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RECEIVED 06 December 2024

ACCEPTED 04 March 2025

PUBLISHED 31 March 2025

## CITATION

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.  
*Front. Lang. Sci.* 4:1540562.  
doi: 10.3389/flang.2025.1540562

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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.

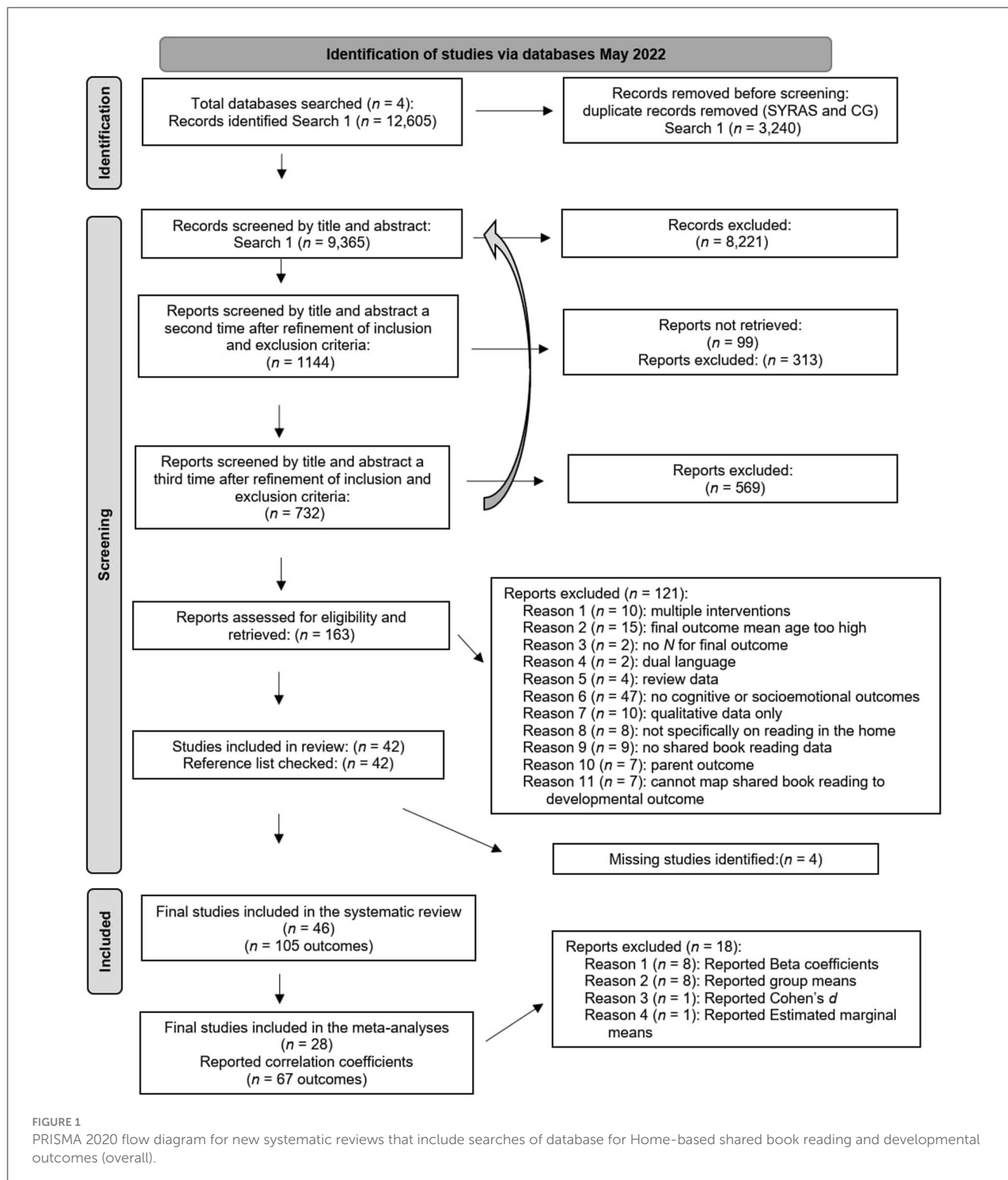
## Synthesis methods

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



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,  $\geq 75$  low quality; Francis et al., 2019); (2) the number of studies included in the meta-analysis ( $\geq 10$  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,  $\leq 0.05$  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     | $\geq 10$         | 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  |                                     |
| $\geq 75$ | Low quality      | $< 5$             | Low quality      | Majority c ( $\leq 50$ )    | Low quality      | $\leq 50$                   | 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<br>“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<br>“Probable association” |
| Home-based shared book reading (composite)                             | Language (composite)                                   | 6                | 1,311                       | 0.381 (0.289, 0.474)     | Moderate quality<br>“Probable association” |
| Home-based shared book reading (composite)                             | Vocabulary (composite)                                 | 5                | 6,629                       | 0.314 (0.291, 0.336)     | Moderate quality<br>“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<br>“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<br>“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).

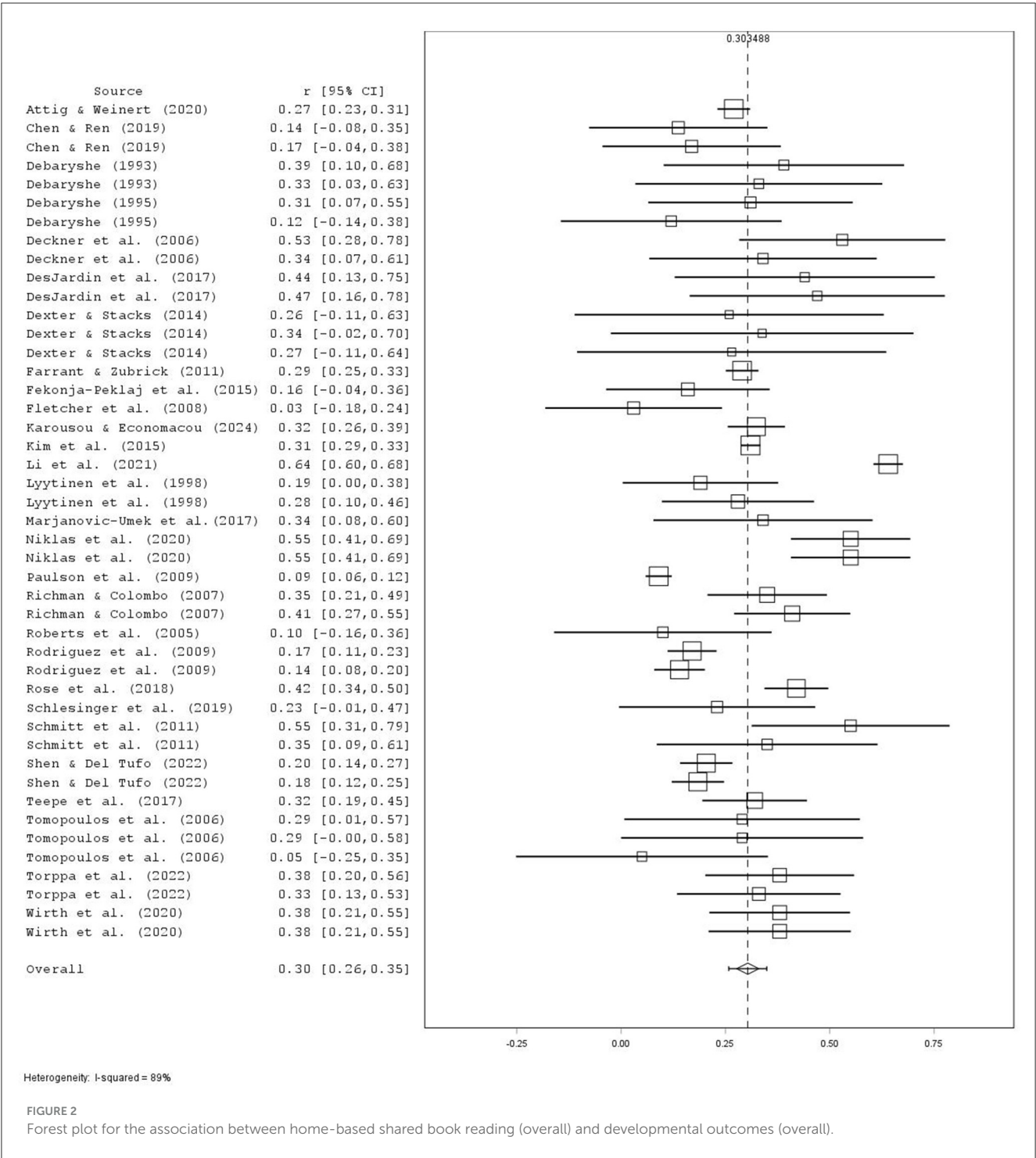
## Meta-analyses results

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).



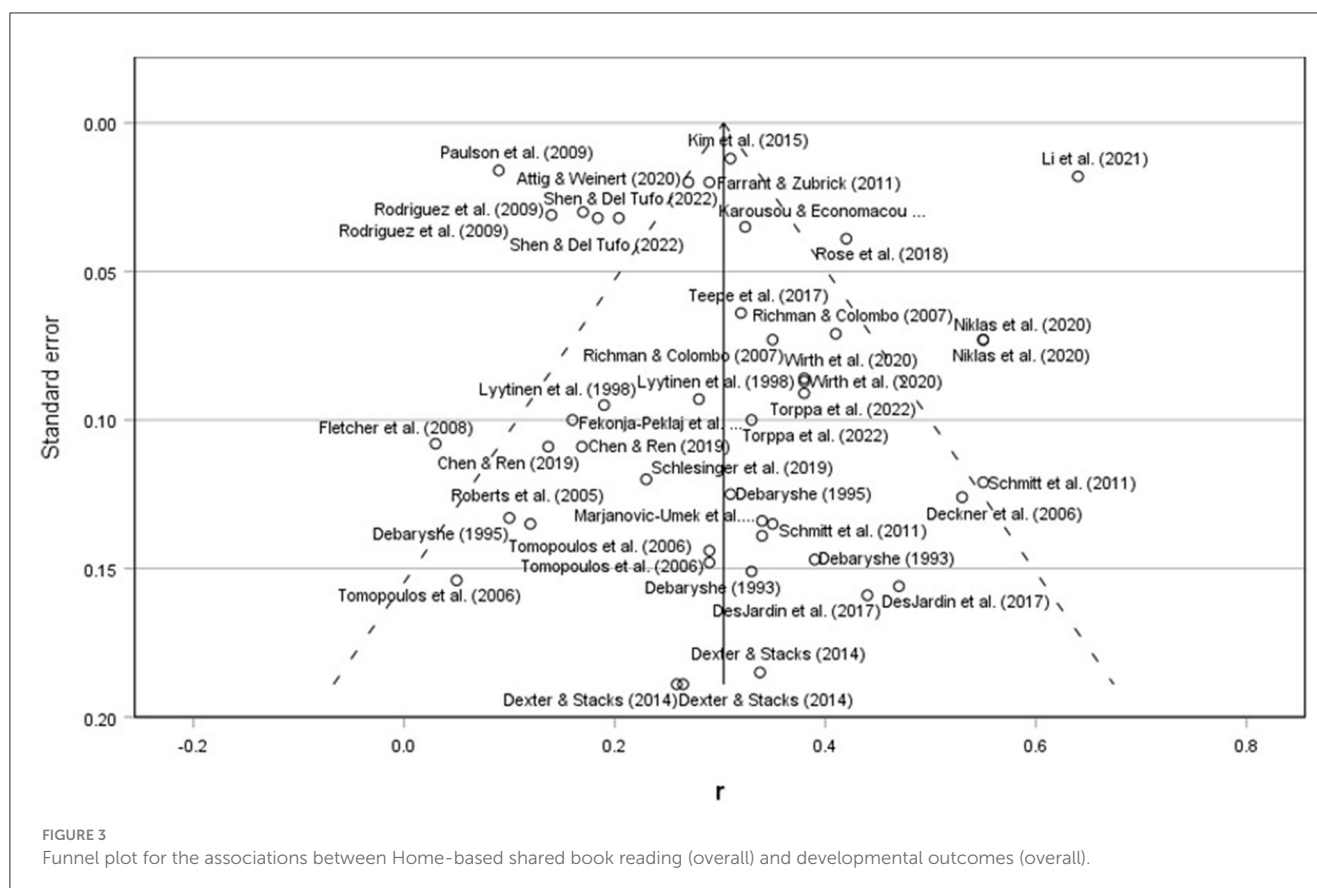
Home-based shared book reading (composite) and developmental outcomes (composite and specific)

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



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 “screeners” 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.

## Funding

The author(s) declare financial support was received for the research and/or publication of this article. The work is part of Claire Galea's PhD, which is partially funded by United Way Australia which facilitates the Imagination Library in Australia. Clayton Noble is the Chief Executive Officer of United Way Australia. This research was funded by a Macquarie University Research Excellence Stipend Scholarship in joint partnership with United Way Australia. Portions of these findings were presented as a spoken presentation at the 2023 Society for the Scientific Study of Reading conference, Port Douglas, Queensland, Australia.

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## 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

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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>

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