

# The narrative abilities of 4-year-old monolingual Afrikaans- and Xhosa-speaking children from low socio-economic status environments in South Africa

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Children's language, literacy, and narrative development are influenced by their home and social environments. Early language experiences are a key factor in the disparities in language development associated with low socio-economic status (SES). Narrative assessments offer clinicians valuable insights into a child's language and conceptual development, as well as their understanding of story structure. Including children from diverse socio-economic backgrounds in study samples helps researchers identify authentic peer groups and understand typical performance within subgroups of multilingual children. In this study, we examined the narratives of monolingual Afrikaans- ( $n=116$ ) and Xhosa-speaking ( $n=112$ ) children, aged 4-5 years, from low SES communities in South Africa. Narratives were collected using the Cat and Dog stories from the Multilingual Assessment Instrument for Narratives (MAIN) in the story generation mode. We first provide descriptive results on their performance in story structure and comprehension, focusing on the macrostructural complexity of their MAIN narratives. We then compare our results with previous MAIN studies that investigated the same age group and elicitation mode. Finally, we discuss the differences between our language groups, the insights gained from our findings and offer recommendations for future research.

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## 1 Introduction

Identifying the language difficulties of children from low socio-economic status (SES) communities during early preschool years is crucial. Early detection allows for timely and targeted interventions, potentially preventing a downward spiral of poor education, lack of academic progress and reduced life opportunities (Dore et al., 2023; Hjetland et al., 2020;

Hulme et al., 2024; Larson et al., 2020; Pace et al., 2017; Romeo et al., 2022). The assessment of narrative skills is one way to identify preschool children at risk for academic difficulties because the connection between early narrative competence and academic progress is well documented. Longitudinal studies have shown that preschool children's narrative production and comprehension skills significantly impact their early and later reading comprehension and achievement (Babayigit et al., 2021; Hjetland et al., 2020; Schick & Melzi, 2010). The reason for this is that reading comprehension depends on constructing mental representations of texts. Higher-order language skills, such as inference-making and reasoning, enable readers to connect different text elements and link these elements to their background knowledge (Kendeou et al., 2009; Oakhill & Cain, 2012). Similarly, narrative competence involves not only understanding or producing interconnected sentences or discourse but also reflects a child's ability to create meaningful representations of spoken or written discourse.

Well-developed narrative abilities enable children to use language to make sense of the world around them, understand temporal cues and cause-effect relations in connected discourse, and make inferences (Kendeou et al., 2009; Trabasso & Rodkin, 1994; Van den Broek et al., 1996; Westby, 2012). Psychological inferencing in the context of children's narratives refers to the process by which children make sense of the thoughts, feelings, and motivations of characters within a story. This involves using clues from the narrative to infer what characters might be thinking or feeling, and why they act in certain ways. The ability to understand and report story characters' goals and intentional behaviours reflect children's social cognition and grasp of psychological cause-effect relationships, reflecting their theory of mind abilities (Hedberg & Westby, 1993; Trabasso & Rodkin, 1994; Van den Broek et al., 1996). Fostering narrative competence in early preschool years is therefore essential for supporting children's overall language development, particularly for those from low SES communities who may be at risk for academic failure.

Narrative assessments are considered less biased and more ecologically valid for assessing children's language skills and can reveal communication strengths and weaknesses that may be overlooked by traditional, domain-specific, and standardised norm-referenced assessments (Gagarina et al., 2012; Goodrich et al., 2023). Furthermore, narrative assessment provides clinicians with insights into a child's language and conceptual development, as well as their understanding of the structural organisation of a story (Hedberg & Westby, 1993; Trabasso & Rodkin, 1994; Van den Broek et al., 1996; Westby 2012). This approach enables focused interventions to enhance, not only narrative skills but also verbal reasoning and inference-making, which are essential for academic success and reading comprehension development (Oakhill & Cain, 2012; Schick & Melzi, 2010; Westby, 2012).

In our study, we used the Multilingual Assessment Instrument for Narratives (MAIN; Gagarina et al., 2012, 2019) to assess the narratives of preschool children. This instrument was designed to assess narrative skills of children in multilingual and multicultural contexts. The developers aimed to create a culturally neutral instrument, suitable for evaluating children's narrative production and comprehension skills regardless of their linguistic, socio-economic and cultural backgrounds. The working hypothesis behind MAIN's development was that story structure is invariant across languages, with similar understanding of story events and causality

and similar awareness of the intentions and goal-directed behaviour of the protagonists (Gagarina et al., 2012, 2019). Currently, there are 92 language versions of MAIN available in over 60 countries, providing the scientific community with data on mono- and bilingual children from various cultures and language groups (Lindgren et al., 2023).

Lindgren et al. (2023) conducted a comprehensive review that reported age effects and developmental trends in story structure and comprehension skills from numerous MAIN studies. However, they noted that few researchers have considered socioeconomic status (SES) as a variable. To date, only one study by Wehmeier (2019) investigated the impact of SES and a child's home learning environment on their narrative development. This oversight may be because most MAIN studies were conducted in high-income countries in the Global North. For example, in Sweden, SES is rarely investigated in language studies because household income has a minimal impact on children's educational opportunities, and parental education levels are generally high (Bohnacker, 2016).

Lindgren et al. (2023) recommended that future research focus on the pooling of resources from researchers to establish at least referential norms for the acquisition of different narrative skills in mono-and multilingual children. Our interest in early identification of language difficulties lead us to examine the available data on story generation and story comprehension skills in monolingual children aged 4–5 years. We found only four MAIN studies that reported results for this age group using story generation to elicit narratives from monolingual children (Lindgren, 2019; 2022; Rodina, 2017; Wehmeier, 2019). There is therefore a lack of MAIN studies in low-SES populations and limited data about story generation skills in young monolingual children. The purpose of our study was to address this gap by investigating the story generation and comprehension skills of children aged 4–5 years from low SES communities.

### **1.1 Early narrative development**

The macrostructural complexity of children's narratives develops along an age-related continuum. Children exposed to stories in their home and school environments learn that these stories have plots in which characters engage in goal-directed behaviour, and they internalise these structural rules (Hedberg & Westby, 1993). Typical stories, according to Stein and Glenn's (1979) story-grammar model, includes an initiating event that prompts the main character to form a goal plan, an attempt to achieve the goal, and the outcome or consequence of the attempt. Between ages 3 and 7, they actively develop knowledge of story structure, both in terms of the components of a story and how these components link to together to form a coherent plot (Trabasso & Nickels, 1992; Trabasso et al., 1992).

Initially, from age 2, children's stories consist of isolated descriptions where they label objects and actions, followed by descriptive sequences where their descriptions cluster around a central idea. The next developmental stage shows their awareness of chronological order, allowing them to describe the actions of characters in temporally linked sequences (Applebee, 1978; Stein & Glenn, 1979; Peterson & McCabe, 1983).

As children become aware of physical cause-effect relationships between actions and story events, they produce stories where actions and outcomes are linked. They still tend to

focus on concrete observable actions and physical causality between actions. Their understanding of causality is conveyed by linking events and feelings as direct consequences of reactions to initiating events (Applebee, 1978; Hedberg & Westby, 1993; Kendeou et al., 2009). However, these story sequences do not yet express planning or goal-directed behaviour by characters.

A significant transition in narrative competence occurs around age 4 when children begin to convey their awareness of psychological causality and the intentions and goals of characters (Hedberg & Westby, 1993; Stein & Glenn, 1979; Trabasso et al., 1992). At this stage, they begin to encode character's actions in terms of their relevance to the goal plan, even though they may not yet make this explicit in their narration. Goal-based narratives typically emerge around ages 6 and 7, when children begin to understand psychological causality and become aware of characters' intentions and goals. Initially, they often do not include all the elements of a complete episode. A story may include a single goal statement, without describing attempts to achieve goal resulting in an incomplete episode. The goal statement may also be linked to either an attempt or a consequence statement, resulting in an abbreviated episode. By age 9, most children produce narratives that comprise of complete episodes and continue to develop their narrative abilities to later produce complex, interactive and embedded episodes (Hedberg & Westby, 1993; Peterson & McCabe, 1983; Stein & Glenn, 1979; Stein et al., 1997).

There is considerable variation in the reported ages at which monolingual children can produce goal-based narratives and the proportion of 4- to 5-year-old children that can produce complete episodes. This variation is due to differences in stimulus materials, elicitation methods and variations in the macrostructural models for analysis. Westby (2012) found that 16% of preschool children are already able to produce complete episodes. Using the telling mode in the *Frog-story*, Trabasso et al. (1992) found that 50% of 4–5-year-olds produced complete episodes. Khan et al. (2016) using a wordless picture book retelling task found that 45% of 4-year-olds, 66% of 5-year-olds could produce complete episodes.

With regard to studies using MAIN, a longitudinal study by Lindgren (2019) of monolingual Swedish children (N=17), using the story generation mode and the Baby Birds/Baby Goats stories found that 60.8% of the 4-year-old group and 27.5% of the 5-year-olds produced no sequences, in other words they did not combine any Goal (G), Attempt (A) or Outcome (O) elements in any of the three possible episodes. At age 4 years, 31% produced AO-sequences, and only 5.9% produced GAOs. By age 5, 60.8% produced AO-sequences, and 7.8% produced GAOs. Lindgren's (2019) analysis were based on all three episodes in all narratives and not the highest level reached at least once in the narratives. Rodina (2017) used the same elicitation method and stories, but reported the highest macrostructural level reached per narrative. In this study, monolingual Russian (N=16) and Norwegian (N=16) children aged 4 years, mostly produced AO-sequences as their highest level of complexity (Russian: 56%; Norwegian: 66%), and fewer GAOs (Russian: 24%; Norwegian: 20%).

The occurrence of complete episodes in MAIN narratives in this age group seems low in comparison with patterns observed by e.g., Trabasso et al. (1992) and Khan et al. (2016), but Lindgren (2018, p. 249) points out that the MAIN definition of a complete episode is stricter than the one employed in analyses based on Stein and Glenn's (1979) story grammar model. In

the Stein and Glenn model, a character's internal responses to a problem can serve as an indication of goal-directed behaviour, allowing narratives without explicit goal statements to be classified as complete episodes. In MAIN, the goal statement is specified as the first component in a full episode denoted as GAO and requires an explicit goal statement. From this perspective, a child's psychological awareness and ability to infer a character's goal plan are essential for understanding that actions are driven by goals and have effects and outcomes related to those goals (Kendeou et al., 2009; Stein et al., 1997; Trabasso & Rodkin, 1994; Westby, 2012).

## ***1.2 Environmental and socio-economic influences on narrative development***

Children's language, literacy and narrative development are directly influenced by their home and social environment. Differences in early language experiences are a primary cause of SES-related disparities in children's language development. Children from low SES backgrounds often have significantly lower vocabularies (Hart & Risley, 1995; Hoff, 2003), less developed language skills (Golinkoff et al., 2019; Fernald et al., 2011; Hoff, 2013; Pace et al., 2017) and lower executive functioning skills (Burris & Brown, 2014; Romeo et al., 2023) compared to their peers from more advantaged backgrounds. Consequently, they enter school with a significant disadvantage in terms of language development and cognitive skills. This initial gap can have long-term implications as early language abilities are predictive of later academic progress, particularly in reading comprehension (Fernald et al., 2011; Hulme et al., 2024).

SES is a multidimensional construct that refers to a family's economic and social status, typically based on measures of household income, and parental education and occupation. Pace et al., (2017) identified three main pathways through which SES can impact language development during childhood: individual child characteristics, the quality and quantity of input in parent-child interactions, and the availability of age-appropriate materials at home and enriching experiences beyond the home environment. In high-income countries, levels of parental education are generally high, the quality of childcare and education is not directly linked to family income and all children have equal access to education (Dore et al., 2023; Raikes et al., 2023). In contrast, in lower- and middle-income countries, children's educational opportunities and access to early childhood programmes depend on family income and their socio-economic environment, with many parents having lower levels of formal education (Dore et al., 2023; Fernald et al., 2011; Hall et al., 2024; Raikes et al., 2023). In South Africa, a middle-income country in the Global South, children from low-SES communities often face extreme poverty, food insecurity and health-related problems due to poor living conditions and inadequate access to health care. They often have limited educational resources at home and are less likely to have access to formal early childhood learning programmes (Giese et al., 2022; Hall et al., 2024; Moses & Van den Berg, 2023). These challenges can negatively affect their overall development, including cognitive and language skills, as well as their mental well-being.

The quantity and quality of child-directed speech in households are linked to maternal education levels (Babayigit et al., 2021; Fernald et al., 2011; Golinkoff et al., 2019; Hoff, 2013) and maternal stress due to economic hardship (Dore et al., 2023). Parents living in poverty often

work long hours, which reduces the time they can spend engaging in quality language and learning activities with their children. Environmental disadvantages linked to low SES include limited access to learning materials and literacy resources, which negatively impact the development of receptive vocabulary, oral language skills, and early print awareness skills. In contrast, high-SES households are more likely to provide children with developmentally appropriate resources such as books, toys and enriching experiences beyond the home (Dawes, et al., 2020; Golinkoff et al., 2019; Hoff, 2003; Moses & Van den Berg, 2023).

It should be kept in mind that SES and cultural aspects are often conflated in studies on culturally and linguistically diverse children's narrative and literacy development, and this can obscure the distinct contributions of each factor (Hoff, 2013). In many countries, non-mainstream cultural communities are also more likely to experience poverty and economic hardship (Schick & Melzi, 2010). As a result, research may attribute differences in language and literacy skills to SES when they are, in fact, influenced by cultural practices intertwined with SES.

Only one MAIN study, by Wehmeier (2019), investigated the development of narrative macrostructure and the links between narrative skills and aspects of socio-economic status and home learning environment (HLE). This study of 198 monolingual German children aged 4;6 to 5;11, investigated correlations between MAIN results and aspects of the children's HLE, parental education and household income. The HLE measures included the frequency of book exposure and shared reading experiences, the duration of daily exposure to books and the total number of books at home. Wehmeier found that the impact of SES and HLE measures on narrative macrostructure was small or non-existent. However, this study reflected the effect of SES indicators of a high-income country, and the findings cannot be generalised to contexts in the Global South where many children grow up in conditions of extreme poverty that has a direct and pervasive impact on their home language and learning environment and educational opportunities.

### **1.3 The present study**

Our study examined the narrative performances of monolingual Xhosa-speaking ( $n=112$ ) and Afrikaans-speaking ( $n=116$ ) children,<sup>1</sup> aged 4-5 years, from low-SES communities in South Africa.<sup>2</sup> We elicited MAIN narratives from the children using the story generation mode with the Cat and Dog stories.

We were particularly interested in the patterns of macrostructural complexity in our populations. From a clinical and remedial perspective, the main purpose of assessment is to gain insight into participants' abilities and provide information that can guide focused interventions. Qualitative analyses of macrostructural patterns can reveal the nature and extent

<sup>1</sup> Afrikaans and Xhosa are two of South Africa's 12 official languages, with respectively 7.2 million and 8 million native speakers. Xhosa is a Southern Bantu language with a very rich system of agglutinating morphology. Afrikaans is a West Germanic language that evolved from 17th-century Dutch. Both languages use the Latin alphabet.

<sup>2</sup> The data was part of the pre-intervention assessment battery for a study evaluating the efficacy of a story-based programme aimed at improving early language and literacy skills in preschool children from low-SES backgrounds and under-resourced environments. For more details on this project, see Cain et al. (2024).

of children's higher-order language skills, such as inference-making and understanding of physical and psychological cause-effect relationships. This enables the design of targeted interventions to enhance these skills, ultimately supporting children's overall language, cognitive, and social development. Additionally, we aimed to contribute to the limited existing information on MAIN performances in this age group and socioeconomic status (SES).

This paper addresses the following research questions:

- i. How do 4–5-year-old monolingual Afrikaans- and Xhosa-speaking children from low-SES communities perform on the MAIN in terms of story structure, comprehension, use of internal state terms, and macrostructural complexity?
- ii. How do the narrative performances of the study participants compare to those reported in previous studies on children of a similar age group?
- iii. Are there significant differences in the MAIN results between the two language groups?
- iv. Do the Cat and Dog stories elicit different performances in terms of story structure, comprehension and the use of internal state terms?

## **2 Method**

### **2.1 Ethical considerations**

The study was approved by the Ethics Committee of Health Sciences, Stellenbosch University, (N21/05/047). Written informed consent was obtained from the parents, and verbal assent was given by each child participant before the study began.

### **2.2 Participants**

In South Africa, preschool attendance only becomes compulsory at age 6, starting with a preparatory Grade R year before formal education begins in Grade 1. Children younger than 6 years from low-SES communities mostly attend Early Childhood Development (ECD) centres run by non-governmental organisations or non-profit community programmes, or they do not attend any form of preschool programme at all. ECD centres receive small state subsidies per child if the child's household income is below a predetermined level. To determine the participants' SES, we used the monthly fee charged at the ECD centre and whether the centre receives a state subsidy per child. Our participants were recruited from centres with similar lower-range fee structures, where at least 50% of the children receive state subsidies.

We selected ECD centres where the language of learning and teaching was either Afrikaans or Xhosa. The 27 Afrikaans-language centres were in Paarl-East and Wellington in the Cape Winelands district and the 28 Xhosa-language centres were in Khayelitsha, a township in the Cape Town metropole. Five children, per classroom were randomly selected from each centre to participate. The final study sample comprised of monolingual Afrikaans-speaking children ( $N = 116$ , mean age: 4;6 years, SD: 0;3) and Xhosa- speaking children ( $N = 112$ , mean age: 4;5 years, SD: 0;3).

### 2.2.1 Home Learning Environment

The ELOM Home Learning Environment Questionnaire (Dawes et al., 2023) was used to provide information about participants' home learning environment and education levels of the main caregiver. In some of the households the children did not live with their parents and the main caregiver was a grandparent or a family member. The questionnaire was completed through telephonic interviews with children's main caregivers in their home languages.

This tool includes three categories of home learning environment (HLE) indicators:

- i. Early learning resources: The availability of books, games, and activities at home.
- ii. Home learning activities: Activities that promote learning and literacy, such as telling stories and reading books.
- iii. Caregiver time for learning and literacy activities with the child: The amount of time caregivers spends with their children during the week and weekends.

The HLE questionnaire was conducted with 42% of the Afrikaans-speaking caregivers. Their average age was 33 years, and 68% reported completing secondary school as their highest educational level. No caregiver had tertiary education qualifications. Caregivers reported an average of five picture books in their homes (range = 0–30) and 14% said that they had no children's books in their home, 60% had between one and five books, and 26% said that they had more than five books. Regarding time spent on home learning activities, 4% reported that they spend no time with their children, 18% never read books to them, and 18% never tell stories.

The HLE questionnaire was conducted with 46% of the Xhosa-speaking caregivers. Their average age was 44 years, and 53% reported completing secondary school as their highest educational level. None of the caregivers had tertiary education qualifications. On average, caregivers reported having one picture book in their homes (range = 0–4). Additionally, 47% of caregivers said they had no children's books at home, while 53% had between one and four. Regarding time spent on home learning activities, 66% reported that they spend no time with their children, 66% never read books to them, and 62% never tell stories.

### 2.3 Narrative assessment procedure

Participant narratives were elicited by assessors that were trained by the authors in the use of MAIN during a one-day workshop prior to the assessments. The workshop included theoretical orientation about MAIN, demonstrations, role-playing, and problem-solving exercises, with opportunities to ask questions. The assessors were all native speakers of Xhosa and Afrikaans and conducted the assessments in the participants' first languages.

Assessments took place in quiet rooms at the ECD centres. All narratives were audio-recorded using Samsung Galaxy Tab A7 Lite 8.7 tablets. To enhance the clarity of recordings and transcription accuracy, Logitech H111 headsets with microphones were used. The microphones, positioned near the mouth, were loosely fitted around the children's necks. After each testing day, the recordings were uploaded to an encrypted OneDrive folder for backup and

analysis. This process allowed us to monitor the data collection process and ensure adherence to testing protocols.

The Cat and Dog stories were used in the story generation mode following the standardized MAIN procedure (Gagarina et al., 2019). Half of the children were tested with the Cat story, and the other half with the Dog story. Assessments began with a warm-up question. The picture sequence was presented to the child without the examiner seeing it in the prescribed fold-out manner to mitigate joint attention and shared knowledge effects. Participants first viewed all six pictures to familiarise themselves with the story, then narrated it two pictures at a time. After storytelling, the 10 comprehension questions were asked. Each assessment followed the same procedure and lasted about 15 minutes.

#### **2.4 Data transcription, coding and analysis**

All narratives were transcribed and analysed for story structure components (SS), internal state terms (ISTs), and structural complexity (SC) following the MAIN protocol and guidelines (Gagarina et al., 2012; 2019). The SS components (setting, IST as initiating event (IE), goal, attempt, outcome, IST as reaction (R)) were coded for each of the three episodes in the story. Each participant's total score, out of a maximum of 17, was recorded on the test form. For ISTs, all perceptual state terms (e.g., *see, hear*), physiological state terms (e.g., *hungry, hurt*), consciousness terms (e.g., *alive, awake*), emotion terms (e.g., *hungry, angry*), mental verbs (e.g., *want, decide*), and linguistic verbs (e.g., *say, call*) in their narratives were recorded.

To analyse SC, we used the MAIN scoring protocol (Gagarina et al., 2019) and the Westby (2012) binary decision tree to classify each of the three episodes in the narratives into one of five levels of macrostructural complexity, ranging from least to most complex:

No sequence: Contains none of the SS components, or only IE and/or R, or either an attempt (A) or outcome (O), but not both A and O (and no goal).

- i. AO: Includes both A and O components in an episode, but no goal (G) (Reaction sequence).
- ii. G: An isolated G statement (Abbreviated episode).
- iii. GA or GO: G is linked to either A or O in an episode, but not both (Incomplete episode).
- iv. GAO: G is linked to both A and O in an episode (Complete episode).
- v. The SC for each participant was recorded as the highest level of macrostructural complexity reached across the three episodes.

Following the guidelines by Hedberg and Westby (1993), Hughes et al. (1997) and the Westby (2012) binary decision tree, we also analysed the narratives in the 'no sequence' category qualitatively to provide more information about the developmental patterns and differences between the language groups. We coded narratives that contained labels and isolated descriptions (e.g., *a cat, the boy has a stick, fish in the bucket*) or a series of descriptions that are related but without chronological order or causal relationships (e.g., *the dog jumps, he is big, he is brown*) as descriptive sequences. Narratives that contained actions that were

chronologically ordered but not causally linked, were classified as action sequences (e.g., *the cat jumps, then the butterfly flies, and then the boy walks by the river, then his ball fell in*).

The MAIN comprehension section comprises 10 open-ended questions that assess understanding of the goals and ISTs in the stories. Additionally, one question assesses understanding of the overall story meaning and theory of mind. Each correct answer is awarded one point, with a total possible comprehension score of 10. Each participant's comprehension score was recorded as the total number of correct responses out of a maximum of 10 for the comprehension questions.

The first author, a native speaker of Afrikaans and experienced in the use of MAIN, transcribed and analysed all the Afrikaans narratives from the recordings. The second author re-transcribed 12 randomly selected samples (10%) of the data and word-level agreement was 99%, suggesting a high level of reliability. All samples (100%) were independently analysed by the second author and interrater agreement for story structure score was 88%, for narrative comprehension 98%, for ISTs 96%, and for structural complexity 91% agreement. Disagreements were resolved through consultation.

A research assistant fluent in Xhosa transcribed the narratives from the recordings. All the transcriptions and coding decisions were then verified by a second research assistant, a native speaker of Xhosa who is familiar with different dialects spoken in rural areas. Disagreements were resolved by consulting with a third native speaker of Xhosa until all disagreements were resolved.

Statistical analysis was conducted using *lme4*-package in R. Statistical significance was determined using a 5% significance level ( $p < .05$ ) as the guideline. A Type III ANOVA was used to evaluate the significance of differences between factors and their interactions, while Cohen's d was calculated to measure effect sizes.

### 3 Results

In this section we first present descriptive statistics and comparisons between the Afrikaans- and Xhosa- speaking groups regarding story structure, comprehension, inclusion of internal state terms, and macrostructural complexity. We also examine the effects and interactions between language groups and stories for these variables to determine if there were significant differences between the groups and if the story influenced the narrative performance. Finally, we compare our findings with other studies that used the story generation mode to assess MAIN performances in monolingual children aged 4–5 years.

#### 3.1 Story structure

The story structure (SS) scores for the two language groups are shown in Table 1. The scores, out of a maximum of 17, were generally low and 16% of the Afrikaans group and 29% of Xhosa group scored 0 out of 17.

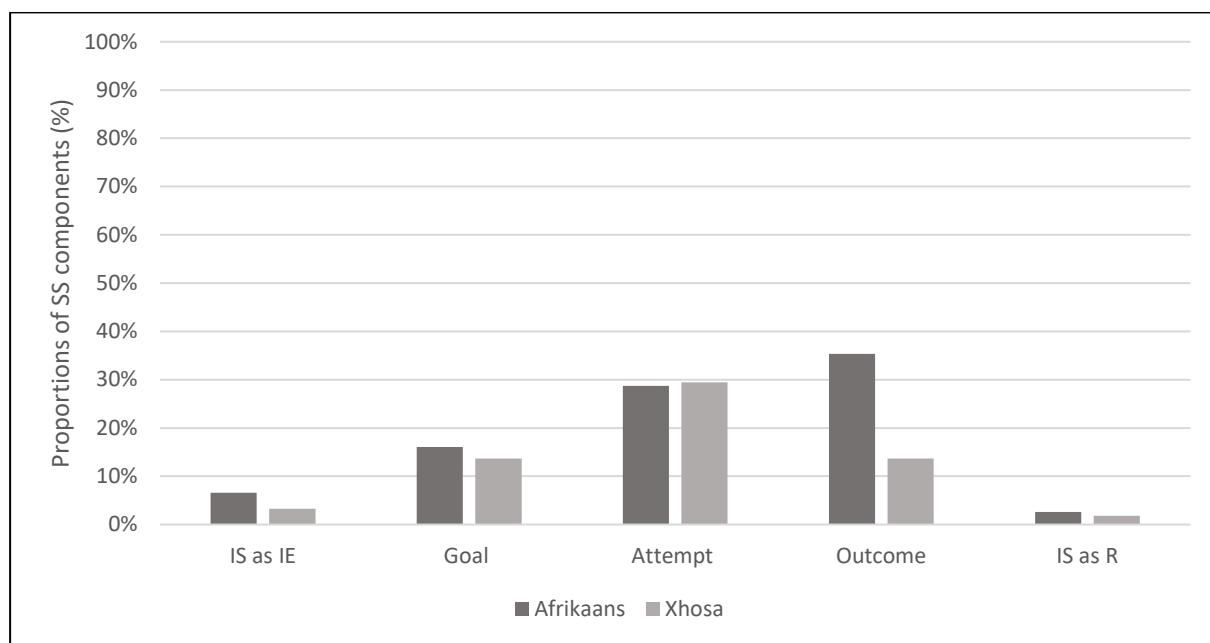
**Table 1.** Descriptive statistics for the story structure score (mean, SD, range) by language group

Group	M	SD	Range
Afrikaans	2.7	2.0	0 – 8
Xhosa	1.9	1.7	0 – 7

A 2 x 2 (language group x story) Type III ANOVA showed that language group significantly affected the SS scores,  $F(1, 224) = 12.06, p < .01$ , with the Afrikaans group scoring higher than the Xhosa group. However, there was no significant main effect of story,  $F(1, 224) = 0.21, p = .65$ , nor a significant interaction between language and story,  $F(1, 224) = 0.10, p = .75$ . A post hoc analysis showed a medium effect size for the difference between the two language groups (Cohen's  $d = 0.7$ ).

### 3.2 Macrostructural components

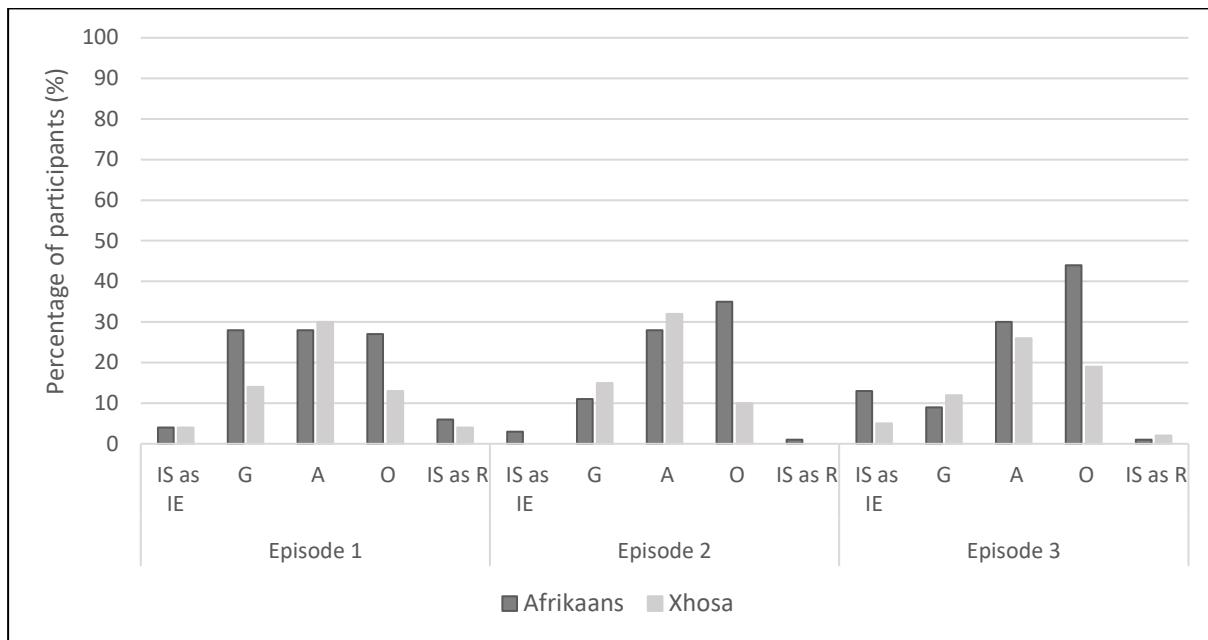
To explore the significant differences in SS scores between the Afrikaans and Xhosa groups we examined the distribution of macrostructural components in their narratives. The proportion of each type of macrostructural component, excluding the Setting, in all three episodes in the participant narratives is shown in Figure 1.



**Figure 1:** Distribution of story structure components in all episodes by language group.

Each participant had three opportunities to produce each SS component, which means the reported proportions are cumulative accounts for the total number of components across all episodes. Similar patterns were observed in the distribution of SS components in both groups, except for Outcomes (Afrikaans: 35%, Xhosa: 14%) and Internal States as Initiating Events (Afrikaans: 7%, Xhosa: 3%).

To further explore these patterns, we analysed the distribution of SS components per episode, as shown in Figure 2.



**Figure 2:** Distribution of story structure components in each episode by language group

The Attempts across episodes were similar, but the Afrikaans group included considerably more Outcomes across all episodes. It appears that the Xhosa-speaking participants who included Attempts in the three episodes, did not link these with the Outcomes of the actions. The Afrikaans group (28%) also included twice as many Goals than the Xhosa group (14%) in Episode 1, but a similar proportion of Goals in episode 2 (Afrikaans: 11%, Xhosa: 15%) and episode 3 (Afrikaans: 9%, Xhosa: 12%). Less than 6% of participants included IS as IE or Reaction across episodes, except for episode 3 where 13% of the Afrikaans group included the IS as IE. In sum, the significant difference in SS scores between the two groups can be attributed to the Afrikaans group's overall higher inclusion of Outcomes.

### 3.3 Internal state terms

All occurrences of ISTs, including repeated ones, were counted in the narratives. Table 2 presents the mean (M), standard deviation (SD), and range for the number of ISTs included in the Afrikaans and Xhosa narratives.

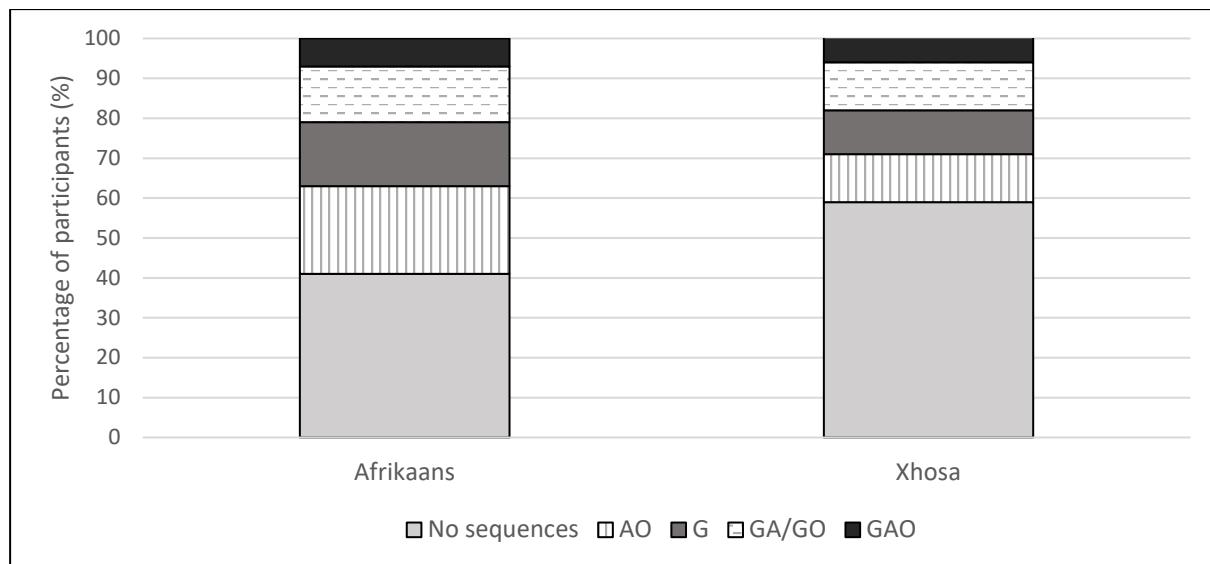
**Table 2.** Descriptive statistics for the number of ISTs (mean, SD, range) by language group

Group	M	SD	Range
Afrikaans	1.3	1.4	0 – 7
Xhosa	1.1	1.8	0 – 10

The occurrence of ISTs was low and 41% of Afrikaans and 56% Xhosa narratives contained no ISTs. A language group x story (2x2) Type III ANOVA revealed no significant main effects for language group,  $F(1, 224) = 0.70, p = .40$ , or story,  $F(1, 224) = .27, p = .60$ . Additionally, the interaction between language group and story was not significant,  $F(1, 224) = 0.08, p = .78$ .

### **3.4 Macrostructural Complexity**

The SC for each participant was recorded as the highest level of macrostructural complexity that they reached in any of the episodes, in other words, at least once in their narratives. The results of the proportion of SC levels attained by participants are displayed by language group in figure 3.



**Figure 3:** Proportion of the participants who reached the different macrostructural complexity levels, by language group

Most of the narratives of both groups consisted of ‘no sequences’ (Afrikaans: 41%, Xhosa: 59%). The same proportion of children in both groups (7%) produced at least one complete episode (GAO-sequence) per narrative. Similar patterns for G only (Afrikaans: 16%, Xhosa: 11%) and GA/GO (Afrikaans: 14%, Xhosa: 12%) were also observed. A notable difference was that for 22% of the Afrikaans compared to 12% of the Xhosa group, the AO-sequence (reaction sequence) was the highest SC level attained.

Our qualitative analyses of the narratives classified as ‘no sequence’, using the Westby (2012) decision tree classification and guidelines in Hedberg and Westby (1993), found that 19% of Afrikaans and 24% of the Xhosa narratives were at the descriptive level. The remaining ‘no sequence’ narratives, (Afrikaans: 22% and Xhosa: 35%) were at the action sequence level. These participants described actions in the stories in chronological order, but did not establish causal links between the actions or other story components.

### **3.5 Story Comprehension**

Participants’ story comprehension (SC) scores are shown in Table 3. The scores, out of a maximum of 10, were generally low and 2% of the Afrikaans group and 8% of Xhosa group had no correct answers.

**Table 3.** Descriptive statistics for story comprehension (mean, SD, range) by language group

Group	M	SD	Range
Afrikaans	4.5	2.4	0 – 10
Xhosa	2.9	1.9	0 – 9

A language group x story (2x2) Type III ANOVA revealed a significant main effect for language group,  $F(1, 224) = 27.32, p < .01$ , indicating that the groups differed significantly with regard to story comprehension with higher scores in the Afrikaans group. Post hoc analyses indicated a medium effect size (Cohen's  $d = 0.7$ ). There was no significant interaction between group and story,  $F(1, 224) = 0.11, p = .74$ .

### 3.6 Comparisons with previous studies

In this section, we compare our findings with results from other MAIN studies involving monolingual children aged 4–5, using the Baby Birds/Baby Goats or Cat/Dog stories in the story generation (telling) mode.<sup>3</sup> Descriptive data for story structure and comprehension scores from the four studies that met our criteria are presented in Table 4. Similar trends can be observed, such as higher scores for comprehension than story structure. A notable exception is Wehmeier (2019), which reported lower scores for comprehension than production.

**Table 4.** Comparisons of MAIN story structure and comprehension scores in monolingual 4–5-year-old children, using story generation

Study	Participants (language, age)	Story	Story structure score / 17	Story comprehension score / 10
Rodina (2017) <sup>4</sup>	Russian (n=16) mean age 4;5 (SD 0;4)	Baby Birds/Baby Goats for story structure, Cat/Dog for comprehension	M=7.2 (SD 1.9) range 4 – 12	M=7.5 (SD 1.8) range 3 – 10
	Norwegian (n=16) mean age 4;5 (SD 0;5)	Baby Birds/Baby Goats for story structure, Cat/Dog for comprehension	M=6.8 (SD 1.7) range 4 – 10	M= 7.9 (SD 1.9) range 3-10
Lindgren (2019)	Swedish (n=17) mean age 4;4 (SD 0;3)	Baby Birds/Baby Goats	M=5.2 (SD 2.3) range 2 – 10	M= 5.3 (SD 2.5) range 1 – 9
Lindgren (2022) <sup>5</sup>	Swedish (n=17) mean age 4;4 (SD 0;3)	Cat/Dog	M=4.7 (SD 1.2) range 3 – 7	M=7.1 (SD 2.7) range 2 – 10
Wehmeier (2019)	German (n=56) mean age 4;7 (SD 1;6)	Baby Birds	M=6.3 (SD 2.1)	M=3.8 (SD 1.6)

<sup>3</sup> Only studies using the telling mode were included as significant differences have been found for story structure and story comprehension scores between telling, retelling and model story modes of elicitation (see Otwinowska et al., 2020; Roch et al., 2016; Wehmeier, 2019).

<sup>4</sup> In this study, comprehension questions immediately preceded production and may have had a priming effect on story structure.

<sup>5</sup> The participants in Lindgren (2022) were the same as in Lindgren (2019).

The present study	Afrikaans (n=116)	Cat/Dog	M=2.7 (SD 2.0) range 0 – 8	M=4.5 (SD = 2.4) range 0 – 10
	Xhosa (n=112)	Cat/Dog	M=1.9 (SD 1.7) range 0 – 7	M=2.9 (SD = 1.9) range 0 – 9

As shown in Table 4, our participants' average SS and comprehension scores were considerably lower, with a smaller range of scores, compared to participants in other studies. No participant in the studies by Lindgren (2019; 2022) or Rodina (2017) had zero scores for story structure and comprehension (Wehmeier did not report ranges). None of the studies included ISTs and thus no comparisons could be made for this measure. Due to methodological differences in scoring and reporting, we could also not make direct comparisons with the other studies regarding episodic complexity.

#### 4 Discussion

The present study examined the narratives of monolingual Afrikaans- (n=116) and Xhosa-speaking (n=112) children, aged 4-5 years, from low SES communities in South Africa. The narratives were collected using the Cat and Dog stories from the Multilingual Assessment Instrument for Narratives (MAIN; Gagarina et al., 2012; 2019) in the story generation mode. Our participants were randomly selected from ECD centres with similar low-range fees that receive child subsidies based on household income; a proxy used to determine child SES in South Africa. Our aim was to contribute to the existing data on narrative abilities in this age group, focusing on story structure, comprehension, the use of internal state terms, and macrostructural complexity. This study is the first to use MAIN to examine the narratives of children from low socio-economic communities in the Global South.

First, we provide an overview of our results and compare them with the findings of previous MAIN story generation studies on children of a similar age group (Lindgren, 2019; 2022; Rodina, 2017; Wehmeier, 2019). The average story structure and comprehension scores of our participants were considerably lower compared to those of other language groups of the same age. The range of scores was also smaller, indicating less variability in the performances within our groups. In contrast to previous studies, some participants in both language groups had zero scores for story structure and comprehension. We found no differences between the Cat and Dog stories regarding story structure, the use of internal state terms, or story comprehension.

Regarding the types of story structure elements, our participants included more Attempt and Outcome statements than Settings, Goals and ISTs over all three episodes. This pattern was also observed in other studies (see Lindgren et al., 2023). One explanation is that Goals and ISTs are less overtly portrayed in the pictures and require more inferencing from the child, while Attempts and Outcomes are linked to observable actions happening in the story, and therefore more evident in the pictures (Lindgren et al., 2023). However, previous studies have shown that children in this age group mainly focus on concrete observable actions and physical causality between actions and are less aware of psychological causality and characters'

intentions and goals. They seldom describe the thoughts, feelings, and perceptions of characters within a story and that the understanding of and mastery of internal state terms only occur later (Trabasso & Rodkin, 1994; Van den Broek et al., 1996; Westby 2012). This is confirmed by our analyses of all the ISTs included in the narratives, showing that 41% of Afrikaans and 56% of Xhosa narratives contained no ISTs.

The story complexity level for each participant was analysed as the highest level of macrostructural complexity that they reached in any of the episodes, in other words, at least once in their narratives. Most narratives were classified as ‘no sequences’, in other words, their narratives contained no story structure components, or ISTs as IE and/or R, or isolated Attempts or Outcomes. Unlike Lindgren (2019) we did not include narratives with a single G in the ‘no sequence’ category. We believe that the creation of a goal statement, even if it is not connected to other story elements, indicates that a child can infer a character’s intentions and goal-directed behaviour. Instead, we classified single Goals as abbreviated episodes, following the guidelines of Gagarina et al. (2012; 2019). From a macrostructural development perspective, these abbreviated episodes are considered more advanced than the ‘no sequence’ or AO levels. Our interest was in determining how many participants reached this level of macrostructural complexity. We found that similar proportions of our participants produced single G (Afrikaans: 16%, Xhosa: 11%) and GA/GO (Afrikaans: 14%, Xhosa: 12%). An interesting finding was that for 22% of the Afrikaans group, the AO-sequence was their highest macrostructural level, compared to 12% of the Xhosa group. The Attempts across episodes were similar for the two groups, but the Afrikaans-speaking participants included considerably more Outcomes across all episodes. It therefore appears that fewer Xhosa-speaking participants were able to infer causal links between Attempt and Outcomes.

Our qualitative analyses of the narratives in the ‘no sequence’ category, using the Westby (2012) decision tree classification, revealed that 19% of Afrikaans and 24% of Xhosa narratives were at the descriptive level. This indicates that the children did not make any inferences about the pictures or the storyline. Instead, they provided words or phrases to label and describe characters, actions, and objects, or offered a series of descriptions in no chronological order. This finding raises clinical concern, as the lack of inferences in their narratives may reflect difficulties in higher-level cognitive and linguistic processing required for cohesive storytelling.

Finally, we considered the differences between the Afrikaans and Xhosa groups. All participants were randomly recruited from similar ECD centres and according to the same SES indicators. We expected similar results in both groups because of the invariance of MAIN across languages that allows assessment of narrative skills in children from diverse linguistic backgrounds in a comparable way. The significantly higher scores of the Afrikaans-speaking group for story structure and comprehension were therefore unexpected. A possible explanation for the lower performances in the Xhosa-speaking participants could be differences in the home learning environment. The HLE questionnaires indicated that their main caregivers had lower education levels and spend less time with their children on learning and literacy activities. There were also fewer books in their homes and 47% of the respondents reported that there are no

books in their homes. We will explore correlations between HLE indicators and narrative performances in more depth in subsequent publications.

The influence of environmental and socio-economic influences on language and narrative development is well documented. Most of our participants came from impoverished communities. Our background information revealed a lack of books in their homes and that many caregivers seldom engage in activities that promote language and literacy with their children. Our participants had lower story structure and comprehension scores compared to participants in high-income countries in the Global North. Many of their narratives comprised of very basic descriptions without any inferences about the story content. Our findings also indicate that the significant performance differences between Afrikaans-speaking and Xhosa-speaking participants may be attributed to variations in the home learning environment. We therefore conclude that home learning environment and low SES factors affected our participants' narrative competence substantially, highlighting the urgent need for early identification of and targeted interventions to support language development in disadvantaged communities.

Our study would have been enhanced by also including Afrikaans and Xhosa-speaking participants from higher SES environments. This would help to further disentangle the roles of SES and home learning environment on narrative abilities. Previous studies have shown that narrative ability levels improve substantially between the ages of 3 and 7 years (Khan et al., 2016; Lindgren, 2019, 2022; Trabasso et al., 1992). A longitudinal study design, following our participants over time, would also have provided deeper insights into their narrative abilities and developmental patterns. We recommend that more MAIN studies include low SES participants to provide information about the impact of SES and home learning environmental factors on narrative competence and development.

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*The narrative abilities of 4-year-old monolingual Afrikaans- and Xhosa-speaking children from low socio-economic status environments in South Africa*

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