

Story Starters Evaluation Report

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Introduction

Speech, language and communication disorders are thought to be one of the most common disabilities to affect young children, with the rate of language delay in the UK estimated to vary between 5 and 10% (Long, Bate, & Bellis, 2018; Boyle, Gillham, & Smith, 1996; Norbury, Gooch, Wray, Baird, Charman, Simonoff, Vamvakas, & Pickles, 2016). While children across the whole socio-economic spectrum suffer from language delay, research has shown that the rates are much higher for children from disadvantaged backgrounds. Locke, Ginsborg and Peers (2002) found that more than half of children starting nursery, who lived in the lowest index of multiple deprivation (IMD) in England, had delayed language skills. Furthermore, research has indicated that children from low-income households are, on average, 16 months behind their high-income peers in terms of their vocabulary development by the time they start school (Waldfogel & Washbrook, 2010).

Poor language skills continue to exert an effect throughout childhood and can have a long-lasting negative impact on many aspects of a child's life (Hoff, 2013; Pace, Alper, Burchinal, Golinkoff, & Hirsh-Pasek, 2018). For example, between 50% and 90% of children who experience persistent speech, language and communication difficulties will also experience difficulties reading (Stothard, Snowling, Bishop, Chipchase, & Kaplan, 1998). This negative impact continues throughout a child's education and the rate of achievement of five GCSE's A*- C is much lower for children with communication difficulties, at 15% compared to 57% for young people in general (Bercow, 2008).

The impact of communication difficulties is even evident beyond the education system and it is estimated that between 60 and 90% of young people in youth offender institutions

have some form of communication difficulty (Bryan, Freer & Furlong, 2007; Gregory & Bryan, 2009, 2011; Justice Committee, 2012). Finally, the impact of poor language skills in childhood can continue into adulthood. Research has shown that children who have poor receptive language skills at age five are more likely to have mental health problems when they reach 34 years of age than their peers (Schoon, Parsons, Rush, & Law, 2010).

Given the negative impact of poor language skills on children's lives, there is a pressing need to intervene to support language development. However, the timing of interventions is also important and there are good reasons to intervene in the early years rather than waiting until a child begins formal schooling. For example, research has suggested that the size of a child's vocabulary at age five is the best predictor of whether disadvantaged children are able to '*buck the trend*' and escape poverty in later adult life (Blanden, 2006), and that children who enter school with good language skills have better chances in school, better chances of entering higher education and enjoy better economic success in adulthood (Blanden, 2006).

Shared book reading as an intervention

One activity that has been shown to support children's early language development is shared book reading. Research has indicated that shared book reading can support a wide range of early language skills, including vocabulary (e.g. Elley, 1989; Farrant & Zubrick, 2011), narrative and conversation skills (e.g. Morrow, 1988; Reese, 1995), print awareness (e.g. Justice & Ezell, 2000; 2004) and phonological awareness (e.g. Chow, McBride-Chang, Cheung, & Chow, 2008; Lefebvre, Trudeau, & Sutton, 2011). Furthermore, research suggests that children who are read to regularly in the early years learn language faster, enter school with a larger vocabulary and become more successful readers at school (Bus, IJzendoorn & Pellegrini, 1995). On the basis of this research, caregivers and early years practitioners have been strongly encouraged to read with children in early childhood.

However, there is some concern that shared book reading interventions that target parents may not be as effective in disadvantaged families, to whom some forms of shared book reading may be less familiar (McCarthy, 1997; Mooney, Winter, & Connolly, 2016). One way to circumvent this problem is to design shared reading interventions that take the pressure off caregivers. This can be done by using early years practitioners or specially trained ‘reading volunteers’ to deliver reading interventions while the child is at pre-school.

The Present Study

In the present study we examined whether a shared reading intervention using trained volunteers could support the language skills of pre-school aged children from disadvantaged backgrounds. Trained volunteers attended 24 pre-schools in the Merseyside area and delivered a 24-week shared reading intervention called ‘Story Starters’. The volunteers attended each setting twice a week and delivered a highly interactive, 20-minute, one-to-one shared reading session with each child. Within each school, half of the children were randomly assigned to receive the ‘Story Starters’ intervention and half were placed in a ‘wait-list’ control group. The children’s language skills were assessed at three time points; before the intervention began, once the intervention was complete and 6 months after the intervention was complete. It was predicted that children in the Story Starters intervention group would show larger gains in their language skills than children in the wait-list control group.

Method

Participants

Eligible participants were monolingual children aged between 3 and 4 and a half years of age living in Merseyside. Exclusion criteria were less than 37 weeks’ gestation, less than 5lbs

9oz at birth, prolonged and/or frequent ear infections, hearing another language (not English) for more than one day per week, children or caregivers who had a disability that prevented participation (e.g. inability to understand instructions). 198 children began the project, 169 children remained at visit 2 and 157 children at visit 3 (see Figure 1 for more details). Children were aged between 3;2 and 4;4 at the first visit (Mean age = 44.85 months; SD = 3.29 months) and 49% of children were female.

Children were recruited from nurseries in disadvantaged areas of Merseyside. To quantify how deprived the sample was, the index of multiple deprivation (IMD) was calculated for each participant using their postcode. The IMD of an area indicates the level of deprivation in that area relative to other areas. The 32,844 small areas in England are ranked from the most deprived to least deprived and divided into 10 equal groups ranging from the most deprived 10% of areas in the country to the least deprived 10% of areas in the country. On average our sample lived in areas in the 2nd decile, i.e. the most deprived 20% of areas in the country (Mean = 2.24, SD = 1.73, Range 1 – 9).

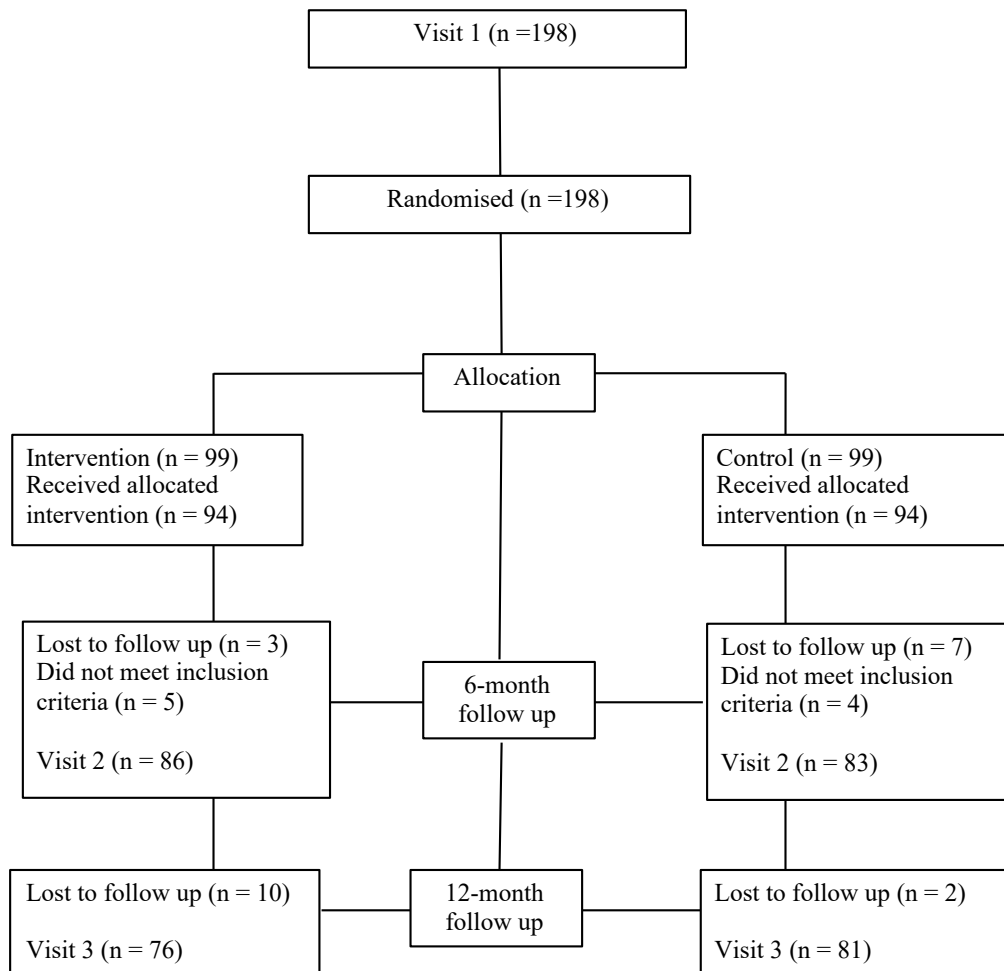


Figure 1. Flow diagram of participants through the study

The Story Starters Intervention

Volunteers attended a one-day training event run by Beanstalk and were trained to read using an interactive dialogic reading style as devised by Whitehurst and colleagues (Whitehurst, Falco, Lonigan, Fischel, DeBaryshe, Valdez-Menchaca, & Caulfield, 1988). Dialogic Reading involves the use of a series of conversational strategies to scaffold an interactive conversation between the child and the caregiver while reading (see Figure 2 for a full explanation). Each reading volunteer was placed in a school and was assigned three children to read with for 20 minutes, twice a week for 24 weeks.

Box 1 - Dialogic Reading

PEER Sequence

Prompt the child to say something about the book (e.g. point to something in the picture and ask, *What is that?*)

Evaluate the child's response - Think about what your child just said. Was the answer correct? If it was correct, let your child know. If your child gave the wrong answer, gently provide the correct answer (e.g. *That's right OR It's a witch, isn't it?*)

Expand the child's response by rephrasing and adding information to it (e.g. *It's a witch flying on a broomstick.*)

Repeat the prompt to make sure the child has learned from the expansion. Ask your child to repeat your expanded or corrected answer (e.g. *Can you say that? OR What is it again? OR Can you say it's a witch flying on a broomstick.*)

CROWD Prompts

Completion prompts - Allow your child to finish off your sentence with a well-known word or phrase from the book (e.g. *The witch had a cat and a very long _____ (hat).*)

Recall prompts - Ask your child about what happens in the story (e.g. *What happens when all the animals get onto the broom?*)

Open-ended prompts - Ask your child an open-ended question about what is happening in the pictures (e.g. *What's going on in this picture?*)

Wh- prompts - Ask your child questions about the story or pictures which start with 'who, what, where, why, when and how'. You can point to something in the book and ask your child to name the object or the action (e.g. *What is coming out of the dragon's nose?*)

Distancing prompts - Ask your child questions that link something in the story to your child's own life (e.g. *Do you remember when we went to the Halloween party? What did everyone dress up as?*)

Figure 2. *Explanation of dialogic reading*

Intervention Materials

All volunteers were given a ‘starter pack’ of materials to use during the 24-week intervention. This included books and a hand puppet. Each volunteer also received one book per month, which was sent to their home address and gifted by the Dolly Parton Imagination Library (DPIL). All children enrolled in the project also received one book per month to their home address from DPIL. All books chosen were appropriate for the age group. Volunteers were also given a ‘reading record’ to allow them to record how many sessions each child received.

Wait-List Control Condition

Children in the control condition were not read to by a volunteer but instead remained in the pre-school classroom and accessed typical curriculum activities. The children in the control condition also received one book per month, which was sent to their home address by DPIL.

Outcome Measures

Children’s language skills were assessed using three standardised language assessments:

1. *The British Picture Vocabulary Test, Third Edition* (Dun, Dun, Sewell, Styles; Brzyska, Shamsan, & Burge, 2009; BPVS) is a standardised measure of the receptive vocabulary knowledge of individual children. A word is read to the child and the child must select a picture from four options that matches the word. In the present study we used the raw score on the BPVS as a measure of receptive vocabulary.
2. *The Preschool and Primary Inventory of Phonological Awareness* (Dodd, Crosbie, McIntosh, Teitzel, & Ozanne, 2000; PIPA) is a standardised measure of the phonological awareness skills of individual children. In the present study, we

administered all six sub-tests, which assess the child's ability to detect, isolate, manipulate and convert sound units at the syllable, onset-rime and phoneme levels. We used the total raw score across all subtests as a measure of phonological awareness.

3. *The Clinical Evaluation of Language Fundamentals - Preschool 2 UK* (CELF Preschool-2; Wiig, Secord, & Semel, 2006) is a standardised measure of the language knowledge of individual children. In the present study, we used three subtests, which assess the child's comprehension of sentence structure, word structure and expressive vocabulary. We used the total raw score across all subtests as a measure of receptive and expressive language skill.

Procedure

Preschools in the Merseyside area were approached by Beanstalk and invited to take part. Once the Headteacher had consented, the nursery selected 6 or 12 children to participate in the study. Each child then took part in a pre-intervention testing session. At the pre-intervention session the researcher administered the three standardised language assessments to each child selected to take part by the nursery. Once the language assessments were complete for all children in a nursery, the researcher randomly assigned the children to either the Story Starters intervention group or the wait-list control group, according to CONSORT guidelines (Schulz, Altman, & Moher, 2010).

Randomisation was achieved via the following procedure. Prior to the start of the project a randomisation sequence was generated by an independent researcher, unconnected with the project, with a 1:1 allocation using random block sizes of 6. Blocks were generated with a permuted block design using a computerised random number generator. The allocation

sequence was concealed from the researchers inside sequentially numbered, opaque, sealed and signed envelopes. The piece of paper inside the envelope, which stated the condition assignment, was wrapped in foil to prevent the allocation being visible from the outside of the envelope. Randomisation was within pre-school to ensure equal numbers of children in the intervention and control conditions within each pre-school. After completion of the language assessments a researcher selected a randomisation pack for each school and opened the envelopes bearing each participant's assigned number. The researchers then video recorded themselves opening the envelope to document that the envelope was intact prior to allocation and to record the participant's condition assignment.

The post-intervention testing session (visit 2) took place immediately after the 24-week Story Starter intervention was complete. In this session, the language assessments were repeated by a researcher blind to the condition assignment of each child. Finally, the follow-up testing session (visit 3) took place 24 weeks after the intervention had ended. The language assessments were completed for the final time, again by a researcher blind to the condition assignment of each child.

Video recordings of the volunteers reading with each child were collected during week 12 and week 20 of the intervention. A researcher attended the preschool and set up recording equipment prior to the start of the reading session. The video camera was placed in the corner of the room and left running for the duration of the book reading session. Once the session was complete, the researcher removed the video camera. The video recordings were then coded for the duration and quality of the book reading session, and the volunteer's speech and the child's speech were transcribed (see below for more information about how these sessions were coded).

Dosage and Fidelity

Each volunteer was asked to read twice per week for twenty minutes for 24 weeks. This resulted in a maximum of 48 reading sessions over the 24-week intervention period.

However, the intervention period ran continuously without breaks for school holidays and without ‘make-up’ sessions for sessions missed through absence or school closures. This meant that, in reality, it was not possible for the children to receive as many as 48 reading sessions. The mean number of reading sessions was 28.13 (SD = 5.91, Range = 13 – 39).

Coding of Book Reading Sessions

The video recordings collected in week 12 were coded for the presence of dialogic reading behaviours. Each video was broken down into 30-second segments and researchers coded whether there were dialogic reading behaviours present in each 30-second segment. As the video recordings varied in length, the dependent variable was the proportion of the segments that contained evidence of the target book reading behaviours.

Results

Demographic information was collected from all participants and is summarised in Table 1.

Two one-way ANOVAs were run to test for potential differences in the age and the index of multiple deprivation (IMD) between the participants assigned to the intervention group and the control group. There were no significant differences between the conditions for age of the participants, $F(1, 167) = .94, p = .33$; or index of multiple deprivation, $F(1, 167) = .32, p = .57$

Table 1. *Participant gender, age and index of multiple deprivation (IMD) at the pre-intervention session*

	Age in Months	IMD decile	Girls	Boys
Intervention	45.09 (3.43)	2.16 (1.59)	46	40
Control	44.60 (3.14)	2.31 (1.87)	37	46

Language Measures

Pre-intervention to Post intervention

The first set of analyses examined the gains the children made between the pre-intervention testing session and the immediate post-intervention testing session. Table 2 and Figure 3 shows the mean score on each outcome measure for the intervention and control groups pre- and post-intervention.

Table 2. *Mean (SD) pre-intervention and post intervention scores for the intervention and control conditions for each outcome measure*

		Pre- Intervention Mean (SD)	Post- Intervention Mean (SD)	Gain	N
Intervention	BPVS	43.37 (15.37)	56.7 (15.23)	13.33	86
	PIPA	10.01 (7.72)	20.08 (13.81)	10.07	86
	CELF	32.81 (13.25)	41.69 (13.21)	8.88	86
Control	BPVS	43.05 (14.99)	57.08 (13.77)	14.03	83
	PIPA	9.27 (7.10)	18.80 (13.01)	9.53	82
	CELF	31.35 (12.31)	42.56 (11.73)	11.21	82

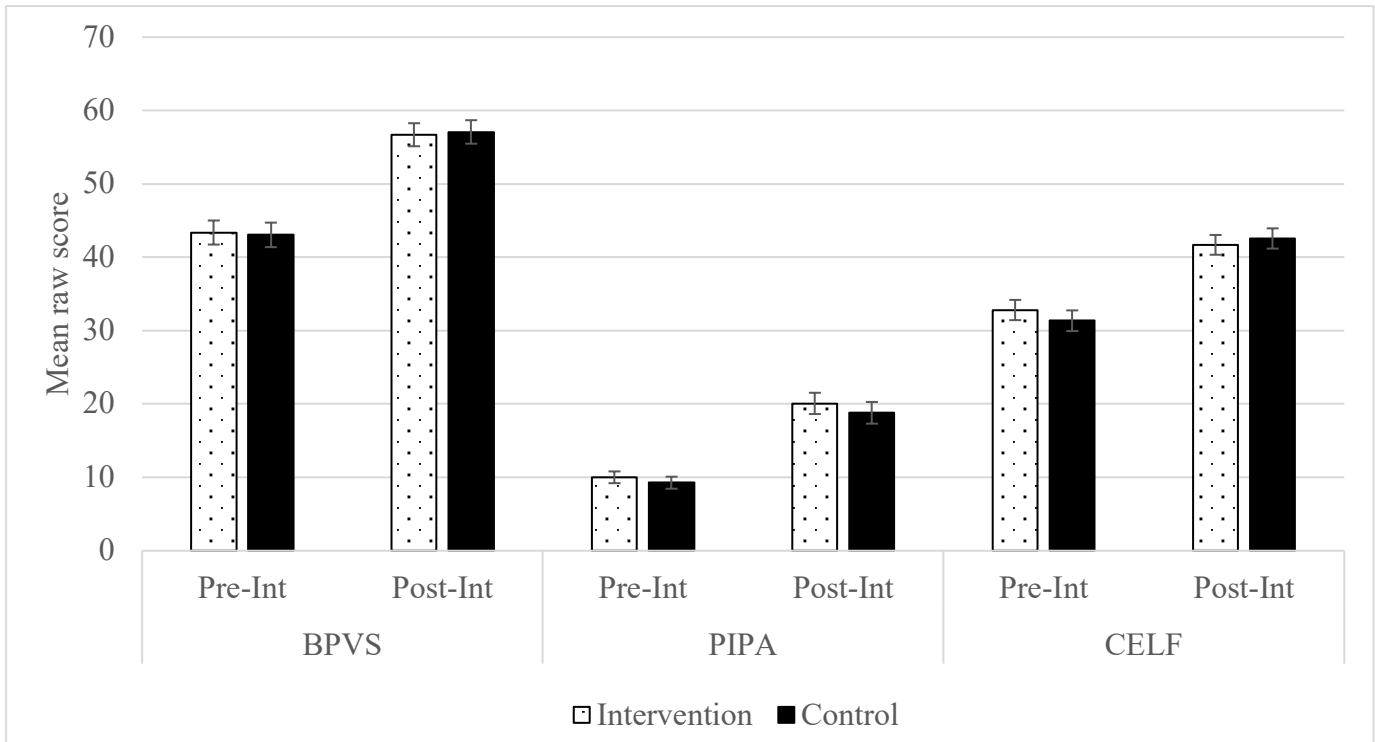


Figure 3. Mean (SE) pre-intervention and post intervention scores for the intervention and control conditions for each outcome measure.

The following analyses investigated whether the children in the Story Starters intervention made significantly larger gains on the language outcome measures than the children in the wait-list control group who did not receive the intervention. A series of 2-way mixed ANOVAs was run with condition (intervention vs. control) and session (pre-intervention vs. post-intervention) as the independent variables and raw score on each outcome measure as the dependent variable.

The British Picture Vocabulary Scale (BPVS: Receptive Vocabulary)

There was a main effect of session, $F(1, 167) = 247.14, p = .001$, with children’s performance on the BPVS improving significantly between the pre-intervention and post-intervention sessions. There was no main effect of condition, $F(1, 167) = .001, p = .99$, and no interaction between session and condition, $F(1, 167) = .167, p = .68$. Children in the intervention did not

show significantly more improvement between the pre-intervention and post-intervention session than children in the control group.

The Preschool and Primary Inventory of Phonological Awareness (PIPA: Phonological Awareness)

There was a main effect of session, $F(1, 166) = 147.89, p = .001$, with children's performance on the PIPA improving significantly between the pre-intervention and post-intervention sessions. There was no main effect of condition, $F(1, 166) = .474, p = .49$, and no interaction between session and condition, $F(1, 166) = .109, p = .74$. Children in the intervention did not show significantly more improvement between the pre-intervention and post-intervention session than children in the control group.

Clinical Evaluation of Language Fundamentals (CELF: Expressive and Receptive Language Skills)

There was a main effect of session, $F(1, 166) = 273.95, p = .001$, with children's performance on the CELF improving significantly between the pre-intervention and post-intervention sessions. There was no main effect of condition, $F(1, 166) = .25, p = .88$, and no interaction between session and condition, $F(1, 166) = 3.71, p = .06$. Children in the intervention did not show significantly more improvement between the pre-intervention and post-intervention session than children in the control group.

Pre-intervention – Follow-up

The second set of analyses examined the gains the children made between the pre-intervention testing session and the follow-up testing session, 6 months after the end of the intervention. Table 3 and Figure 4 show the mean score on each outcome measure for the intervention and control groups pre-intervention and at follow-up.

Table 3. Mean (SD) pre-intervention and follow up scores for the intervention and control conditions for each outcome measure

		Pre-Intervention	Follow up	Gain	N
		Mean (SD)	Mean (SD)		
Intervention	BPVS	43.59 (15.63)	65.47 (15.17)	21.88	76
	PIPA	10.16 (8.03)	35.91 (14.53)	25.75	76
	CELF	33.01 (13.48)	50.21 (11.85)	17.2	76
Control	BPVS	43.07 (14.84)	64.98 (12.82)	21.91	81
	PIPA	9.17 (7.16)	32.65 (13.49)	23.48	81
	CELF	31.56 (12.26)	49.63 (11.05)	18.07	81

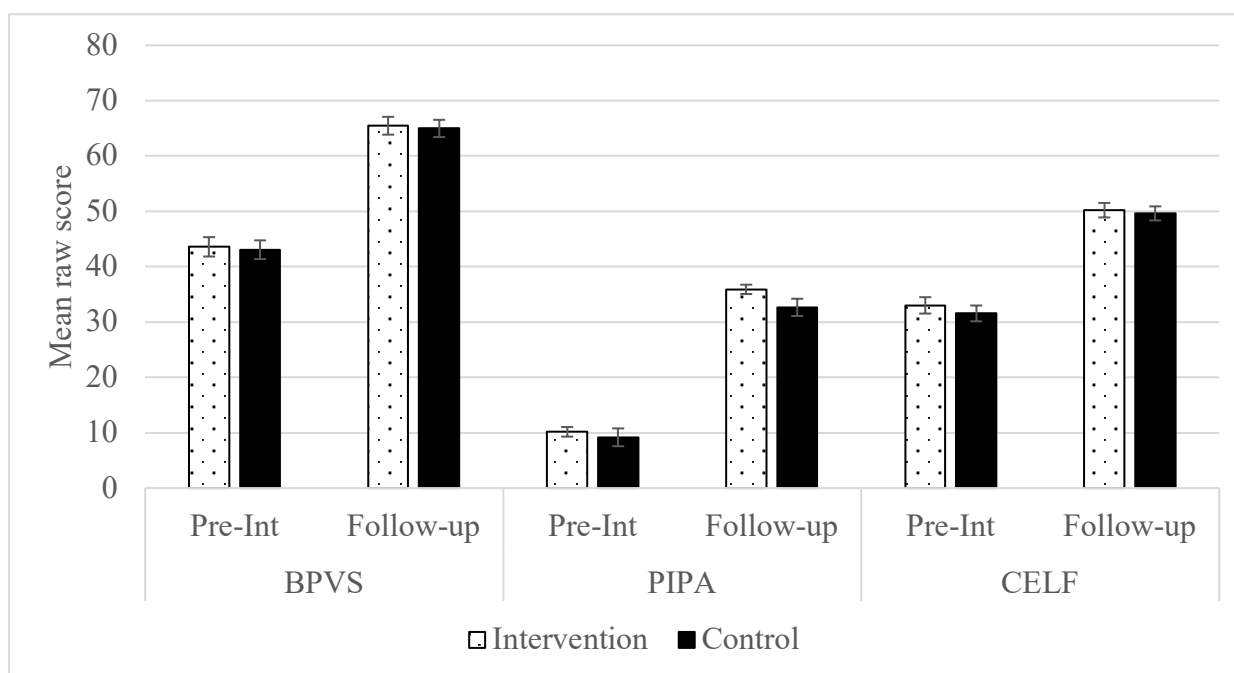


Figure 4. Mean (SE) pre-intervention and follow-up scores for the intervention and control conditions for each outcome measure.

The following analyses investigated whether the children in the Story Starters intervention made significantly larger gains on the language outcome measures than the children in the wait-list control group who did not receive the intervention. A series of 2-way mixed ANOVAs was run with condition (intervention vs. control) and session (pre-intervention vs. follow-up) as the independent variables and raw score on each outcome measure as the dependent variable.

The British Picture Vocabulary Scale (BPVS: Receptive Vocabulary)

There was a main effect of session, $F(1, 155) = 532.193, p = .001$, with children's performance on the BPVS improving significantly between the pre-intervention and post-intervention sessions. There was no main effect of condition, $F(1, 155) = .057, p = .81$, and no interaction between session and condition, $F(1, 155) = .001, p = .99$. Children in the intervention did not show significantly more improvement between the pre-intervention and post-intervention session than children in the control group.

The Preschool and Primary Inventory of Phonological Awareness (PIPA: Phonological Awareness)

There was a main effect of session, $F(1, 155) = 686.85, p = .001$, with children's performance on the PIPA improving significantly between the pre-intervention and post-intervention sessions. There was no main effect of condition, $F(1, 155) = 1.91, p = .17$, and no interaction between session and condition, $F(1, 155) = 1.46, p = .23$. Children in the intervention did not show significantly more improvement between the pre-intervention and post-intervention session than children in the control group.

Clinical Evaluation of Language Fundamentals (CELF: Expressive and Receptive Language Skills)

There was a main effect of session, $F(1, 155) = 479.77, p = .001$, with children's performance on the CELF improving significantly between the pre-intervention and post-intervention sessions. There was no main effect of condition, $F(1, 155) = .33, p = .57$, and no interaction between session and condition, $F(1, 155) = .296, p = .59$. Children in the intervention did not show significantly more improvement between the pre-intervention and post-intervention session than children in the control group.

Summary

The analyses indicate that, although both the intervention and control children made significant progress over the course of the study, the children in the intervention group did not make significantly larger gains on any of the language outcome measures than the children in the wait-list control group. There is therefore no evidence that the Story Starter intervention boosted the language skills of the children in the current study.

Fidelity Analyses

The next set of analyses examined the role of fidelity. We collected two measures of fidelity to the intervention, 1) the number of sessions each child in the intervention group received, and 2) the quality of the sessions at week 12. These fidelity measures allowed us to explore whether the number and quality of sessions had any impact on the gains made by the children in the intervention group.

Number of sessions

We have fidelity information regarding the number of sessions received for 83 of the 86 intervention participants. The maximum possible number of sessions a child could receive was 48 (24 weeks, two sessions per week). However, no child received this number due to school holidays, and child and volunteer absences. The mean number of sessions was 28.13 (SD: 5.91, Range: 13 - 39).

Correlations

Pearson product-moment correlation coefficients were computed to assess whether there was a relationship between the number of sessions received and the gains the children made on the language measures between the pre-intervention and immediate post-intervention testing sessions. There were no significant correlations between the number of reading sessions the child received and the gains made on the BPVS, $r(81) = -.11, p = .32$, the PIPA, $r(81) = .16, p = .15$, or the CELF, $r(81) = -.04, p = .72$.

Summary – Number of sessions

There is no indication that the number of sessions a child received had an impact on the gains the child made on any of the language measures.

Quality of sessions

We have fidelity information regarding the quality of the sessions received in Week 12 for 60 of the 86 intervention participants. Table 4 provides information about the quality of the sessions in terms of the proportion of the session that included dialogic reading behaviours.

Table 4. Mean proportion of the session with evidence of dialogic reading at week 12

	Mean (SD)	Minimum	Maximum	N
Proportion	.63 (.20)	0.03	1	60

Correlations

Pearson product-moment correlation coefficients were computed to assess whether there was a relationship between the quality of the sessions received at week 12 and the gains the children made on the language measures between the pre-intervention and immediate post-intervention testing sessions. There were no significant correlations between the quality of the reading sessions in week 12 and gains made on the BPVS, $r(58) = -.01, p = .92$, the PIPA, $r(58) = .14, p = .30$, or the CELF, $r(58) = .004, p = .98$.

Summary – Quality of sessions

There is no indication that the quality of the sessions the children received (as indexed by the quality of the week 12 sessions) had an impact on the gains the child made on any of the language measures.

Conclusions

This randomised controlled trial investigated whether Story Starters, a shared book reading intervention, would result in gains on a range of language skills in pre-school aged children. The findings indicate that Story Starters did not boost pre-school aged children’s language skills. Children in the Story Starters intervention group did not make significantly larger gains on any of the language outcome measures than the children in the wait-list control group. In addition, our fidelity analysis revealed that, although there was variation in the fidelity with which the intervention was delivered (both in terms of the number and the

quality of the reading sessions that were delivered), this variation did not predict differences in the amount of progress made by the children in the intervention group. There is therefore no reason to conclude that increasing the number or quality of the sessions provided by volunteers would increase the effectiveness of the intervention. These results are obviously disappointing, but they do illustrate how difficult it can be to intervene effectively to increase children's language skills, particularly in a context in which the population as a whole is already receiving substantial support in the form of high quality nursery provision, and against a background in which even the language skills of the control group are developing quite rapidly. In short, there are no guarantees that even well-designed interventions will have positive effects on children's language skills, and it is essential that the effects of such interventions are properly evaluated using an RCT methodology.

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