Exploring the impact of a story-based teacher training programme on language and early literacy in 4- and 5-year-olds

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Child characteristics, and teacher, classroom and home variables that predict improvements in language and literacy

This is the fifth in a series of five research briefs that explore the impact of a story-based teacher training programme on language and early literacy in 4- and 5-year-olds. This brief explores the impact of the intervention and the extent to which child characteristics, home learning environments, and teacher and classroom variables predict improvements in children's language, literacy and overall development.

Measures used in the study

We described the characteristics of the sample in research brief 1, and in research brief 4 we detailed the children's performance on the **Early Learning Outcomes Measure (ELOM)**. To supplement the ELOM assessment, we also used additional language- and literacy-related assessments described below.

Narrative skill

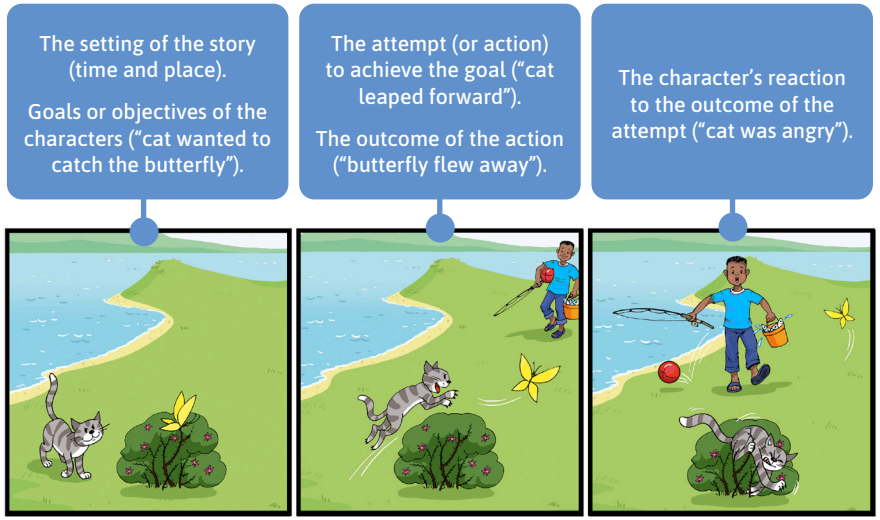
Early narrative skills (ages 3–6 years) are predictive of later literacy-related skills such as reading comprehension and written narratives.[1] Although children's early narratives may simply involve describing actions, as their narrative skills develop, they start to:

- give context to their stories (characters and settings)
- describe events in order (temporality)
- explain how one event influenced another (causality)
- take the perspective of different characters
- make inferences about characters' goals, intentions and responses to events

In our study we used two parallel stories from the **Multilingual Assessment Instrument for Narratives (MAIN)** which was developed to assess narrative skills in multilingual populations and in children from diverse cultural backgrounds.

We showed children two pictures at a time from a six-picture sequence, and asked them to tell the story. Stories were recorded, transcribed and scored for the number of story structure elements.

Here are examples of some of the story structure elements in the first part of the MAIN 'cat' story.



We also assessed children's understanding of the story (narrative comprehension) using 10 open-ended questions focusing on the goals and internal states of characters.

[1] Language and Reading Research Consortium, & Chiu, Y. D. (2018). The simple view of reading across development: The prediction of grade 3 reading comprehension by prekindergarten skills. *Remedial and Special Education*, 39, 289–303; Silva, M., & Cain, K. (2015). The relations between lower and higher level comprehension skills and their role in prediction of early reading comprehension. *Journal of Educational Psychology*, 107(2), 321–331.

Vocabulary

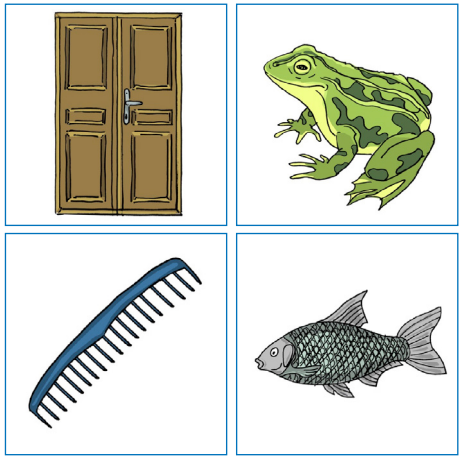
Research has shown that young children who know the meanings of more words at age five are also likely to score well on reading comprehension tests in grades 3, 4 and even 7.[2]

We assessed children's vocabulary on two different tasks:

- Task 1 (Baseline): We used the **Cross-Linguistic Lexical Task (CLT)**, which was developed as a cross-linguistically and cross-culturally comparable tool for assessing children's *receptive and expressive vocabulary*.
- Task 2 (Endline): We used a self-developed vocabulary assessment to test children's knowledge of the *target words* that were taught in the programme.

Here are some examples from the CLT test (we used similar methods in the self-developed test). For *vocabulary comprehension*, children were shown a set of pictures and asked to choose the picture that matched the word spoken by the assessor.

Where is the frog?



Who is jumping?

For *vocabulary production*, children were shown a picture and prompted to name the object or the action.

What is this?

What is the girl doing?

Answers were scored correct if the child provided the correct target word, a regional variant, a word that was more specific than the target word, a mispronunciation, a loan word or an English version of the target word.

Print awareness/Concepts about print

To assess children's familiarity with books, we used items from the Early Literacy Protocol (ELP).[3] Children were given a book and the assessor asked questions such as: "Where is the front of the book?", "Where is the name of the story?", "Where do you start reading?".

Phonological awareness

Phonological awareness is the ability to pay attention to sounds in spoken words. Together with letter-sound knowledge, it is a strong predictor of literacy development.[4] We adapted the ELP to assess children's ability to:

- break up a word into syllables ("The word 'soccer' has 2 claps. Now you clap for 'elephant'.")
- blend syllables to make a word ("I'll say parts of a word. You guess what the word is.")
- hear the first sound in a word ("I am going to say a word and you must tell me what sound the word starts with.").[5]

We knew that the children in our study might not be familiar with these types of tasks and included practice items for each.

[2] Sénéchal, M., Ouellette, G., & Rodney, D. (2006). The misunderstood giant: On the predictive role of early vocabulary in future reading. In D. Dickinson & S. Neuman (Eds), *Handbook of Early Literacy Research*, Vol. 2 (pp 173–184). New York, NY: Guilford Press.

[3] This test was developed by the Stellenbosch University Division of Speech, Language and Hearing Therapy.

[4] Kendeou, P., van den Broek, P., White, M. J., & Lynch, J. S. (2009). Predicting reading comprehension in early elementary school: The independent contributions of oral language and decoding skills. *Journal of Educational Psychology, 101*(4), 765–778.

[5] The ELP has a phoneme oddity task that is similar to Item 26 in ELOM and we replaced this with a phoneme identification task.

Results

Research Question 1:

Relative to a control group, does the Little Stars story-based intervention result in gains in children's early development and specific language and early literacy skills?

Implementation quality: a measure of the extent to which teachers in the intervention group implemented the Little Stars programme as intended and as rated by the Wordworks trainer.

Implementation quality significantly predicted improvements in:

- ELOM total score, and cognition and executive functioning (CEF)
- literacy-related skills directly targeted in the intervention (narrative production and print awareness).

This means that in classrooms where teachers implemented the Little Stars programme well/effectively, children made greater gains on these measures, compared to classrooms where the programme was not implemented or not implemented as intended. Children who benefitted from the Little Stars programme improved by 3 to 5 months of overall development on the ELOM (over and above maturation of 6 months).[6]

Implementation quality also significantly predicted children's scores on a test of vocabulary taught in the programme, which means that children who experienced good implementation of the programme learnt more new words compared to classrooms where the programme was not implemented or not implemented as intended.

Implementation quality did not predict progress in narrative comprehension and phonological awareness.

Research Question 2:

Did children's characteristics and home learning environments predict improvements in outcomes?[7]

Child characteristics: age, gender, height for age (as an indicator of child's growth and nutritional status), socio-emotional functioning (SEF), and baseline vocabulary scores.

Home learning environment (HLE):

- activity – the total amount of time that caregivers reported spending on different activities;
- time – the total amount of time that caregivers reported having to spend time with their children during the week and on weekends;
- resources – the total number of books and toys in the home.

Child characteristics

Age only predicted progress on one task – narrative comprehension: the youngest children improved the most on this task, perhaps because they had the greatest room for improvement.

For both language groups, baseline vocabulary was significantly related to endline vocabulary test scores: the number of target words the children learned from the programme.

Home learning environment

Children who had fewer home learning resources made greater gains in overall development (ELOM total score). Children whose parents/caregivers reported spending more time with them during the week and on weekends made greater gains, specifically in ELOM emergent language and literacy scores.

[6] The average contribution of the programme was 3.59 ELOM points and optimal programme delivery equated to 5.04 ELOM points.

[7] All variables not reported on were non-significant predictors.

Research Question 3:

Did classroom and teacher variables predict improvements in outcomes?

Teacher/classroom variables: early childhood development (ECD) centre fee levels; class size; practitioner qualifications, age and experience; language of instruction; and quality of teaching (as measured by observational rating scales).

The analysis showed that the following variables predicted children's progress:

- Lower ECD centre fees were associated with greater gains in two ELOM domains, suggesting that children from more deprived contexts received greater relative benefits.
- In the classrooms with the best overall quality of teaching (as measured by the literacy subscale of the ECERS-E),[8] children made the greatest gains in narrative production and overall development (ELOM total score).
- Children in smaller classes made greater gains on ELOM emergent language and literacy scores, and in oral narrative skills.
- There was no consistent pattern for the two variables associated with teacher experience (age and years spent teaching).
- Children in Afrikaans and isiXhosa classes made similar gains across all assessment tasks, except for ELOM emergent numeracy and maths scores, and phonological awareness,[9] where the Afrikaans-speaking children made greater gains than isiXhosa-speaking children.

Summary and implications of findings

The key findings from the study related to the intervention:

- Children who experienced good implementation of the programme improved in language and early literacy skills targeted by the programme (narrative production, print awareness and vocabulary taught in the programme), as well as overall development (most likely driven by improvements in cognition and executive functioning).[10] These improvements were significantly greater than in classrooms where the programme was not implemented, or not implemented effectively.
- The quality of programme implementation did not have a significant effect on phonological awareness and narrative comprehension. An improvement in phonological awareness may require more focused teaching time (there was one phonological awareness activity within each two-week teaching cycle and some additional activities linked to selected stories).

In addition, the following factors predicted gains (regardless of whether or not children were in an intervention classroom):

- Greater relative benefits were found for children from more deprived contexts (those with fewer resources at home and those attending centres with lower monthly fees).
- Children's age only predicted gains on one outcome measure; and of note, no child variables predicted gains in ELOM total scores. This suggests that these 'within-child' variables are less important than contextual teacher, classroom and home variables.
- Children's vocabulary knowledge at the start of the intervention was associated with their acquisition of new vocabulary, which points to the importance of strengthening the language learning environments of very young children.

[8] Sylva, Siraj-Blatchford, I., Taggart, B., & Sylva, K. (2010). *ECERS-E: The Early Childhood Environment Rating Scale curricular extension to ECERS-R* (3rd ed.). Trentham.

[9] Afrikaans children had lower baseline scores for syllable blending so there was more room for improvement. For the phoneme identification task, the isiXhosa children's scores were lower at pretest and they made limited progress. This low performance on phoneme level tasks is in line with other South African studies of children a year older than this sample.

[10] In addition to targeting language and early literacy skills, the programme targets teacher-child interaction, and this has been linked to better overall child outcomes. The programme includes a 'learning to listen' activity that targets auditory processing, working memory and inhibitory control (assessed in the CEF domain).

Summary and implications of findings continued ...

- Children whose parents reported spending more time with them made greater gains on ELOM emergent language and literacy scores. This is an important finding, as the quality of implementation of the programme did not predict gains on this outcome measure. It suggests that the amount of engagement at home is vital for language development, and that **early interventions that include parents are likely to have a greater impact on language development than classroom interventions alone**.
- Quality of teaching matters; children with teachers who were rated higher on an observational rating scale made the greatest gains in narrative skill and overall development.
- Smaller classes predicted gains in two language measures. This may be because there is a greater opportunity for more frequent teacher-child interaction with fewer children in the class.
- Language of instruction was linked to greater gains and higher scores on some measures. The differences between language groups may reflect these differences in the children's contexts for learning (the Afrikaans ECD centres generally charged higher fees and had more experienced teachers, and caregivers in the Afrikaans sample also reported spending more time with their children).

Overall, this study contributes to our understanding of the many variables that influence young children's development and learning. While the variables independently predicted different outcomes, it is important to keep in mind that some variables are related to others. For example, children who had a greater variety of resources in their home and whose parents spent more time engaging in learning activities were also more likely to attend ECD centres with higher fees and with teachers who were more experienced and who scored higher on a measure of teaching quality.

The results suggest that **over and above contextual variables that influence learning, a targeted early language programme can impact overall development, as well as aspects of language development that are linked to reading in later years**.

The gains made by children over a 6-month period provide evidence of the potential for early learning programmes to improve learning outcomes for our poorest children. Previous research demonstrated this potential for well-functioning early learning programmes, and this study extends the evidence to a curriculum-focused intervention in a random sample of centres not controlled for programme quality.[11] **The true value of the study is that it was conducted in a 'real world' context, with low-cost resources, training delivered by NGO trainers, and a sustainable training-of-trainers model for scale**.

With only 45% of 4–5-year-olds in South Africa 'on track' for early learning, we have an early learning crisis, that is in turn contributing to our literacy crisis at school level. This study shows that programmes like Little Stars can ensure that more children meet vital early development benchmarks and are 'on track' to realise their potential.

[11] The gains in ELOM total scores are comparable with one of the well-functioning early learning programmes selected for the Early Learning Programmes Outcome (ELPO) study.

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