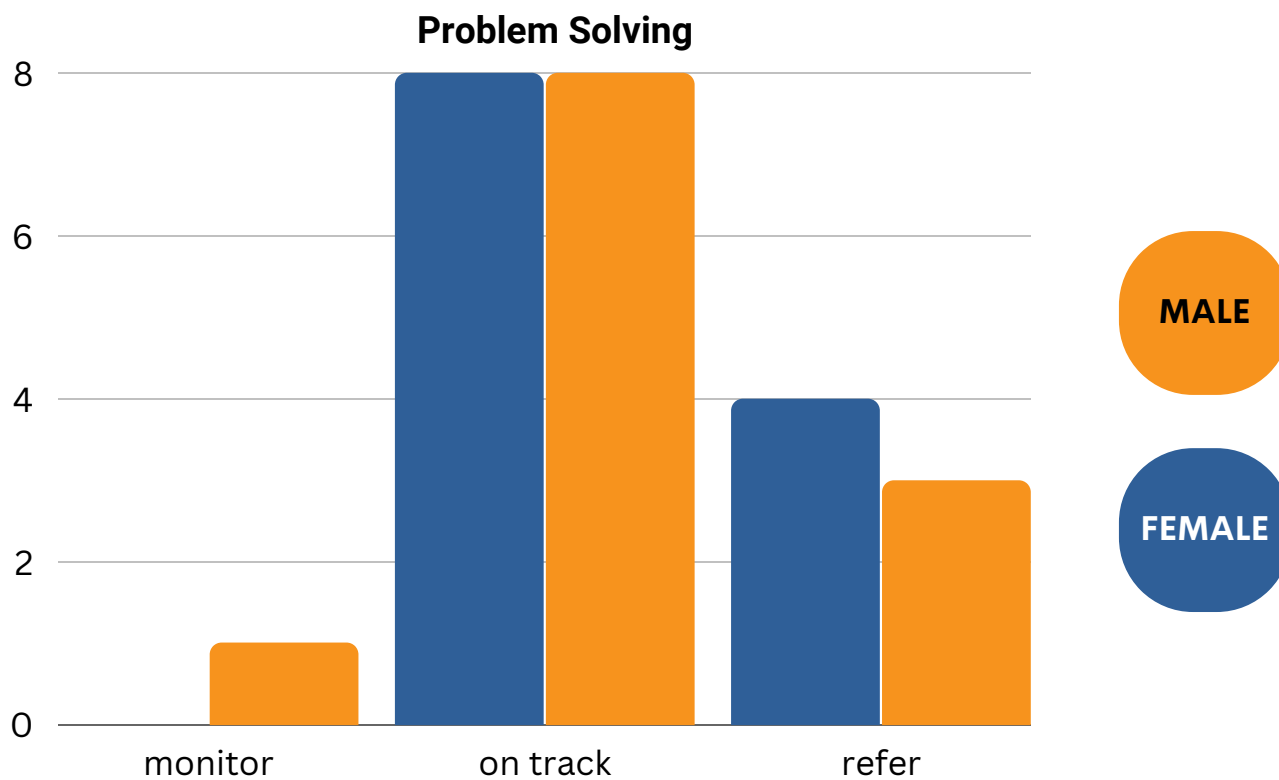


Figure 7: Personal-social scores

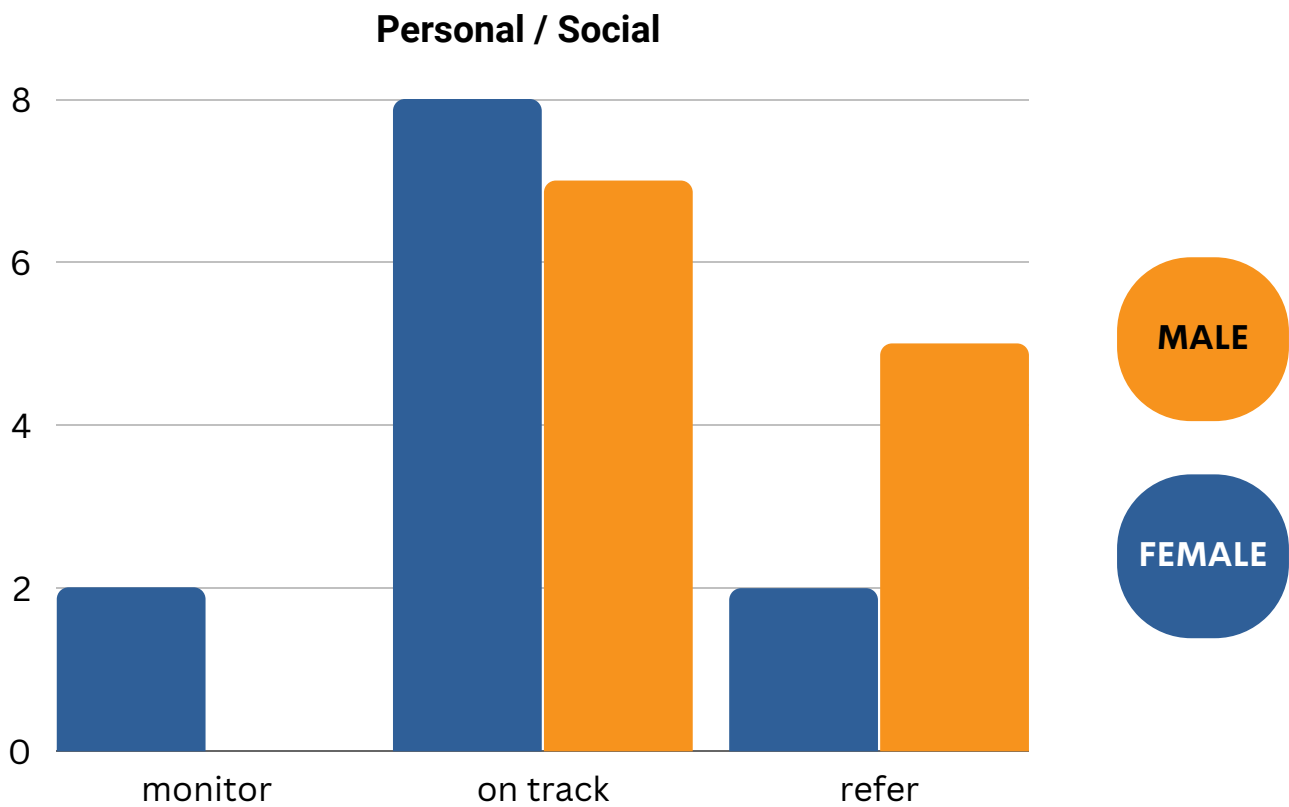
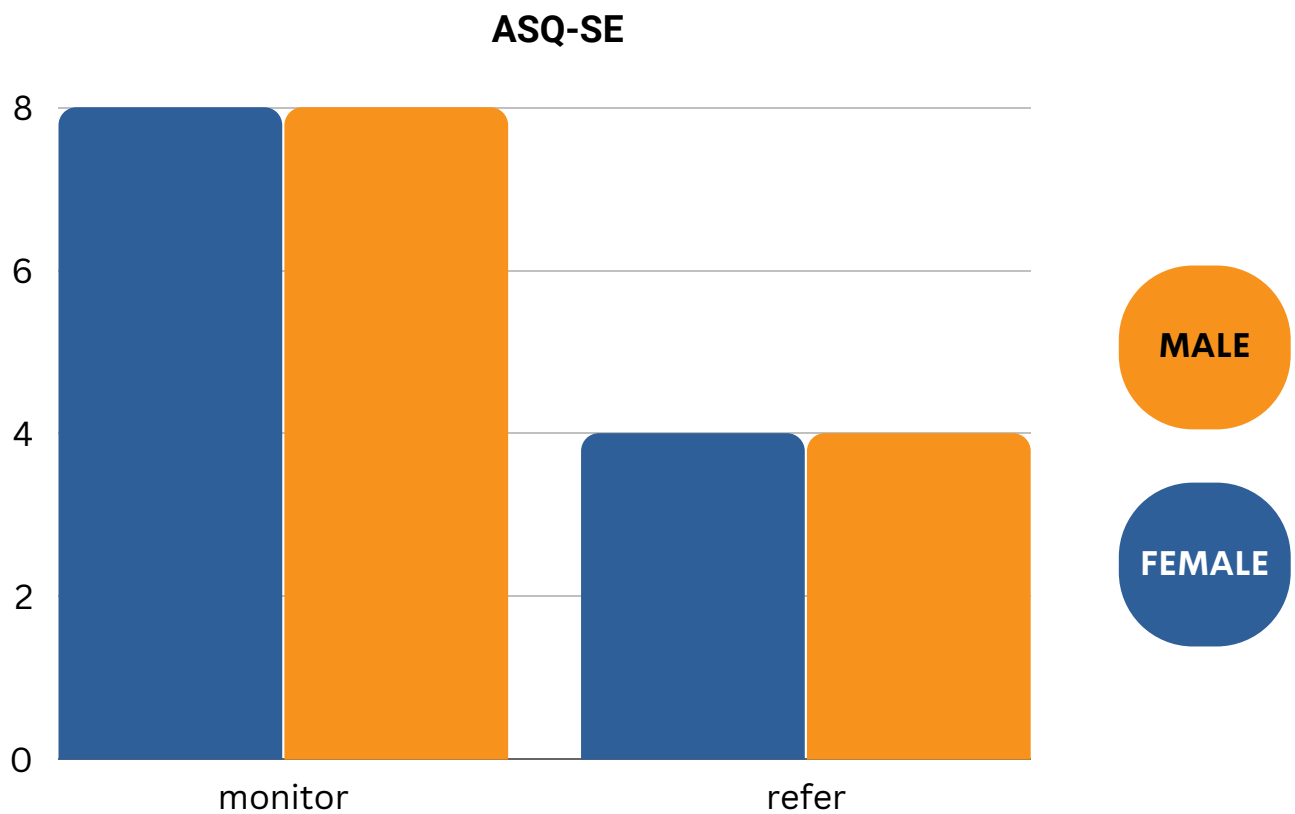


Figure 8: Social-emotional development scores



A total of 56 referrals were made for the 24 children, 25 for females and 31 for males. Only six children did not receive any referrals, including: one who had already been approved for NDIS support and was accessing services, and one who was attending a private speech therapist and paediatrician.

Most referrals were for speech and hearing services. Fourteen children were referred to more than one service, and two were referred to six allied health services. New NDIS applications were commenced for four children (two females and two males). Four children (three males and one female) who received referrals for speech therapy through allied health were also referred to the CUBS speech therapist for follow-up support. Eight families were referred to the CUBS health linker for assistance with enacting referrals. Table 8 below provides a summary of the services to which referrals were made

Table 8: Summary of referrals

Child Gender	Occupational therapy	Speech therapy	Behavioural psychology	Dental	Hearing	Paediatrician	Total
Female	4	6	2	4	5	4	25
Male	5	9	1	3	9	4	31
Total	9	15	3	7	14	8	56

The qualitative interview and survey data provides some insight into the extent to which parents acted on the referrals.



Theme 2.1: Following up on referrals

About a third of parents interviewed said the CFHN had made referrals during the CUBS check-up and that they had followed up and attended, or were on waiting lists for services from dental, speech, hearing or paediatric allied health professionals.

At interview and in the survey, respondents cited a range of factors as potential barriers to following up on referrals made during the CUBS check-up. These included Covid-19 restrictions, cost of services, limited access to transport and technology, family circumstances that made it difficult to follow up and attend appointments, and limited understanding of why referrals were necessary. One parent indicated that she had used an alternative service to the one that the CFHN referred her to. Another said she did not follow up because she did not think the referral was necessary.

In the survey data, 20 out of 25 respondents indicated that their GP was a source of child development information. This finding appears to be in conflict with the finding in Phase 1 where parents indicated that they did not seek out this kind of information from their GP. It is possible that parents see GPs as a source of information, but do not necessarily seek it out. It may also be that engagement with the CUBS program led to an increase in family engagement with GPs. The regularity of GP visits ranged from monthly (n=10), twice yearly (n=6), fortnightly (n= 2), weekly (n=1) and yearly (n=1).

Despite the barriers acknowledged by parents, the survey data suggest that when referrals were made during CUBS check-ups, most parents made efforts to follow up. Data also suggest that most families had a connection to a GP, however the regularity of attendance varied.

SERVICE SATISFACTION AND SOURCES OF INFORMATION

Theme 2.2: “Screening helps you pick up on things that you wouldn’t normally pick up on”

Many parents regarded CUBS screening as beneficial, a shared responsibility with parents, to

“pick up on things you wouldn’t normally pick up on” (V).

One parent commented,

“I find it’s a lot better for the community to be able to have their kids [screened] and make sure that the kids are developing the way that they’re supposed to” (M). Another stated,

“I feel it takes a lot of pressure off [parents] just having another opinion on your child’s development and where to go to and how to get help and all those things. It makes it so much easier” (Q).

Parents interviewed expressed their satisfaction with CUBS as a valuable and credible source of information about the extent to which their children were meeting developmental milestones,

“making sure that she meets milestones that other kids are meeting” (H).

Parents also mentioned the role of CUBS in preparing children for school, exemplified in the following comments:

“It’s good for parents to know if there’s something wrong prior to starting kindergarten” (Z);

“if you can get to them early, if you can get the problems early ... it makes them easier to rectify before they start school which helps learning outcomes” (C);

“they will be more confident at school and not be as shy as if they didn’t have the program” (G).

Parents valued the convenience and familiarity of having CUBS screening available at pre-school, exemplified by one parent’s feedback,

“It was good because it was at the pre-school ... I didn’t have to take my child anywhere else and it was a familiar environment for her” (H).

Another expressed the value she perceived in being present during the assessment:

"For myself as a parent, to be present and see for myself how the nurse and my child interact is something hands on ... and you can make your own opinion in regards to what is being done ... and how your child understands the questions ... and whether the child understands how to proceed in completing an activity. So it’s remarkable ... I think it is a good initiative." (EE)

For yet another, being able to see the scoresheet during the assessment enabled her to feel engaged in the process:

“on the day I could see everything visually ... Just seeing the score sheet visually myself was good enough for me” (DD).

Another parent used the information she accessed during the assessment to plan and implement activities at home:

"So what I've learnt from the assessment is that I made a schedule for him for playtime, reading time, writing time and family activity time ... so what the program has shown me is this will help and make a big difference. I suppose if I didn't attend the assessment and see for myself, I could only just assume." (EE)

These data provide evidence of parents' positive engagement with CUBS. For many parents attending the check-up was a confidence-building experience that gave them ideas and empowered them to actively participate in their children's health and development.

While most parents valued the familiarity and convenience of having CUBS assessments occur in pre-school settings, one presented a counter view: “my daughter seemed to be quite distracted throughout ... because the room was right next to the other room where she normally goes to play with her friends, so she wanted to play with her friends” (H).



Theme 2.3: "It gives you that paperwork"

Many parents perceived the CUBS program as a credible source of child development information that could be used to inform follow-up conversations with their GP, allied health specialists and ECE staff. One parent stated:

"The reports that I have gotten from the CUBS program, I take on to my GP and the paediatrician, and it shows the concerns that I have or the concerns that I have missed. It helps the paediatrician understand what's going on at the day care." (AA)

Another concurred:

"It gives you that paperwork to take with you to your GP or your speech therapist or whoever, and you can go, 'look, there's something wrong, I need something done'. It's not just you going, 'there's something wrong that I'm not seeing', it's in black and white, 'this is their development, this is where they're falling behind, I need something done'." (Q)

While many parents – including 14 survey respondents – indicated their GP as their main source of child development information, accessibility and isolation were raised as barriers to health screening generally:

"We went to the GP and had a health screening there, because there's no ... easy access to maternal health nurses in this suburb, it's quite isolated" (C).

Survey respondents also indicated that they accessed child development information from family and friends, the internet, early educators, pharmacy, and phone help lines. Parent feedback suggested that due to its credibility, the information gained from CUBS could be used to complement and extend the support they were accessing from other health services.

A small number of parents said they had experienced delays in receiving information after the assessment and suggested they would like more written information provided at the time of the check-up, such as "leaflets and contact information" (EE).



Theme 2.4: "CUBS in the community"

At interview and in the survey, a number of parents expressed concern for families whose children were not attending ECE, exemplified in the passionate plea by one parent:

“Accept everyone ... there are parents out there who are struggling and they need help with their babies getting to pre-school ... can you encourage more parents to do this?” (U).

Another suggested,

“there needs to be a better hub ... to target the children who are not in early education” (Q).

Others suggested a drop-in service offered at a shopfront or local church. One parent suggested a mobile CUBS service “that goes to your home” (H).

Many parents referred to the “the community hub” as a suitable venue to extend CUBS access to families outside of ECE. It should be noted that the CUBS program was offered in community locations in line with this suggestion from parents, however uptake from families was low, suggesting the need for more widespread advertisement of the program, but also the importance of support to engage in programs of this nature from trusted professionals such as early childhood educators. It is also highly probable that fear surrounding the COVID-19 pandemic interfered with family engagement in community sites.

Theme 2.5: “The CUBS team are really helpful”

At interview and in the survey, parents provided positive feedback on the CUBS team: the CFHN, speech therapist and health linker.

Parents expressed the positive rapport they felt with the CFHN and the value they placed on the service she provided, through comments such as:

“She [nurse] was very caring and nice and answered all my questions” (H);

“It was really, really good relationship, cause if she [nurse] didn’t have an answer at the time she would find out and then contact me later to give me the information” (G);

“on the day she was lovely ... she told me what I needed to know, she explained what we were doing, why we were doing it” (K);

“The nurse explained everything to me before conducting the assessment and I understood everything she explained. It was really good communication” (EE).

The following parent feedback reflected the nurse’s approach to the check-up and her care and patience towards children:

"She was lovely. She took her time with my kids, my youngest son is very shy and easily distracted, so something that could’ve taken 20 minutes probably took 45 to an hour, but she had the time and the patience with him, and she let him go at his own pace ... she was very accommodating." (AA)



Two parents described their relationship with the CFHN beyond the assessment: “She [nurse] still rings every once in a while to see how we are going ... how the appointments are going” (D); “The health care nurse, she is very good and she’s always there every time we come here she says hi and she helps us and she said if there is any questions just call her” (E).

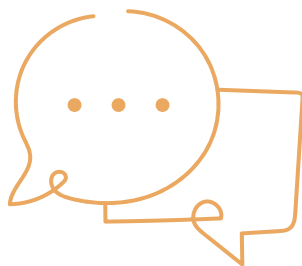
These data suggest that the CUBS pilot facilitated the development of positive nurse-parent relationships; the nurse became an influential, trusted and reliable source of information, advice and support within family networks.

Many parents identified their children’s speech development as an area of concern that was addressed by the CUBS program, exemplified through parent feedback such as

“They got my son and daughter into speech therapy which is what they needed. ... I didn’t know how to go about that” (D).

Another parent shared her experience:

The nurse noticed that she actually needs a bit of speech therapy ... she’s got a little bit of a lisp and isn’t quite finishing sentences, so that is just something I just thought was normal and just plod along with, but ... they picked up on that early and yeh, and we can get anything sorted. (F)



The work of the part-time speech therapist who joined the CUBS team in 2021, whilst impacted by Covid-19 restrictions, was valued by parents and ECE staff. One parent described the intervention received by her child, “the speech therapist that came out, [name] she really helped [child] with his speech as far as saying his and hers it was him and her, he or she, I instead of me, there’s been so many different things” (L).

Similarly, an ECE professional outlined the support provided by the speech therapist, including: individual assessments of children flagged by ECE staff and CFHN; explicit assistance in setting communication

goals across the pre-school; sharing of resources and activities that ECE staff could implement in class; and information workshops with families conducted initially by the speech therapist and continued by ECE staff.



Parents who had received assistance from The Hive health linker highlighted support received to make and pay for initial appointments, and navigate the National Disability Insurance Scheme (NDIS). One parent said:

"We were very lucky that the organisation, The Hive, have offered to pay for the initial assessment at the paediatrician and then another assessment and a follow-up appointment, but after that, we have to pay for all the appointments ... I've had help with the NDIS, I've had help with the paediatrician, I've had help with getting their hearing checked and it's put me in touch with a couple of other organisations." (AA)

The efficiency demonstrated by the health linker was a highlight identified by parents who had been waiting a long time to access allied health appointments: "[The CFHN] has been very helpful ... I had been waiting over a year before I put my name down for [child] and hadn't got anywhere. But when [CFHN] got in contact with me she found somewhere for me to start speech" (T); "She got me a paediatrician appointment" (U).

Assistance to navigate the NDIS and payment for services from private health providers were also much valued support

provided by the health linker, exemplified in the detailed feedback provided by participant AA:

"They have one person. She is very, very versatile in the NDIS programme and paediatricians. So, she managed to find a paediatrician that had availability within weeks of me contacting her. She organised all the appointments, they paid for it, they organised everything, they ask all the hard questions to the receptionist and they actually have certain paediatricians that they work with. And she also found speech and OT that had shorter waiting lists and my children are on multiple waitlists at multiple places. She is also helping write reports for if I need extra help and anything like that. " (AA)

These data emphasise the scope of the CUBS program as a “wrap-around” service consisting of both screening and practical intervention to address identified needs and support families in an ongoing way. Many parents described the CUBS assessment as an enabling process that increased their understanding and gave them the confidence to actively support their children’s health and development. Supportive relationships between parents and CUBS team members were key factors in parents’ perceptions of the program’s effectiveness.

Summary of Phase 2 findings

In summary, data collected in Phase 2 revealed that parents valued screening services as sources of knowledge about the extent to which their children are meeting milestones. Most parents indicated irregular contact with a GP to seek advice on their children’s health and development. However, they regarded CUBS as a key source of credible information about child health and development, which could inform more meaningful communication with their GP and other healthcare providers. The accessibility of CUBS offered in familiar environments enabled parents to participate in the assessment, thereby facilitating their increased understanding of their children’s developmental needs, and confidence in supporting them. Parents expressed their concern for families not accessing CUBS and suggested ways to expand its reach. Relationships with and practical assistance provided by the CUBS team empowered many parents to become an active voice in their children’s health and development.

SECTION 6: PHASE 3 FINDINGS

Exploring the impact of the CUBS screening program on school readiness and cross-sector partnerships to support children in the first year of school

This phase of the research drew on family interview and survey data, interviews with professional stakeholders, and a case study approach which looked at the experiences of five families whose child had diverse support needs in their transition to school.

INTEGRATED AND CROSS-SECTOR WAYS OF WORKING

Theme 3.1: “There is very intentional work going on”

Analysis of interview data revealed that close coordination across the work of professionals representing the community sector, health and education was a deliberate strategy in the establishment of the CUBS program, described by one community service provider as “very intentional work” (S2). One education professional stated:

“when they [parents] signed that consent form it meant that information could be freely shared between the nurse and educators” (E3).

Another described the coordination between the CUBS program, pre-school and school, as a

“close hand over ... we know at least the CUBS will have happened for them before they come in the door” (E1).

The coherence in professionals’ coordination was evident in feedback from families, as illustrated by one parent who stated,

“The Hive, the school and the community house all work together” (I). Another shared her awareness that “the day care here works as part of a broader collective with different organisations” and emphasised the relational aspect of CUBS:

“everyone who works, the school, the day care, everyone who works over at the hub, it’s all really relational ... they build really good relationships” (C).

Theme 3.2: “Sometimes you just need someone to break it down and go, this big word means this”

The coordination across the work of professional groups enabled practical assistance to be provided to families. As an example, one parent mentioned that ECE professionals had helped her to understand her child’s CUBS report: “it’s easy for them to decipher it and then communicate it back to you in a way that’s more relatable ... they sit down with you and explain everything, which is good” (Q).

Another stated, “it’s good to have all the information linked through to each other so it’s easier to explain as well” (GG).

Analysis of interview data from parents and carers suggested that coordination and coherence across the work of professionals gave families confidence in the CUBS program, expressed by one parent:

“if there are any major concerns then I guess the nurse would be able to pick up on that and give you a referral to go over to the GP and then go the right direction to get that assessed” (J).

Theme 3.3: “A very place-based approach especially the delivery”

Analysis of interview data from professionals representing community, health and education sectors within the Mt Druitt area revealed a shared commitment focused on early intervention that is “family friendly” (S2) to address barriers experienced by families who were “getting missed” (S1). Professionals described CUBS as cross-disciplinary support that enabled families to “reach out without having that pressure of [a] top-down approach” (S1).



One community service provider elaborated on the CUBS place-based approach to service delivery:

"We're not targeting the families for whom they get an appointment and they go. We're actually trying to get families where children are being missed. Those who have got a real difficulty with the service system. Very traumatised lives, so getting those things done is really difficult. Interacting with the system is re-traumatising them because they're having to tell their story. We've changed the way we do things, to make things friendlier. The way we interact with the people we work with. We've culturally changed what we do. "(S2)

The relational aspect of CUBS, which emerged through analysis of data from parent interviews, was also a feature emphasised by professionals:

"we use a relationship-based model. We build trust and develop and build connection and relationship with the families over two terms." (S1).

"In a very corporatised social services system, this [CUBS] is very family friendly. Everything we do is soft." (S2)

The delivery of cross-disciplinary support in a non-judgemental way was a feature of CUBS highlighted by professionals.

One education professional stated:

"The nurse was someone that was here three days a week, so they [parents] sometimes saw her around ... a familiar face. I think that needs to be considered because sometimes these families [suffer] from trauma ... it's really hard for them to go into the unknown and meet a new person and ... to take their child and almost feel that there is that sense of judgement ... so having a familiar space and a familiar person helps take away that [sense of judgement] for them." (E3)

Another professional mentioned a non-judgemental approach to referral:

"another feather in the cap of CUBS is the fact that we refer them on to non-judgemental professionals that are supportive of the family. It's not a tick-box model" (S1).

The responsiveness of the CUBS cross-disciplinary approach was exemplified by the comments below relating to identified speech and language delays:

"We have big issues with speech and language development ... a lot of children come to school with quite significant delayed speech and language development, which really impacts on their learning and ... in many ways, they go undetected... It's almost normalised in some areas where all the children seem to be having similar issues." (E1)



These concerns were echoed by health professionals:

“they still have speech sound errors that should have resolved by the age that I see them ... that’s quite common across all the different pre-schools that I’ve been in ... parents were normalising the delay” (H3);

“several of the children who would come in who are non-verbal” (H2).

The CUBS model of cross-disciplinary collaboration provided a structure within which to respond to these needs,

“she [speech therapist] was really responsive to what the pre-school needed and what the educators needed and ... of course what the children needed” (E3).

Theme 3.4: “A mindset of supporting other organisations to do their work”

The effectiveness of the CUBS pilot was underpinned by a culture of collaboration, described by one community service provider as

“a mindset of supporting other organisations to do their work” (S2).

The CUBS model enabled cross-disciplinary information sharing which was valued by professionals and had benefits for children:

“sometimes [CFHN] picked up things that we hadn’t picked up on and vice versa. We were able to let her know our concerns before the check-up so that she could look further into those concerns as well” (E4).

Feedback revealed benefits for both professional practice and professional learning.

“A really valuable part of this programme is working together with the educators and identifying children that they have concerns with and giving them strategies to support that child in the classroom or support multiple children in the classroom.” (H3)

Theme 3.5: “A game-changer and win-win for families”

Professionals alluded to the potential of CUBS to influence system change in the delivery of child and family health in the pre-school years. One professional described CUBS as “a massive game-changer and ... win-win for families” (S1).

This professional continued:

“Because you can talk about going to Community Health all you want, but there’s so many but there’s so many barriers that families have to go through in terms of transport, cost, multiple children to take along. So these things really get missed” (S1).

Another referred to the collaborative CUBS model as “[allowing us] to be able to try and make systems change” and elaborated:

“I think it’s broadened Community Health’s perspective as well, to be honest. I love the fact that Community Health see the value in coming to the service instead of the families coming to them. Because we know it’s not working. Not for every family. So, big picture, I’m seeing a big win with that in terms of Community Health changing their thoughts and processes around what that looks like.” (S2)

Analysis of data collected from professionals engaged in service provision to families in the Mt Druitt area revealed that

“a really valuable part of this [CUBS] program [has been] working together” (H3) to offer coordinated family friendly and place-based early intervention that was responsive to needs and delivered in a non-judgemental manner. CUBS “changed the experience for them [parents] so that it was a softer experience” (S2); it helped them

“to navigate the system” (S1),

“empowering them to look for the solutions themselves or pointing them in the right direction [so] that they can continue to seek support or continue to use the strategies” (H3).

Analysis and interpretation of professionals’ perceptions of the effectiveness of the CUBS model resonated with the experience of family representatives presented in Section 5. Professionals highlighted the effectiveness and benefits of cross-disciplinary collaboration and the potential of the CUBS pilot to influence system change.



THE VIEWS OF EDUCATION PROFESSIONALS ON THE IMPACT OF CUBS

Theme 3.6: “A solid foundation for the child”

The Educators who were interviewed unanimously held the view that prior-to-school health and development screening had positive impacts for children’s readiness for, and transition to school, as well as for families and receiving schools. One educator described how screening in pre-school helped schools to prepare for addressing an individual child’s needs, thus easing the transition for both child and parents:

"Sometimes we have children that start school, but we have worries about the child, that they might have a disability or there’s a health issue and parents are not aware or it comes as a shock to them. I think if it’s happening in preschools, it would help with us being prepared for those students ... [and] would really make that [transition] much easier, for the child and for the parent. "(E2).

Another concurred,

“when they come into school, it [prior-to-school screening] really helps us to know where they’re at, or what they need. It helps us give the support to the student ... [and makes] that transition a lot smoother for that child” (E6).

In relation to the CUBS program specifically, one educator described information sharing between families, health and education professionals, and The Hive as an enabler of streamlined service provision to families in preparation for their children starting school. Another stated:

“I can’t overemphasise how much value it [CUBS] is to get these kids as well-prepared, and the teachers prepared for the kids before they start. Yes, it’s an amazing project” (E5).

Another described the CUBS report as providing the kindergarten teacher and carers with

“insight on how [child] was doing in Preschool ... [and] a picture of where their child is and areas needing improvement or attention” (E7)

Educators' views about the positive impacts of prior-to-school health and development screening and CUBS in particular were echoed by health professionals: one referred to screening as

“providing that solid foundation for the child so that when they are entering school for the first time, we’ve got all their needs identified in being able to support their learning” (H3).

The positive impacts of prior-to-school health and development screening on children’s readiness for, and transition to school extend also to parents and teachers. CUBS allows for information sharing with parents and schools prior to school entry, thereby enabling streamlined and focused preparation to address children’s identified learning and support needs from the point of school entry.

The timing of CUBS assessments was an issue raised in interviews with educators. It was suggested that assessments conducted during terms 1 and 2 would allow for referrals to be enacted and support to be in place prior to children’s transition to school.

“If there’s some way that the children would be able to access speech or OT or things as a part of that program, I think that would really help the children be a lot more prepared for school.” (E4)

This view was also evident in feedback from some parents and carers, illustrated by the comment:

“if it’s done early enough, during pre-school, and earlier in the year, when you’ve got a whole year to work on things that need to be worked on” (CC).

However, during the CUBS pilot, assessment timetables were disrupted by Covid-19, negatively impacting on follow-up support and information exchange.



Theme 3.7: The importance of information exchange

Feedback from parents and educators suggested that to enable the positive impacts of CUBS on children's transition to school to be realised, processes need to be put in place to facilitate the smooth and timely flow of information (CUBS reporting) from health to parents and ECE settings, and between ECE settings and receiving schools. When the CUBS pilot was initiated, the consent form signed by parents to allow their children to be screened was linked to the transition to school statement to allow

“any flags or any concerns that were picked up from the CUBS program that [were] then able to go to school with them ... that continuity of where the child is medically, emotionally, socially. All those developmental aspects” (S1).

However, Covid-19 restrictions disrupted the CUBS screening timetable, as well as ECE and school transition programs. These disruptions negatively impacted information sharing processes. Some parents reported delays in receiving information following the assessment.



For many children, check-ups were conducted late in the year, after transition to school statements had been prepared by ECE professionals. When CUBS reports were received by the ECE setting, they were forwarded on to receiving schools if these were known. One receiving school educator said,

“I did receive a transition to school statement from the pre-school ... but I didn't know anything about the health and development screening” (E6).

Another emphasised the benefits of information sharing:

“I think any information we can get before the children start school helps us with putting them in the right class, with the right teacher and with the right support” (E2).

Streamlined exchange of information would help to avoid duplication, as explained by another educator:

"If we were made aware of it [CUBS] so that we know and we don't double-dip. When they start school, if they've already got an allied health professional involved, we don't try and double-dip and ask the parents again because that can be a bit much for them as well. "(E5)

Educators emphasised the importance of consistent processes in the future to ensure that CUBS reports follow the children to the school they enrol in, which may or may not be linked to the ECE setting in which the assessment occurs.

Findings relating to the impacts of health screening, particularly CUBS, on children's transition to school and the importance of information exchange are further exemplified in the transition to school case studies that follow.

TRANSITION TO SCHOOL CASE STUDIES

The following five case studies were informed by interviews with parents and educators. They illustrate the transition to school experiences of five individual children and their families. Pseudonyms are used in place of children's names.



Case study 1: Kiah

Kiah received a CUBS assessment in December, 2021 at age 5. She commenced school in 2022. Her parent reported that her transition was smooth and she was enjoying school,

“that’s all she talks about. She enjoys playing with her friends. She likes the teacher, school in general, she’s very excited”. Her parent reported having had no direct contact with Kiah’s teacher.

In a previous interview Kiah’s parent reported that the CUBS check-up had been enlightening and had given him helpful information: made him aware of what to look out for, showed him what his child was capable of doing, and what he needed to spend more time on with her. He also said that Kiah’s motor skills were less developed than his other children’s and that was something he would work on with her. The parent reported that after the check-up he spent time with his daughter having her

“copy what I write ... and also we’re playing a lot of games now, to try and enhance those skills and just throwing balls to each other, all kinds of little games just to help [develop her motor skills]”.

In the transition to school interview he said,

“she’s a lot more energetic now, she likes to actually do stuff and be the leader ... It [the check-up] made me realise that I need to do more stuff than when she was little”.

Kiah’s kindergarten teacher said that she was settling in at school well and noted her confidence, strong fine motor skills and listening skills. Kiah could already write her name when she entered kindergarten.

It’s made that transition to school a lot easier now, because rather than focusing on developing those fine motor skills, developing those listening skills, the ability to answer questions, sit still, listen to a story, we can get straight into the learning, rather than teaching all those skills that are required beforehand.



(Kindergarten teacher)

The kindergarten teacher said she had no concerns about Kiah's transition and that the child did not need any extra support.

Kiah's parent indicated that he had received "a report from the preschool, a kind of disclosure that they were allowed to pass that on to the primary school" and that the report aligned with his understanding of Kiah's readiness for school. It was his understanding that the pre-school had forwarded it to the school. Kiah's kindergarten teacher confirmed that she had received a transition to school statement but was unaware of the CUBS screening.

Kiah's pre-school teacher confirmed that Kiah had strong family support while she was attending pre-school. She indicated that Kiah had experienced successful orientation visits to her school in term 4. However, the pre-school teacher was not able to confirm whether or not Kiah's CUBS report had been forwarded to her school and explained that: transition to school statements had been prepared early in term 4, CUBS assessments had been impacted by Covid-19 and had occurred later in the term, and CUBS reports had been received by the pre-school during the school holidays.

"Once they move on to that next school, we didn't really know where a lot of them had ended up because we'd already sent transition to school statements."

Kiah's principal expressed support for the notion of health screening in pre-schools generally, had heard about CUBS but had little knowledge of the program. She emphasised the importance of sharing CUBS reports with receiving schools:

"I would just say that just to make sure that each child that does it, that there's a connection to the school they're going to".

This case study illustrates how the CUBS assessment influenced one parent to actively engage in his daughter's development of fine motor skills, which were highlighted as a strength during the child's transition to school. The case study also reveals gaps in the information exchange between the pre-school, the parent and receiving primary school.



Case study 2: Levi

Levi received a CUBS assessment in December 2021 aged 5. He commenced school in 2022. His carer said he was very excited and loved going to school. She said that making friends, playing, and doing homework and classwork were highlights of Levi's transition to school. She also said that what he had learnt in pre-school – how to count and pronounce words – had influenced his successful transition to school.

Levi's carer said she thought CUBS was a very good program that has benefits for children and provided parents and carers with "peace of mind" about their children's levels of development. She said that she thought the CUBS report had been sent to the receiving school but that she had not received it.

Levi's pre-school teacher said, "he was really happy to go to kindy". She pointed out she had recommended he remain at pre-school for another year to further develop his social and emotional, and communication skills. She also mentioned that she had been liaising with The Hive health linker and receiving school in the preparation of an NDIS application in response to his CUBS assessment.

Levi's kindergarten teacher said he had transitioned well into kindergarten and made no mention of the NDIS application in progress. She suggested that their one-on-one meetings during Basic Skills Tests had given Levi a sense of security, the opportunity to talk about

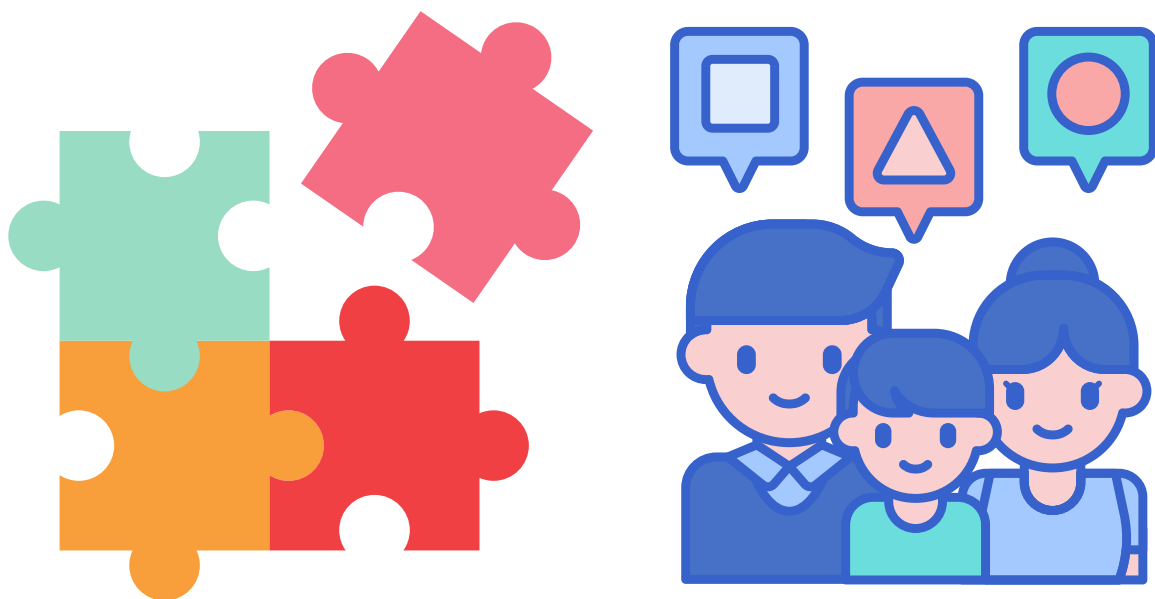
"his school break and see that I also spoke to his carer which made him feel even safer and comfortable in coming to class a few days later".

The kindergarten teacher said she was aware of the CUBS check-up and had received the report which had given her and Levi's carer insights into how he "was doing in pre-school". She recalled no recommendations or "red flags" from the CUBS assessment and stated that orientation visits late in 2021 had allowed her "to see [Levi] in person and have my own observations in preparation for his Kindy start for the coming school year".

The kindergarten teacher said she had not suggested any additional support to assist Levi in his transition to school.

"He is doing very well in class and flourishing in his new environment and developing all the skills essential to succeed in kindy."

This case study reveals there had been a delay in sending the CUBS report to the carer and that the kindergarten teacher's perceptions about Levi's CUBS assessment and recommendations were at odds with those of the pre-school teacher. These aspects suggest there had been communication gaps throughout Levi's transition to school process.



Case study 3: Caiden

Caiden received a CUBS assessment in May 2021 at age 5, and commenced school in 2022. His parent said he experienced no separation anxiety starting school: “see you later, goodbye, leave me alone, Mum, I’m ready to go into the gate”.

Caiden’s parent said the CUBS assessment in May 2021 had identified that he had a lisp, and a referral for speech therapy was made. The parent had hoped that Caiden would be receiving weekly speech therapy by the time he started school, however he was still on a waiting list for a public speech therapist, a delay she attributed to Covid-19. She said she received transition to school information from the pre-school and gave it to the receiving school principal in week 1.

Caiden’s pre-school teacher said that his transition was as smooth as it could be during Covid-19 and she was aware of CUBS recommendations related to his speech. The transition program implemented by the pre-school focused on Closing the Gap initiatives and health screening. As children who attend the pre-school transitioned to all schools in Mount Druitt, the pre-school teacher said it was challenging to work with particular schools, but noted that transition to school statements were prepared for every child. These focused primarily on: "What we saw with the children at the service, but we did encourage the parents to use the referrals and the information that they had received from the CUBS program and [provide] that to the school when they did their enrolments ... I don't know if [Caiden's] mum did, but we did encourage that." (Pre-school teacher)



In relation to CUBS, the pre-school teacher also pointed out that “we had our check-ups just before lockdown, so there was no follow-up or anything as such with our children because of that”. “I know they did make referrals for our families, but a lot of the families are just sitting on waitlists now.”

Caiden’s kindergarten teacher said he had settled in extremely well, was compliant and very keen to learn. The teacher said she had noticed “a speech issue ... that could have some work” and had flagged this with the school executive as something to raise with Caiden’s parents once he had settled in. She was unaware of the CUBS screening Caiden had received in 2021: “I didn’t know at all, and I even went and looked up his file to see if there [was] anything on there, and nothing”.

Whilst Caiden’s parent and pre-school teacher were aware of a CUBS referral for speech therapy, this information had not been explicitly passed on to the receiving school.

Case study 4: Holly

Holly received a CUBS assessment in December 2021 at age 5, and commenced school in 2022. Her carer (grandparent) said, “she’s certainly settling in really well, yes, she loves it”. Holly’s grandmother said she had spoken to her teacher “twice in the last couple of weeks. She said she’s doing pretty good. When she concentrates enough, she does her work really fast, but she’s just got to get that concentration in”.

Holly’s grandparent linked her concentration to a scheduled appointment with a paediatrician to follow up on Holly’s behaviour:

“she’s just on the go all the time. He’s under the impression that she’s probably got ADHD”.

The grandmother also mentioned a scheduled meeting at the school: “they have a case plan that we go through”.

The family’s link with the paediatrician had been established prior to the CUBS assessment, according to the grandparent, who said that no other information for follow-up had been identified during the assessment.

Holly's kindergarten teacher said she had settled in well:

"She was shy at first but after the initial two weeks of schooling she became comfortable with the new environment and members of the class and took off from there. She is very keen in learning and an active participant in all our class activities." (Kindergarten teacher)

The kindergarten teacher said that her daily contact with "Nan and Mum made [Holly] feel safe". The kindergarten teacher said she had received a copy of the CUBS report and had spoken to her parent and grandparent about it, "especially her hearing test ... the carers inform me about the check-ups and hearing doctor recommendations to support [Holly] in class".

"Knowing [Holly] has some hearing loss, we were able to coordinate with another school in the area and they lent us the soundwave speaker to test if that will work best [for Holly] so she can hear well [in] class." (Kindergarten teacher)

Holly's pre-school teacher said she was "doing really well in regard to her social and emotional and academic development".

She also mentioned ongoing support provided to the family in regard to Holly's hearing loss, which she indicated had been identified prior to the CUBS assessment.

Holly's grandparent, kindergarten teacher and pre-school teacher all referred to the family's links with allied health professionals that had been established prior to the CUBS assessment in pre-school. However, there were discrepancies in the information provided. The educators' emphasis on hearing support was not mentioned by the grandparent, and her emphasis on behaviour support was not mentioned by the educators. Their accounts provided no explicit links to the CUBS assessment, although the kindergarten teacher alluded to a "hearing test" in the report.



Case study 5: Kyle

Kyle received a CUBS assessment in November 2021 at age 5, and commenced school in 2022. His parent said his transition had been successful:

“he’s changed, he’s grown up so much in these couple of weeks ... he comes home and he goes, ‘I learnt the letter s today’”.

Kyle’s parent said that being present during the CUBS assessment had enabled her to see what he was able to do and confirmed that he was ready for school, perceptions being realised

“now he’s come home and he’s talking to me about what he’s learnt”.

The parent’s recollection of the CUBS assessment was that the nurse “was pretty happy with [Kyle], from what I could gather so there was no concerns that needed to be addressed or anything”.

She recalled passing on information to the school, “a tick sheet ... with any concerns with autism and stuff like that ... I’m pretty sure everything was fine anyway”.

Kyle’s kindergarten teacher said he already knew her before his preschool class’s orientation visit, because his older brother had been in her class in 2021.

“Having that connection made Kyle feel safe and secure and resulted to him settling in well in class.”

The teacher said the CUBS check-up had given her and Kyle’s carers an insight into his progress in pre-school. She said that the report was provided to her at the beginning of term 1, 2022 and contained “no red flags at all”.

Kyle’s pre-school teacher said she knew that he had had a successful transition to kindergarten and was “doing really well in his new classroom there and performing quite well academically as well”.

She recalled receiving the CUBS assessment report during the school holidays, printing it and providing copies to Kyle’s parents and kindergarten teacher at the beginning of the school year.

Together, the five case studies illustrate the individuality of the transition to school experience and reveal some inconsistencies and gaps in communication processes between ECE settings, parents and primary schools. These will be elaborated on further in the discussion of challenges associated with participation in the CUBS program.

THE BENEFITS AND CHALLENGES OF THE CUBS PROGRAM

Analysis of interview data presented in Section 5 and earlier in this section highlighted descriptions of both benefits and challenges associated with participation in the CUBS program. The following discussion elaborates further on the benefits and challenges described by parents and health and education professionals.

BENEFITS ASSOCIATED WITH PARTICIPATION IN THE CUBS PROGRAM

Theme 3.8: Holistic support in convenient locations

Parent feedback analysed and presented in Section 5 suggested that CUBS provided parents with holistic support, including: information about their children's health and development, referrals to specialist services, assistance in accessing and paying for appointments with healthcare providers, and increased knowledge and confidence to support their children. In addition to parent feedback cited in Section 5, the following comments also alluded to these benefits:

“it was all positive because it is all to do with the health of the child” (J), “she [nurse] explained to me what my child's development should be at” (H), “she [nurse] really went out of her way to try and help us out with therapies” (Q), “she [health linker] got me a paediatrician appointment” (U), “I've got information on how to maintain their teeth and healthy eating, stuff like that, stuff that I think I wouldn't have got before” (M).

Parent feedback suggested that the accessibility and convenience of CUBS, offered in familiar ECE and community settings, was also a benefit for parents as it enabled them to easily attend assessments:

“It's been really handy because you go there while you're at school” (S), “actually being at the school ... makes it a lot easier for the parents” (W), “we don't have a maternal health nurse here in this suburb ... so if you have it at the pre-school here it's easier [to] access” (C), “it was good because it was at the pre-school because I didn't have to take my child anywhere else and it was a familiar environment for her” (H).

Educators also described benefits for parent engagement, arising from CUBS being offered in ECE settings, exemplified by the following comments:

"One of the big benefits especially in the community that we're in is that a lot of families have not actually had any health checks before they came to pre-school, and having the prior-to-school check-ups in the pre-school, that made the access a lot easier." (H3)

"Being at the service, I think, really helped a lot of our parents engage. I know they're reluctant to engage in things offsite where they don't know people, so being here at the service was a huge help. And [name] the nurse was very flexible as well. If a parent had made an appointment and didn't show up, she would come on a different day or a different time to try and work in and around that family as well. "(E4)



This comment by an education professional highlighted the flexibility of CUBS and the efforts made by the CFHN to support families and place children's health at the centre of the program.

Education and health professionals also described offering CUBS in ECE and community settings as “dovetailing” with their work:

"I can talk to the teachers and [they] are very open and ... refer children that they're concerned about ... that relationship between the staff at the early childhood centres and the staff here at [The Hive] and myself is really important." (H2)

This comment illuminates a benefit for the work of education and health professionals; smooth cross-disciplinary collaboration, an important feature of the CUBS model, is enabled and strengthened by locating the program in ECE and community settings. “That’s what makes this [CUBS] a unique program.” (H2)



CHALLENGES ASSOCIATED WITH PARTICIPATION IN THE CUBS PROGRAM

Theme 3.9: Covid-19

Many of the challenges described by parents and health and education professionals resulted from the global pandemic. As outlined in Section 1 of this report, the implementation of the CUBS pilot was interrupted by government mandates to protect the community by restricting children's attendance at ECE and health professionals' access to ECE and community settings. The work of the speech therapist and health linker was modified to allow for the provision of tele-health support to families. However, families' access to technology was, for some, a further restriction.

Covid resulted in disruptions to the assessment schedule resulting in many children being assessed in terms 3 and 4, with reports received late term 4 and during the school holidays:

"It did make it tricky being in term four. That was no fault of anyone, except for Covid hitting. Because a lot of them weren't getting seen until those last few weeks of the school ... those children had already gone to school by the time we'd got their reports. "(E3)

"Unfortunately for us, we had our check-ups just before lockdown, so there was no follow-up or anything as such with our children because of that." (E4).

For some children and educators these delays meant that CUBS reports were received after transition to school statements had been prepared and sent to

receiving schools. As a result, some educators were unaware that some newly arrived kindergarten students had received health screening in pre-school. In these cases, disruptions and delays caused by Covid-19 limited the extent to which CUBS assessments could inform transition to school planning.

Parents also described the Covid-19 related challenges of attending appointments with specialists:

“And with Covid and everything, we did have an appointment lined up for an OT, but because it was out of area, so that was a bit off the cards” (Q)

Theme 3.10: Meeting existing demand – Conducting CUBS assessments and delivering reports in a timely and consistent manner

Parent feedback suggested that some experienced delays between participating in CUBS assessments and receiving follow-up information. Feedback from health and education professionals linked these delays to the capacity of the program to address demand; screening as many children as possible sometimes resulted in backlogs of assessments to be entered in the system and delays in issuing reports to parents.

"I find sometimes there's a little bit of lag in the time that the assessment's done and then the time we actually get the summary. That's just because we were booking appointments every day that she was here and every appointment available to her. I'm imagining, I can't speak for the nurse, [Name], but it's just so hard in trying to fit, we have 80 children." (E3)

One educator expressed the benefits in receiving the assessment summary “fairly quickly so that we can do something about it straight away. If that's something that can happen where it's not so rushed ... to be able to give families more time and opportunity to see them” (E3).

For this ECE professional, receiving assessment summaries at the end of a screening cycle may result in “70 summaries ... to go through and try [to] support. But if it was more streamlined, that it was an assessment and then the week after we got the summary ... then we could work with that family” (E3).



Theme 3.1 1: Making CUBS more widely available

Analysis of data collected from parent and carer interviews and presented in Section 5 indicated a concern shared by many parents that families whose children are not engaged in ECE or day care may not have access to CUBS. Other challenges identified were some parents' limited access to technology, "if they don't have a phone or internet, that's going to be a struggle for a lot ... because pretty much everything, appointments and all that, are mostly done online ... or on the phone" (M); and transport, "some parents without a car, they can't get to appointments in time" (U), "public transport is pretty bad here" (H).

The view that CUBS should be more widely available was illustrated by the comment:

"I think there are 200 odd children under four in this suburb, according to the census data, so a lot of them don't come here [day care centre] ... so it would be good, just broadly speaking if everybody in the suburb had access to it [CUBS] ... just let people know that we are setting this up and if you have got a child starting school ... it's time to come down and we will do a free health check." (C)

This challenge, along with time pressures on health professionals – amplified by Covid-19 – to meet existing demand and deliver reports in a timely manner, has implications for future health planning and resourcing.

Summary of Phase 3 findings

Analysis of data collected in interviews with parents, health and education professionals, and community service providers suggested that professionals supporting the CUBS pilot – allied health, ECE, The Hive health linker and community service providers – actively engaged in cross-disciplinary collaboration to deliver a holistic, coordinated program of place-based support to children and families. Unfortunately, the implementation of the pilot and work of health and education professionals was disrupted due to Covid-19. Other challenges included the production of timely reports, and streamlined and consistent information exchange between ECE, parents and schools. Despite the challenges and disruptions, parents and carers, health and education professionals identified the potential of CUBS to positively impact on children's readiness for, and transition to, school.

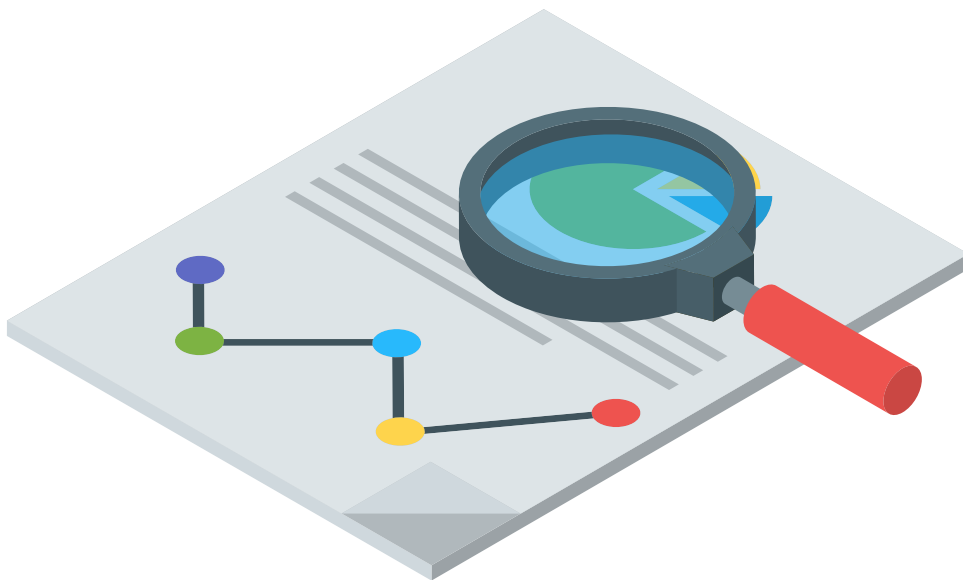
A key benefit of the CUBS model, described by parents and carers, health and education professionals, was the convenience of being offered in both ECE and community centres, familiar environments for children and families.



SECTION 7: CUMULATIVE LIST OF FINDINGS

1. Some parents' understandings of their children's health and development needs and the screening available were limited to immunisations and to a lesser extent weight checks.
2. Parents valued health care services that were relational, where they perceived that health professionals took a genuine interest in them and where they shared a language or cultural background with the provider.
3. Parents liked the idea of health and development screening being provided in pre-school.
4. Analysis of child health records for 24 children revealed health and developmental needs across the ASQ and ASQ-SE domains and 56 referrals to allied healthcare services.
5. Parents interviewed who received CUBS referrals to allied health services made efforts to follow up.
6. Parents who have engaged with CUBS highly valued the service as a key source of child development information which they would like to see expanded.
7. Parents' participation in CUBS and the follow-up report have the potential to inform more meaningful and regular contact between parents, GPs and allied health specialists about their children's health.
8. CUBS has facilitated increased understanding of children's health and development needs for many parents and provided them with ideas for supporting their children at home.
9. The CUBS team – the nurse, speech therapist and health linker – all provided practical interventions that were highly valued by parents and had noticeable benefits for families.
10. Professionals supporting the CUBS pilot – allied health, ECE, The Hive health linker and community service providers – actively engaged in cross-disciplinary collaboration to deliver a holistic, coordinated program of place-based support to children and families.
11. The implementation of the pilot and work of health and education professionals was disrupted due to Covid-19.

12. Despite disruptions, parents and carers, health and education professionals identified the potential of CUBS to positively impact on children's readiness for and transition to school.
13. A key benefit of the CUBS model described by parents and carers, health and education professionals was its convenience, being offered in ECE and community centres, familiar environments for children and families.
14. In addition to those posed by Covid-19, parents and carers, health and education professionals identified challenges relating to the capacity within the existing CUBS program to:
 - a. conduct screening and deliver reports in a timely manner to ECE and parents
 - b. manage streamlined and consistent information exchange between ECE, parents and schools
 - c. make CUBS accessible to more families in the Mt Druitt community.



SECTION 8: CONCLUSIONS AND IMPLICATIONS FOR FUTURE PRACTICE

This report presents the findings of a research study exploring the child, family and service level impacts of the Check-ups Before School (CUBS) pilot project. The research evaluation generated rich, context-embedded data to illuminate the experiences of the participants in the CUBS program and the realities of the implementation of CUBS. The following conclusions represent a consolidation of the 14 findings generated from data analysis.



Conclusions

1. The complexities of the Mt Druitt community present numerous barriers preventing easy access to health and development screening for families with young children.
2. Offering CUBS in convenient locations, including pre-schools and community centres, has facilitated the development of relationships of trust between parents and education and health professionals.
3. The CUBS screening process and referrals to allied health services have the potential to lead to earlier identification of child health and development challenges.
4. Parents' and carers' growing familiarity with CUBS, and follow-up support provided by the CFHN, the health linker at The Hive Mt Druitt, and the part-time speech therapist engaged with the program, have led to increases in confidence in engaging with healthcare services, and satisfaction with services available to families.
5. Parents' and carers' participation in CUBS assessments has increased their understanding of their children's health and development needs and ways to support them.

BEYOND CUBS

The funding for the CUBS pilot program ceases in August 2022. At the local level, discussions involving The Hive and WSLHD community nursing team have explored options for embedding the model into mainstream service delivery. Simultaneously, The Hon. Sarah Mitchell, MLC, Minister for Education and Early Learning announced the Brighter Beginnings program and budget, including \$111.2 million to bring health and development checks to NSW preschool settings. In a speech delivered at an event hosted by the Hive on 28 June 2022, the Minister said the CUBS pilot program had been crucial in informing the Brighter Beginnings model and her intention was to expand the model throughout the state. Since the announcement, members of the Brighter Beginnings team have engaged in ongoing consultation with The Hive to assist in designing the NSW model of place-based developmental assessments.

These policy developments signify the expansion of the CUBS model, strong evidence of its success within the Mt Druitt community. In light of the future expansion of the model, insights gained from this evaluation are offered for consideration as recommendations for future practice.

RECOMMENDATIONS FOR FUTURE PRACTICE

In the planning, resourcing and delivery of the expanded model of health and development checks to NSW pre-schools, it is recommended that:

- ECE settings administered by community providers be included in the roll-out
- Health and development screening cycles include time allocated for check-ups and administration (data entry and report generation) to allow for timely reporting to ECE professionals and parents, while not compromising the time it takes to employ a relational-based model and build trust with families
- The provision of administrative support to the CUBS nurse to support the timely provision of reports and, ideally, the employment of more than one nurse on the CUBS team to support timely assessments and scale-up of the program
- The delivery of assessment reports to families include face-to-face discussions and assistance for families in accessing follow-up services through NSW Health
- Assessment reports be formalised by including them in transition to school statements to ensure consistent, streamlined and explicit information exchange about individual children's health and development between ECE settings and primary schools.

REFERENCES

Australian Bureau of Statistics. (2016). Census.

https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/SSC10340

Australian Government. (2018). Australian Early Development Census 2018 National Report <https://www.aedc.gov.au/resources/detail/2018-aedc-national-report>

Ayer, C., Eapen, V., Overs, B., Descallar, J., Jalaludin, B., Eastwood, J. G., Dissanyake, C., Williams, K., Murphy, E. & Woolfenden, S. (2020). Risk factors for non-participation in a universal developmental surveillance program in a population in Australia. *Australian Health Review*, 44, 512–520.

Blacktown City Council. (2016). Community profile

<https://profile.id.com.au/blacktown/seifa-disadvantage-small-area>

Britto, P. R., Lye, S. J., Proulx, K., Yousafzai, A. K., Matthews, S. G., Vaivada, T., Perez-Escamilla, R., Rao, N., Ip, P., Fernald, L. C. H., MacMillan, H., Hanson, M., Wachs, T. D., Yao, H., Yoshikawa, H., Cerezo, A., Leckman, J. F. & Bhutta, Z. A. (2017). Nurturing care: promoting early childhood development. *Lancet*, 389, 91–102
[http://dx.doi.org/10.1016/S0140-6736\(16\)31390-3](http://dx.doi.org/10.1016/S0140-6736(16)31390-3)

Eapen, V., Woolfenden, S., Williams, K., Jalaludin, B., Dissanayake, C., Axelsson, E. L., Murphy, E., Eastwood, J., Descallar, J., Beasley, D., Črmčec, R., Short, K., Silove, N., Einfeld, S. & Prior, M. (2014). “Are you available for the next 18 months?”- methods and aims of a longitudinal birth cohort study investigating a universal developmental surveillance program: The ‘Watch Me Grow’ study. *BMC Pediatrics*, 14 (234), 1–9

Edwards, K., Rimes, T., Smith, R., Fernandez, R., Stephenson, L., Son, J., Sarkozy, V., Perkins, D., Eapen, V., & Woolfenden, S. (2020). "Improving Access to Early Childhood Developmental Surveillance for Children from Culturally and Linguistically Diverse (CALD) Background". *International journal of integrated care*, 20(2), 3.
<https://doi.org/10.5334/ijic.4696>

Garg, P., Ha, M. T., Eastwood, J., Harvey, S., Woolfenden, S., Murphy, E., Dissanayake, C., Jalaludin, B., Williams, K., McLenzie, A., Einfeld, S., Silove, N., Short, K. & Eapen, V. (2017). Explaining culturally and linguistically diverse (CALD) parents’ access to healthcare services for developmental surveillance and anticipatory guidance: Qualitative findings from the ‘Watch Me Grow’ study. *BMC Health Services Research*, 17 (228), 1–12. <https://doi.org/10.1186/s12913-017-2143-1>

REFERENCES (CONT.)

Goldfeld, S., O'Connor, M., Sayers, M., Moore, T., & Oberklaid, F. (2012). Prevalence and correlates of special health care needs in a population cohort of Australian children at school entry. *Journal of Developmental and Behavioral Pediatrics*, 33(4), 319–327.

Goldfeld, S., Woolcock, G., Katz, I., Tanton, R., Brinkman, S., O'Connor, E., Mathews, T., Giles-Corti, B. (2014). Neighbourhood effects influencing early childhood development: Conceptual model and trial indicator measurement methodologies from the Kids in Communities Study. *Social Indicators Research*, 120, 197–212.

Hertzman, C. (2010). Social Geography of Developmental Health in the Early Years. *Healthcare quarterly*, 14(SP1), 32–41. <https://doi.org/10.12927/hcq.2010.21981>

Jose, K., Taylor, C. L., Venn, A., Jones, R., Preen, D., Wyndow, P., Stubbs, M. & Hansen, E. (2020). How outreach facilitates family engagement with universal early childhood health and education services in Tasmania, Australia: An ethnographic study. *Early Childhood Research Quarterly*, 53, 391–402
<https://doi.org/10.1016/j.ecresq.2020.05.006>

Lipkin, P. H. & Macias, M. M. (2020) Promoting optimal development: Identifying infants and young children with developmental disorders through developmental surveillance and screening, *PEDIATRICS*, 145(1), 1–19. Downloaded on April 27 2021 from www.aapublications.org/news

McLoughlin, J. & Newman, S. (2015). A new approach to educational disadvantage. *Every Child*, 21(1), 10–11.

NSW Ministry of Health. (2020). My personal health record
<https://www.health.nsw.gov.au/kidsfamilies/MCFhealth/Publications/blue-book.pdf>

McLachlan, R., Gilfillan, G., & Gordon, J. (2013). Deep and persistent disadvantage in Australia. Productivity Commission.

Moore, T., McDonald, M. & McHugh-Dillon, H. (2014). Early childhood development and the social determinants of health inequities: A review of the evidence. Parkville, Victoria: Centre for Community Child Health at the Murdoch Children's Research Institute and the Royal Children's Hospital.

Newman, S., McLoughlin, J., Skouteris, H., Blewitt, C., Melhuish, E. & Bailey, C. (2020). Does an integrated, wrap-around school and community service model in an early learning setting improve academic outcomes for children from low socioeconomic backgrounds? *Early Child Development and Care*, Ahead of Print, 1–15. <https://doi-org.ezproxy.uws.au/10.1080/03004430.2020.1803298>

REFERENCES (CONT.)

O'Connor, M., O'Connor, E., Quach, J., Vashishtha, R., & Goldfeld, S. (2019). Trends in the prevalence and distribution of teacher-identified special health-care needs across three successive population cohorts. *Journal of Pediatrics and Child Health*, 55, 312–319

Phair, R. (2021). International early learning and child well-being study assessment framework. Organisation for Economic Cooperation and Development (OECD) Working Papers No. 246 <https://dx.doi.org/10.1787/af403e1e-en>

Richards, N., Reith, D., Stitely, M. & Smith, A. (2019). The before school check (B4SC): Reporting outcomes and referral rates for all New Zealand children. *NZMJ*, 132(1496),9–19.

Wakerman, J., Humphreys, J.S., Wells, R., Kuipers, P., Entwistle, P. & Jones, J. (2008). Primary health care delivery models in rural and remote Australia – A systematic review. *BMC Health Services Research*, 8 (1) (2008), p. 276, doi:10.1186/1472-6963-8-276

Woolfenden, S., Eapen, V., Jalaludin, B., Hayen, A., Kemp, L., Dissanyake, C., Hendry, A., Axelsson, E., Overs, B., Eastwood, J., Cmčec, R., McKenzie, A., Beasley, D., Murphy, E. & Williams, K. (2016). Prevalence and factors associated with parental concerns about development detected by Parents' Evaluation of Developmental Status (PEDS) at 6-month, 12-month and 18-month well-child checks in a birth cohort. *BMJ Open*, 6: e012144. doi:10.1136/bmjopen-2016-012144