

# Implicit learning of macrostructure elements in a small group intervention study

Ntalli, A.<sup>1</sup>, Mirkovic, J.<sup>2</sup>, Pydah, A.<sup>3</sup>, Shetty, A.<sup>4</sup>, Pandith, P.<sup>4</sup>, Usha, M. N.<sup>4</sup>, Nagendra, S.<sup>4</sup>, Kala, B.<sup>4</sup>, Chandana, S.<sup>4</sup>, Arulmani, G.<sup>4</sup> and Nag, S.<sup>1</sup>

<sup>1</sup>University of Oxford and <sup>2</sup>York St John University, UK; <sup>3</sup>Independent Researcher and <sup>4</sup>The Promise Foundation, India

## Introduction

- ❖ Strong oral language skills are fundamental for literacy development when children start school, and for later academic achievement and life outcomes (Adlof & Hogan, 2019).
- ❖ Implicit learning mechanisms play a key role in oral language acquisition throughout childhood (Aslin, 2017; Romberg & Saffran, 2010), from learning individual speech sounds (e.g. Maye et al., 2002) to learning syntactic structures (e.g., Kidd, 2012).
- ❖ In the current study, we examine the role of implicit learning in spoken narratives in multilingual children where the target language (Kannada) was a first or an additional language.

## Aims

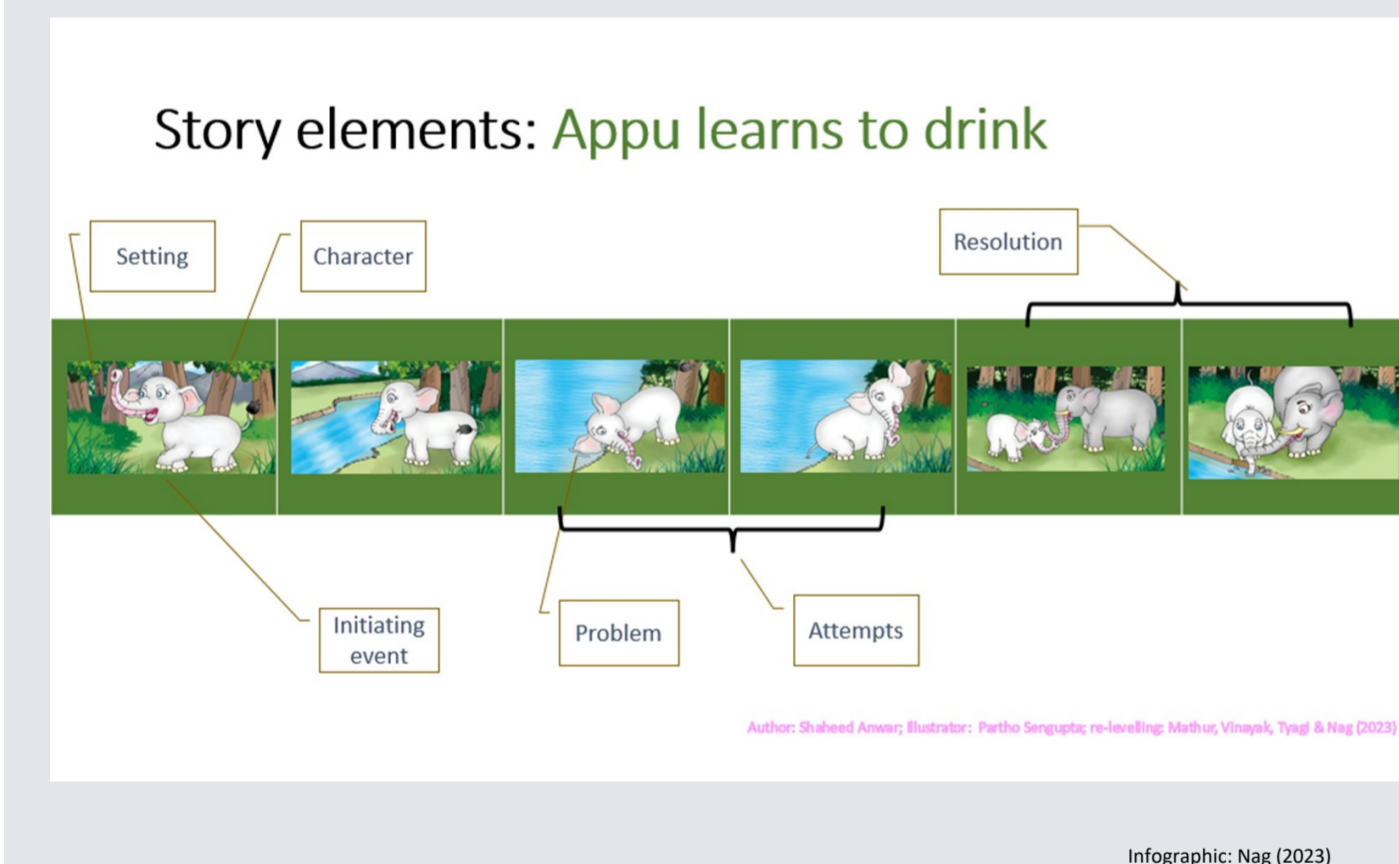
- ❖ We designed a story-based oral language intervention to examine the role of repeated exposure to structured narratives and targeted syntactic structures and the role of questions in enhancing their use.

## Research Design



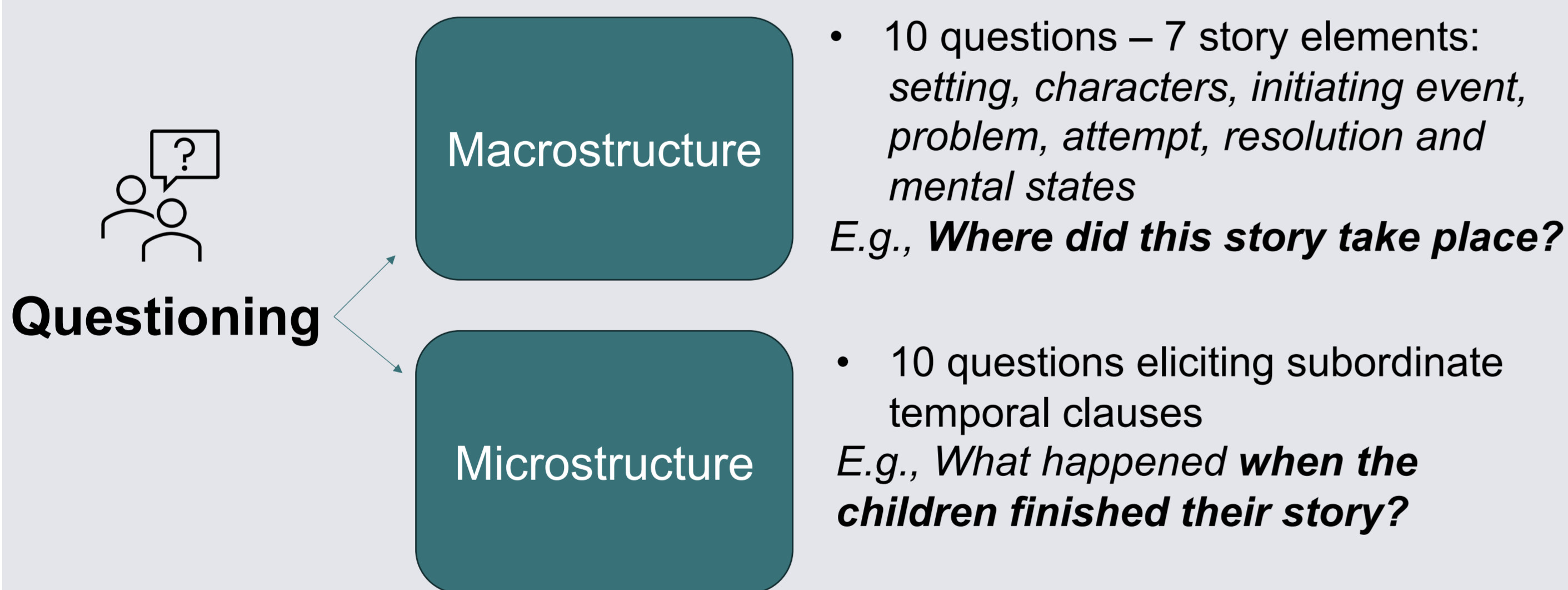
### The lesson plan for each intervention session:

🧠 Focusing → 📖 Story reading → 🗣️ Questioning → 🧘 Stretching



### The story reading activity

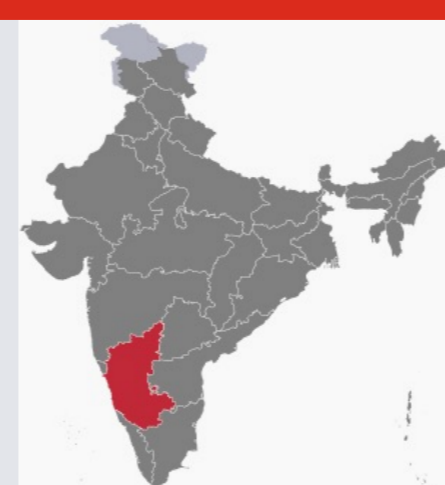
- ❖ 14 stories (order was rotated across 14 participant groups)
- ❖ Stories had the same story grammar (macrostructure).
- ❖ Story scripts rich in subordinate temporal clauses (15-17 instances per story).
- ❖ Stories culturally appropriate, richly illustrated and re-scripted for the intervention.



- ❖ **Study Design:** Latin square design
- ❖ **Intervention:** in 5 sessions story reading was followed by macrostructure questions and in 5 with questions targeting microstructures. Half the groups were exposed to macrostructure questions first and microstructure afterwards and the order reversed for the other half.
- ❖ **Test:** Story retelling at pre- (T1), mid- (T2) and post-test (T3), and one month follow-up (T4).
- ❖ **Background measures:** home survey for family socio-economic status (SES) and the language of books-at-home; child language assessment using a Picture Vocabulary & Sentence Repetition task (Nag, in preparation).

## Participants

- ❖ 87 children (mean<sub>age</sub> in months = 76; SD= 6.1) from schools in four locations across Karnataka in southern India
- ❖ With Kannada as one of their school languages



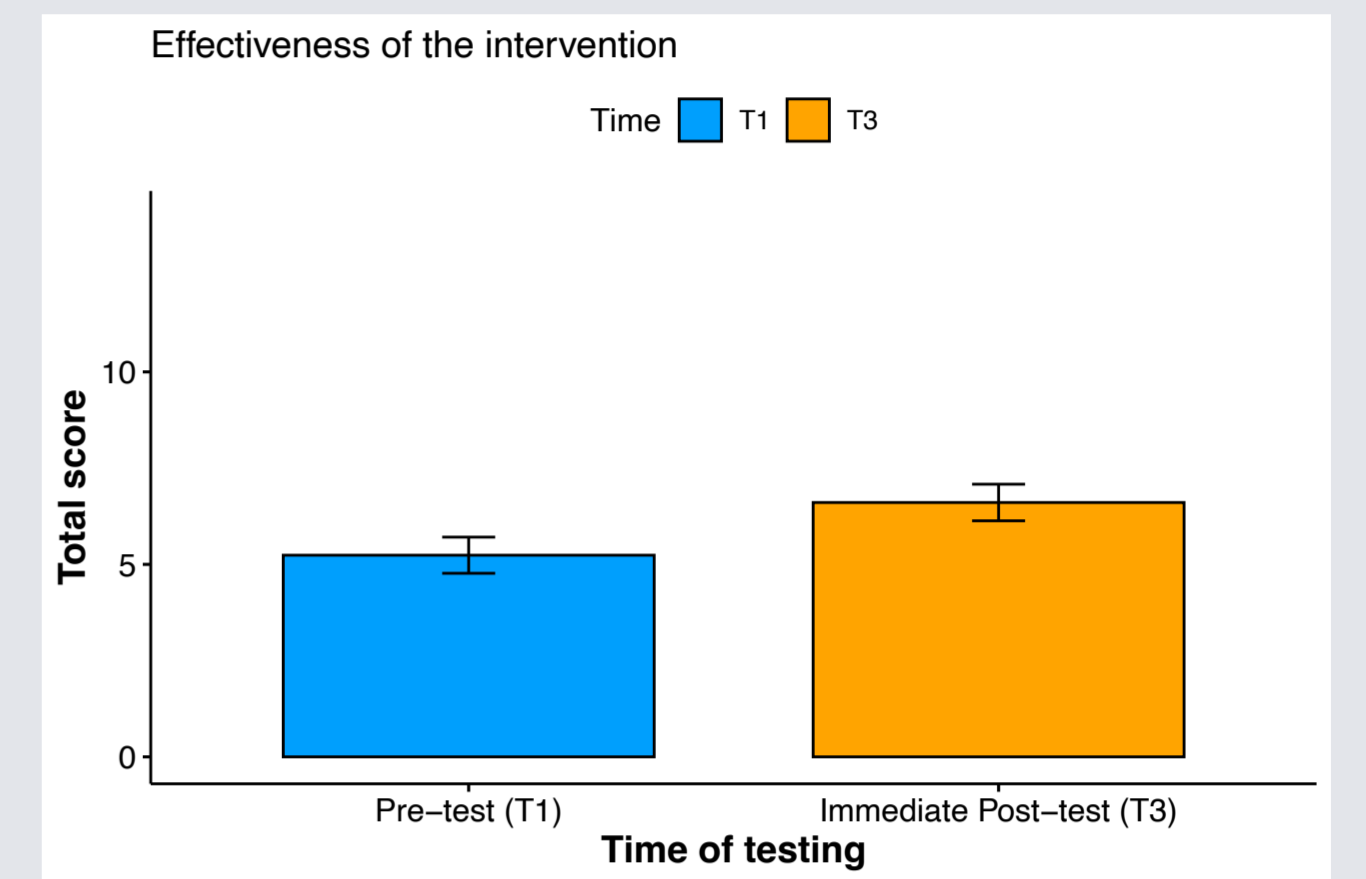
## Research Questions and Results

**Macrostructure scoring scheme:** 0 (no element produced), 1 (element produced), 2 (element produced and elaborated = linked to another element). **Total macrostructure score:** the sum of scores for each of the 7 elements.

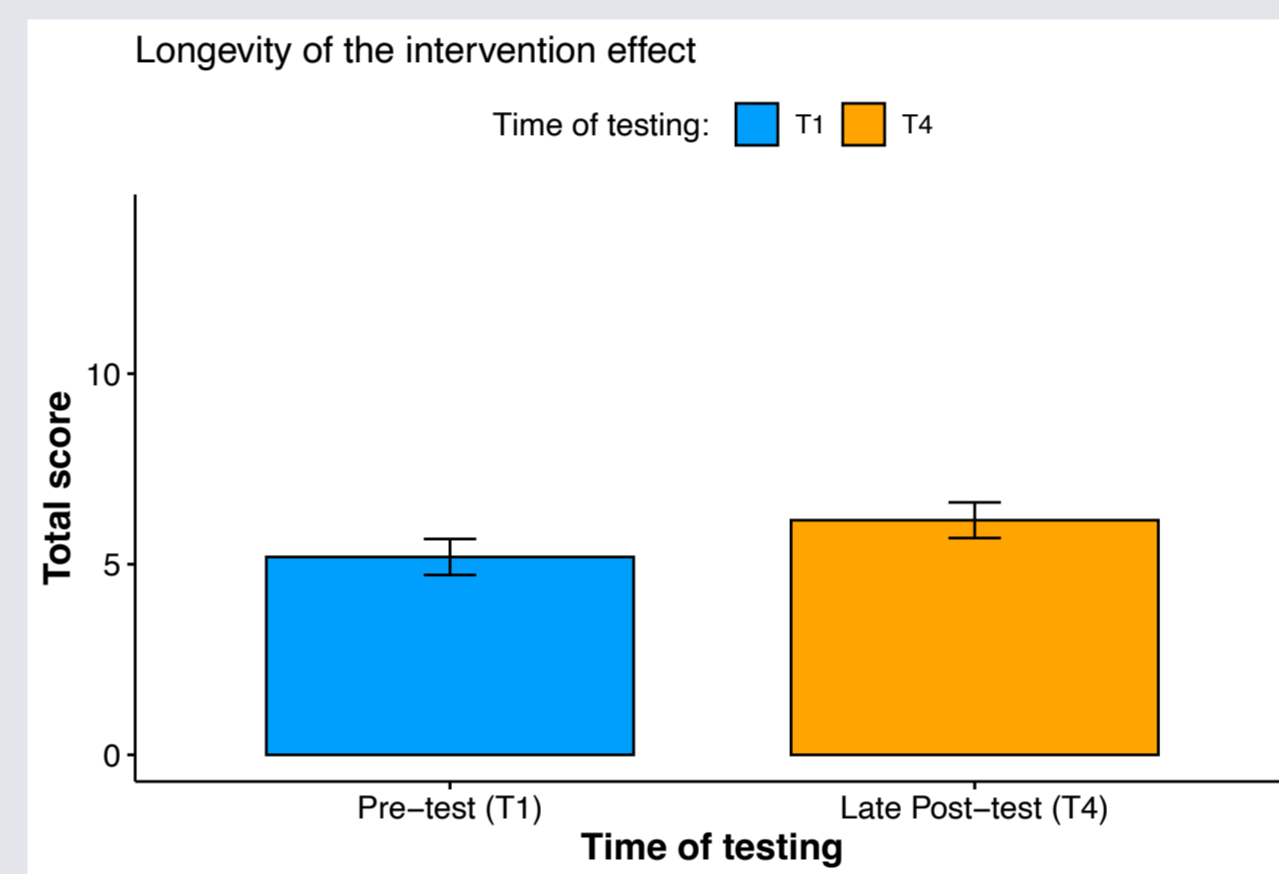
**RQ1.** Is the intervention effective in enhancing the narrative structure (story grammar)?

- Children did significantly better in T3 compared to T1.

	Estimate	SE	t.value	p.value
Time	1.504	0.416	3.612	0.000



**RQ2.** Does the intervention still have an effect one month after it has finished?



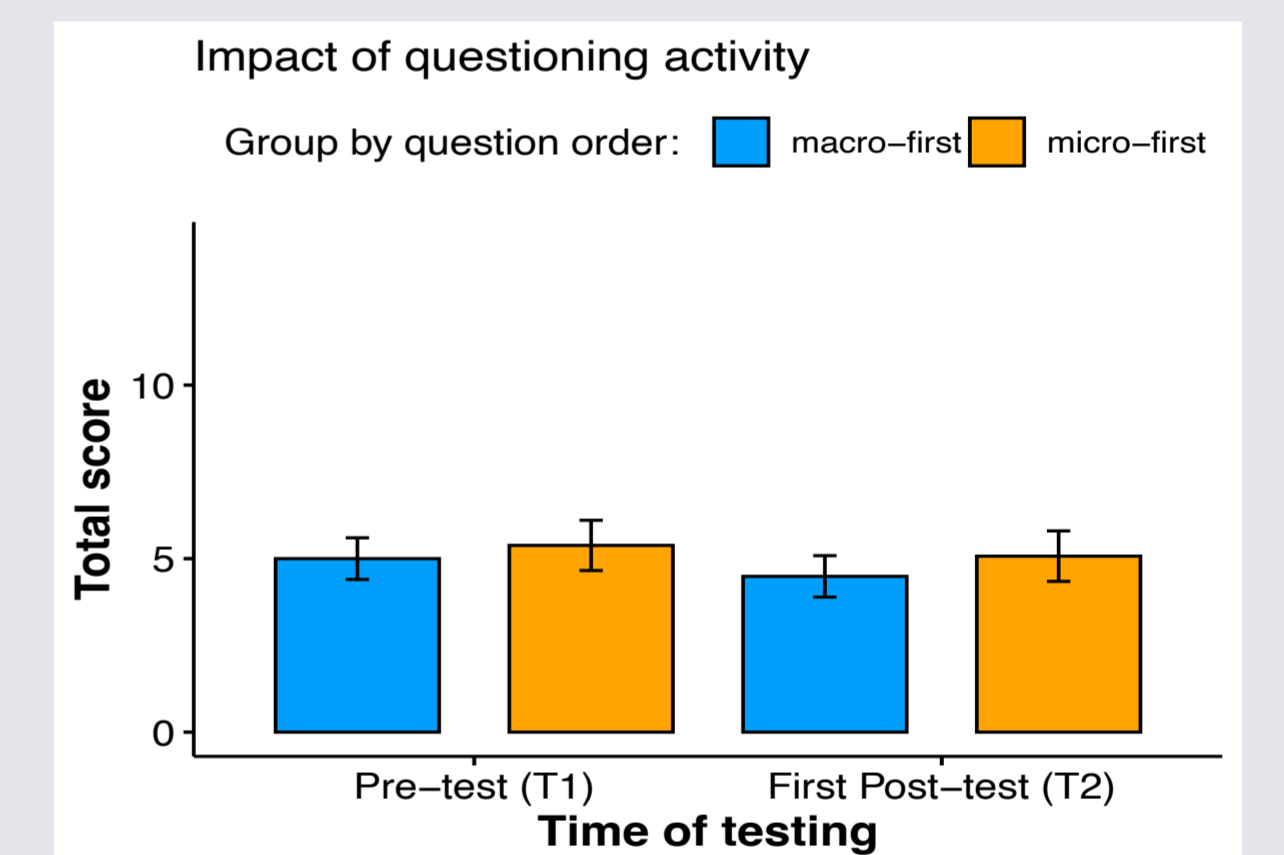
- Children did significantly better in T4 compared to T1; hence intervention effect holds over the short term of one month.

	Estimate	SE	t.value	p.value
Time	1.028	0.444	2.314	0.021

**RQ3.** What is the impact of the questioning activity?

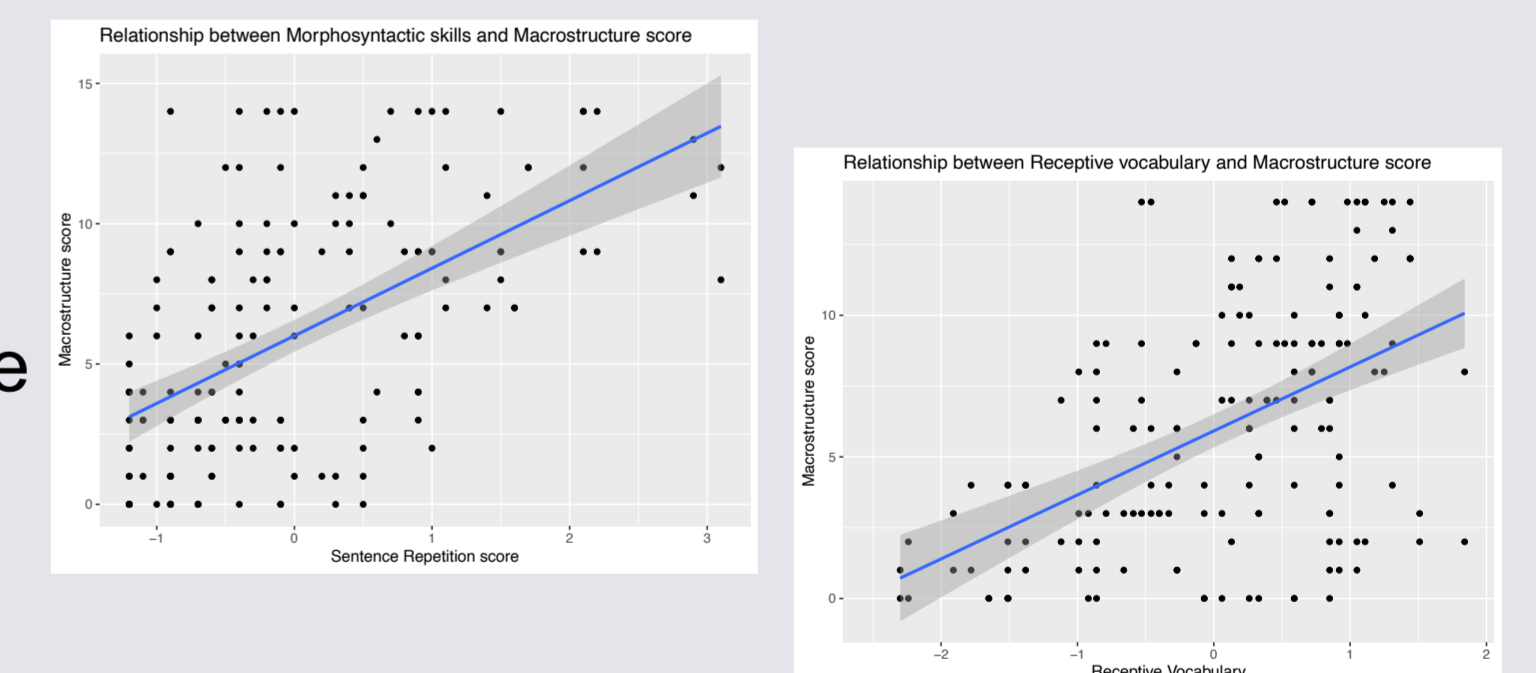
- There was no significant difference between children who were first asked the questions targeting macrostructure and those that were first asked the questions eliciting microstructure.

	Estimate	SE	t.value	p.value
Time	0.505	0.839	0.602	0.547
Ques. Type	-0.467	0.398	-1.173	0.241
Time:Question Type	-0.796	1.434	-0.555	0.579



**RQ4.** Are the intervention effects modulated by maternal education and proportion of Kannada reading materials out of all reading materials at home and/or by the child's pre-existing language skills?

- Children's pre-existing Kannada skills were significant predictors of children's total macrostructure score in both T1 and T3. Maternal education and Kannada print at home were not.



## Discussion

- ✓ This study adds to the growing body of literature showing that structured input and systematic opportunity for language production (through story re-telling) can enhance children's narrative skills at the macrostructure level, and the effect seems to maintain over time.
- ✓ The type of questioning activity was not found to be more effective at T2. Contrary to our expectations (after Silva, Strasser & Cain, 2014, Silva & Cain, 2019), the macrostructure questions first group did not perform better, either because there were only 5 sessions prior to T2 assessment, or the programme was with multilingual children with a varied level of proficiency in the intervention language.
- ✓ Children's prior language skills were predictive of their total score in macrostructure while factors at home were not.

## References

- For references, please scan the QR code.

