Oral narrative comprehension and general cognitive skills of children from underprivileged contexts in Indian state schools

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It is quite well established that children from low-SES backgrounds in India often struggle with reading and reading comprehension (www.asercentre.org; Menon et al., 2017), possibly in part due to lack of parental education/stimulation or additional literacy support at home. At the same time, these children are often linguistically very rich, growing up with multiple languages and in a sociolinguistically diverse environment (Tsimpli et al., 2020). Oral language comprehension of narratives - unlike reading comprehension - is a skill that is acquired and does not need to be explicitly taught. It is therefore conceivable that the sociolinguistically diverse environment that these children grow up in contributes to their world knowledge and monitoring skills, all relevant for successful oral comprehension (Block & Duffy, 2008) of story structure and characters' mental states. Finally, there is some evidence that bilingualism can boost cognitive skills (e.g., Bialystok, 2009), but may be a disadvantage when it comes to linguistic abilities such as vocabulary knowledge (Oller et al., 2007). In the current study, we aim to examine the relation of oral comprehension of narrative macrostructure with bilingualism and general cognitive abilities. We hypothesize that oral comprehension skills are positively affected by bilingualism and general cognitive skills in a large cohort of children from disadvantaged but sociolinguistically diverse backgrounds in India.

702 children (mean age 9;1, SD 1;0, range 7-15) from low-SES backgrounds attending government schools participated in the study: 278 from Delhi and 424 from Patna. All children performed the Raven's Coloured Progressive Matrices task (a measure of general or fluid intelligence; Raven et al., 2008) and a narrative comprehension task from the MAIN (Gagarina et al., 2012) in the regional language - Hindi. The task includes questions on two types of macrostructure elements - *goals* of events and *internal state*s as initiating events or reactions to them; see Table 1. Children were classified as bilingual when they were growing up with more than one language at home. Linear model analyses were used to investigate the effect of bilingualism, Raven's score, and question type on oral narrative comprehension scores. Gender and age did not improve the model fit. The official medium of instruction in school (Hindi (in Patna) vs. English (in Delhi)) improved the model and was thus included.

The children scored an average of 80% correct on the narrative comprehension task. Interestingly, bilingualism was non-significant ($ß$ = 0.76; t = 0.76; p = 0.45; Fig. 1, left). In contrast, a significant effect of Raven's score was found ($ß$ = 0.50; t = 5.85; $p < 0.001$), indicating that children with higher scores on the Raven's task also scored higher on the narrative comprehension task (Fig. 1, middle). Children performed better on *goal* questions (ceiling level) than on *internal state* questions ($ß$ = 15.17; t = 16.25; $p < 0.001$; Fig. 1, right). Finally, children in Patna attending Hindi medium of instruction schools outperformed those in Delhi attending English medium schools ($ß$ = 19.24; t = 18.53; $p < 0.001$), although Hindi is the regional language in both cities.

In sum, these low-SES Indian children did not seem to benefit from or be disadvantaged by bilingualism at home, but did benefit from being taught in the regional language - Hindi - in school when it comes to oral comprehension in Hindi. In addition, oral comprehension is positively associated with general cognitive skills. Finally, most children were able to follow the story structure perfectly (i.e. answer goal questions), whereas they performed less well on *internal state* questions. Overall, these results suggest that Hindi-language schools are better for low-SES Indian children's oral comprehension development in this regionally dominant language. The results furthermore encourage teachers to take into account individual differences in cognitive skills as well as the type of information conveyed in a story to optimally aid oral comprehension development.

Table 1. Example questions accompanying the six-picture story about a cat (in Hindi, with English translations and English responses). There were 9 questions in total.

	Correct responses	Wrong responses	Question type
1. बिल्ली आगे क्यों कूदी ? Why does the cat jump/leap forward? (point to pictures 1-2)	wants/to get the butterfly	she is leaving/running/wants to jump	*goal*
2. बिल्ली क्या महसूस कर रही हैं ? How does the cat feel? (point to picture 3)	angry/bad/hurt/ disappointed	good/happy	*internal state*

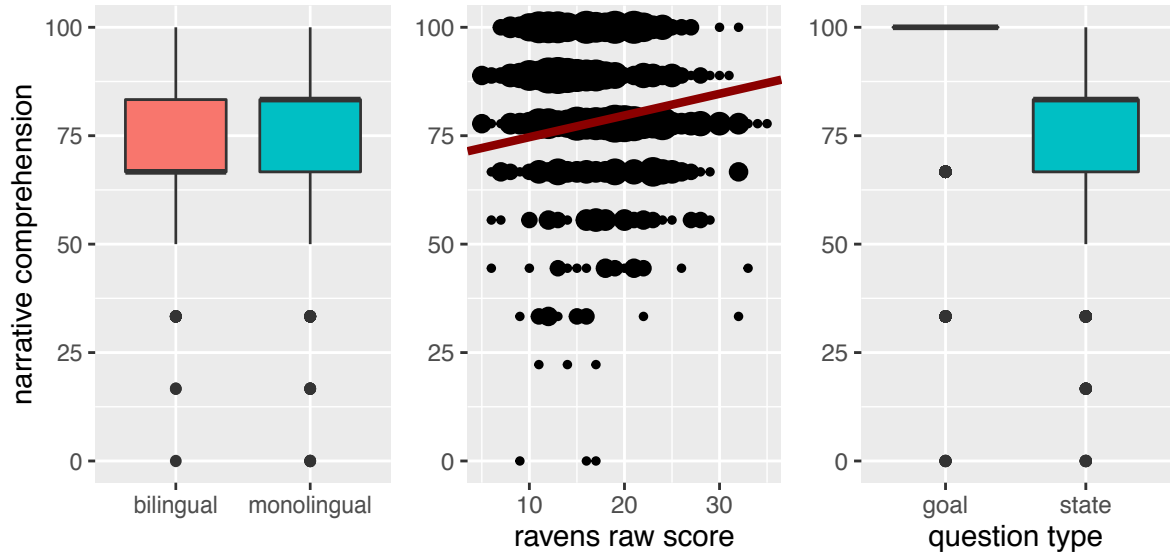

Figure 1. Relations between narrative comprehension score and bilingualism (left panel, non-significant), Raven's score (middle panel, significant), and question type (right panel, significant).

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