Narrative macrostructure of Croatian 5–7-year-old preschoolers: the effects of receptive vocabulary, sentence comprehension and age

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Narrative skills start to develop during the preschool years. Significant growth in story structure and complexity is expected in older preschoolers, especially in the years just before they start school. This study aims to examine narrative macrostructure of Croatian preschoolers and the association between their core language skills and age on one side and narrative production abilities on the other side during the final preschool year (~ age of 6), when language and narrative skills develop rapidly. Receptive language skills were measured using standardized tests adapted for Croatian (PPVT-III-HR, TROG-2: HR) while narrative production was assessed through two macrostructure measures: story structure and episodic complexity (Croatian MAIN). The results show that the children primarily focus on objective events, such as attempts and outcomes, in their storytelling. They less frequently include goals, character intentions, perspectives, or internal states, showing a continued asymmetry between describing events and explaining causes and effects, especially those connected to the internal states of characters. Regarding episodic complexity, the children's narratives rarely contain complete episodic structures. The results also showed that receptive vocabulary, sentence comprehension, and age did not predict story structure. Other factors (such as task type, language, culture, the educational context, or expressive language skills) may have a greater effect on narrative production than these factors. The results highlight the need to research different contexts and

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conduct longitudinal and cross-linguistic studies to determine what is universal in narrative development and what may be attributed to other factors.

1 Introduction

In the early years of life, children's language development evolves from producing their first words to the ability to create meaningful discourse. One type of discourse particularly important in children's language development is narrative (storytelling). Narrative abilities are valuable for several reasons. First, narratives serve as an effective tool in fostering oral language development. Unlike everyday conversation, storytelling requires more complex language structures, including explicit vocabulary, clear use of pronouns, temporal and causal connectives, and organizing information in logical sequence. Through narratives, children gain opportunities to practice many advanced language abilities even before they start to read (Stadler & Ward, 2005). Moreover, narratives are considered a bridge to literacy. A large body of research has shown that oral narrative abilities in the preschool years are closely linked to emergent literacy or early reading abilities (Piasta et al., 2018), and later reading comprehension and writing skills (Griffin et al., 2004) in that way playing a significant role in later academic success (Boudreau, 2008; O'Neill et al., 2004).

Considering how early narrative abilities have been found to predict later language and academic outcomes, it is crucial to understand how these abilities develop throughout childhood and how they can accordingly be supported. The significance of narratives has been widely recognized, with many researchers investigating the progression of children's narrative abilities from early childhood through preschool and into years of formal school education, identifying key age-related milestones in narrative development. Throughout this period, considerable individual differences emerge among children's narrative abilities. These individual differences are shaped by numerous factors, including core lexical skills (e.g., Blom & Boerma, 2016; Khan et al., 2021; Tilstra & McMaster, 2007; Uccelli & Páez, 2007), cognitive development (e.g., Blom & Boerma, 2016; Duinmeijer et al., 2012), education, parental and peer interactions (e.g., Haden et al., 1997; Peterson & McCabe, 1994; Reese & Newcombe, 2007), cultural background (e.g., Melzi, 2000; Wang & Leichtman, 2000), socioeconomic status (e.g., Alt et al., 2016; Mozzanica et al., 2017), individual temperament and personality (e.g., Kucker et al., 2021). Age is often highlighted as one of the most important factors that predicts narrative abilities (e.g., Khan et al., 2016; Lindgren, 2019). Many studies have examined narrative abilities in children aged 4 to 7. However, less is known about developmental changes within narrower age ranges, particularly around the age of six. This developmental period around the age of 6 is marked by significant growth in narrative skills, highlighting the importance of exploring the interaction between age and language development. This study focuses on Croatian speaking children in their final preschool year to address this area.

1.1 Development of narrative abilities

The development of children's narrative abilities unfolds in several stages, typically spanning from early childhood to the beginning of the school years, but also during school years, adolescence and adulthood. Throughout preschool period, children make progress in multiple aspects of narrative abilities including the capacity to express the structural organization of the narrative, referred to as macrostructure and the use of specific linguistic elements, or microstructure (e.g., Berman & Slobin, 1994, Khan et al., 2016).

Numerous studies indicate that macrostructure develops extensively from age 3 to 7 (Berman & Slobin, 1994; Bohnacker, 2016; Lindgren, 2019). For instance, children's narratives between the ages of 2 and 3 usually involve just naming objects and people without forming connections between them but already by ages 3 to 4, although their stories often remain centered around a single topic without temporal or causal relationships, children begin to expand their narratives by listing perceptual attributes or character actions (Stadler & Ward, 2005). At the macrostructural level, one way to observe clear developmental progression in children's narrative abilities between the ages of 3–7, in both monolinguals and bilinguals, is through the measurement of story structure (Berman & Slobin, 1994; Bohnacker, 2016; Castilla-Earls et al., 2015; Khan et al., 2016; Lindgren, 2019; 2023). Story structure refers to the organization of a narrative into its essential components, such as the setting, characters, initiating events, goals, attempts, and outcomes. For example, findings from Khan et al. (2016) demonstrate age-related progress, with 5- and 6-year-old English-speaking children showing significantly stronger story-structure forming abilities compared to 3- and 4-year-olds. Similarly, Lindgren (2018) found that Swedish monolinguals and bilinguals at age 6 outperformed 5-year-olds, who, in turn, achieved higher scores than 4-year-olds on the same measures, including vocabulary, character introduction, and narrative macrostructure. Bohnacker (2016) reported that Swedish-English bilinguals aged 6 to 7 performed better than those aged 5, regardless of language, and similarly, Kunnari et al. (2016) found significant age-related improvements in story structure among Finnish monolinguals and Finnish–Swedish bilinguals aged 5 to 6;7. On the contrary, Lindgren's longitudinal (2019) study showed a large improvement in story structure from age 4;4 to 5;10, but no significant development from age 5–6 to 6–7, aligning with findings from a longitudinal study by Blom and Boerma (2016). This pattern suggests that narrative structure may undergo the most rapid development up to age 6, after which its progress stabilizes. As Stadler and Ward (2005) note, around age 6, children begin to produce narratives that contain a clear plot, including a problem that is resolved at the end. These stories follow a logical sequence of events, feature character development, and link the motivations and goals of the characters with the unfolding plot. However, Košutar et al. (2022) found significant differences between Croatian-speaking monolinguals aged 6 and 8, indicating that narrative abilities in this group continue to develop even after the age of 6. Similarly, Lindgren (2023) found comparable results with respect to the effect of age for both telling and retelling, suggesting continued development of narrative skills beyond age 6. Specifically, Swedish-speaking children aged 8 outperformed 6-year-olds on both storytelling and retelling tasks, further supporting the notion of ongoing narrative development during this

period. Thus, there seems to be greater agreement among research findings on early narrative development than on later stages, particularly between the ages of 5 and 7 and beyond.

1.2 Narrative abilities of children aged 5 to 7 years

Previous research has shown that, around the age of 6, children's narratives become more complex, and there is considerable variability in narrative production even within narrow age groups (Fiorentino & Howe, 2004). Describing narrative skills in detail at specific points in time, such as before entering school, provides valuable information not only for understanding narrative development but also for language assessment procedures.

Narrative macrostructure consists of various components, each serving different functions. When analyzed within story grammar models (e.g., Stein & Glenn, 1979), a narrative typically includes elements such as setting (time and place) and episodes. Each episode contains a central goal, which is considered a key element, along with additional components. According to the model presented in The Multilingual Assessment Instrument for Narratives (MAIN; Gagarina, Klop et al., 2019), these episodic components include an initiating event (internal state), goal, attempt, outcome, and reaction (internal state). By the age of five, children begin to produce attempts and outcomes more frequently (Lindgren, 2018; Trabasso & Nickels, 1992), and goals start to appear, though they are still infrequent (Soodla & Kikas, 2010; Trabasso & Nickels, 1992). At age six, children improve in their ability to mark settings and use internal state terms as initiating events (Lindgren, 2018), but their progress in marking goals (Lindgren, 2018; Soodla & Kikas, 2010) and internal state terms as reactions remains limited (Lindgren, 2018).

In terms of *episodic complexity*, specifically in producing sequences of core macrostructural components such as goals, attempts, and outcomes, research indicates that younger children, particularly those under the age of 5, often struggle to incorporate goals into their narratives (Khan et al., 2016). They tend to produce loosely linked descriptive and action sequences, connected using simple connectives (e.g., Berman & Slobin, 1994; Košutar & Hržica, 2021). By the age of six, narratives still rarely contain complete episodic structures, which within the MAIN framework consist of a goal, attempt, and outcome for a given episode, but children produce some kind of sequences like goal-outcome or goal-attempt. Lindgren (2018) reports that only 18% of the six-year-olds fail to produce any sequence. Five- and six-year-olds even occasionally produce complete episodes (attempt – goal – outcome), although this is rare as it occurs in only 11% of cases.

Finally, results from earlier studies (for an overview, see Lindgren, 2018; 2019) indicate that age-related development is not the same for different types of macrostructural components, and that it is important not only to analyze narratives in terms of an overall score for macrostructure but also to look more closely at different components of children's narratives. Given some overlaps but also some differences in the research findings on narrative development and the fact that many factors can influence this development, we should be cautious about generalizations without confirming existing research findings in different contexts, including different languages and cultures.

1.3 The relationship between core language skills and narrative development

Core language skills refer to the foundational abilities that underpin the comprehension and production of language, namely, grammar and vocabulary (e.g., Wilson & Bishop, 2022). There are different perspectives regarding the role of core language skills in the development of successful narrative. One widely accepted view argues that the macrostructure of a story – its overall organization and coherence – is closely related to both vocabulary and syntactic development (Bohnacker et al., 2020; Fiani et al., 2020; Hickmann, 2003; Karmiloff & Karmiloff-Smith, 2002; Sénéchal et al., 2008, Silva & Cain, 2024; Yang et al., 2023). This perspective suggests that children's ability to structure a narrative depends significantly on their language proficiency, particularly in vocabulary and grammar. On the other hand, a contrasting view posits that narrative macrostructure is less dependent on language-specific skills and more heavily influenced by broader cognitive abilities, such as memory and general problem-solving processes (Berman, 2001; Paradis et al., 2011; Trabasso & Nickels, 1992).

Despite this ongoing debate, a growing body of research strongly supports the idea that vocabulary and syntax are crucial in shaping the quality of young children's narratives. Lexical knowledge, in particular, plays an important role in enabling children to produce narratives that are clear and coherent, with appropriate references to characters, actions, and events (Uccelli & Páez, 2007). A richer vocabulary allows children to express ideas with greater precision, contributing to the overall clarity of their stories. Moreover, advanced grammatical knowledge, such as the ability to use complex sentence structures, helps children construct sentences that are logically connected and effectively organized. The use of appropriate connective devices, for instance, aids in creating a narrative flow, linking events in a way that is easy for listeners or readers to follow (Berman & Slobin, 1994; Eisenberg et al., 2008; Hickmann, 2004).

De Villiers and de Villiers (2000) argue that the ability to comprehend and convey causal and temporal relationships between events in a story may only develop after children acquire specific syntactic constructions. These constructions, such as subordinate clauses, are crucial for encoding complex relationships between events, allowing children to express how and why things happen in a narrative. For example, understanding how to link events causally (e.g., "because" or "so that") or temporally (e.g., "before," "after") can significantly enhance the coherence and depth of a story.

In sum, research consistently shows that as children's language skills, including both vocabulary and grammar, improve, there is a corresponding improvement in the quality, organization, and complexity of their oral narratives (Fiorentino & Howe, 2004; Khan et al., 2023; Sénéchal et al., 2008). Therefore, while cognitive processes undoubtedly play a role, the development of narrative macrostructure appears to be closely intertwined with language skills, especially during early childhood. In addition, some studies point out that the contribution of core language skills might differ with language status and age (e.g., Košutar et al. 2022; Lindgren & Bohnacker, 2020; 2022; Roch & Hržica, 2020) and that around six years of age narrative skills become more linked to overall language competence, including vocabulary and syntax.

2 Aim and research questions

Although studies have examined the development of story macrostructure through specific components, many rely only on composite scores. While findings are now available for several languages, general information on story structure and episodic complexity, as well as detailed descriptions of individual components, remains limited, particularly for underrepresented languages such as Croatian. Additionally, there are diverse perspectives on the role of core language skills in the development of effective narrative abilities. Some studies suggest that this relationship changes with age and development, and that around six years of age, narrative skills become more closely linked to overall language competence, including vocabulary and syntax. However, this shift requires further empirical investigation.

The current study aims to present the narrative skills of children in the final year before school (aged 5–7)[1] and to examine the effect of children's core language skills and age on their narrative abilities. The following research questions are asked:

- **RQ1**: What are the components of story structure that appear in the narratives produced by preschool children (aged 5–7), and what is their average story structure score?
- **RQ2**: How structurally complex are the narratives produced by preschool children (age 5-7)?
- **RQ3**: To what extent does receptive vocabulary, sentence comprehension, and age predict story structure in preschool children (aged 5–7)?

3 Method

3.1 Participants

The children in their final kindergarten year were recruited from kindergartens in Zagreb, Croatia. They were all monolingual children with typical language development (TD). To ensure the typical development of all participants, members of the kindergarten expert team, including a psychologist and a speech and language pathologist, were consulted. To additionally ensure that only TD children were included in the sample, those who scored two standard deviations below the average mean on standardized tests used in this research were excluded from the analysis ($N = 8$). The study thus ultimately included 38 children, all in their final preschool year (aged 5–7). Demographic characteristics of the participants can be found in Table 1.

[1] In Croatia, children typically begin primary school at the age of 6 or 7, depending on their birth date and developmental readiness. Consequently, the final year before school entry usually occurs between the ages of 5 and 7. This variation arises because children who are potential school enrollees and are born earlier in the calendar year (e.g., January to March) generally start school at age 6, while those born later (e.g., from April onward) are often considered for school entry in the following school year, thus beginning at age 7. Additionally, parental request or professional recommendations may sometimes lead to delays in school entry. By referring to 5–7 years of age as the final year before school entry, this paper accounts for the age variability within the Croatian educational system and captures the developmental stage immediately prior to formal schooling.

Table 1. Demographic characteristics of the participants

N_{total}	**Chronological age** (year; month)			**Gender**	
	M	***SD***	**Range**	**m**	**f**
38	6;3	0;6	5;1–6;11	20	18

3.2 Material

All children were assessed using two standardized language tests: the Croatian version of the *Peabody Picture Vocabulary Test* (PPVT-III-HR; Dunn et al., 2010, Kovačević et al., 2009) and the Croatian version of the *Test for the Reception of Grammar* (TROG-2: HR; Bishop et al., 2013, Kuvač Kraljević et al., 2014). The PPVT-III-HR assesses receptive vocabulary knowledge, i.e., vocabulary comprehension, while the TROG-2: HR test evaluates syntactic comprehension, specifically the understanding of sentences with varying syntactic complexity. Narrative samples were collected using the *Multilingual Assessment Instrument for Narratives* (MAIN; Gagarina, Klop et al., 2019), adapted to Croatian (Hržica & Kuvač Kraljević, 2020). The MAIN is part of the LITMUS battery, developed within COST Action IS0804, *Language Impairment in a Multilingual Society: Linguistic Patterns and the Road to Assessment* (Armon-Lotem, et al., 2015). Originally designed to assess narrative skills in children aged three to ten years, the instrument has also been shown to be suitable for adult assessment, with adults often not achieving maximal scores (e.g., Gagarina, Bohnacker et al., 2019; Hržica & Kuvač Kraljević, 2022; Leko Krhen et al., 2023). Thus, MAIN has proven effective in capturing developmental changes across different life stages in both research and clinical contexts. The instrument includes four stories designed to assess narrative comprehension and production through standardized procedures. Narrative production is evaluated through storytelling based on a visual template consisting of six separate images, which together form a cohesive picture story, allowing the child to create a narrative that integrates the individual images into a unified whole. Narrative comprehension is assessed via questions related to the story. In the present study, only narrative production was evaluated.

3.3 Procedure

The Croatian Ministry of Science and Education and the participating institutions (kindergartens) approved the study. Written informed consent was obtained from the parents, and the children provided verbal assent to participate. Children were tested individually in a quiet room. Only the participant and the examiner were present to minimize noise and interference from other children or external activities. The study procedure differed from that outlined in the MAIN manual (Gagarina, Klop et al., 2019). Instead of presenting paper versions of the stories, the assessment was done using a computer screen. The procedure was similar to the online testing procedure recommended on the MAIN website (e.g., Hamdani et al., 2021), but children were tested in-person. Each child chose a story from four colored squares displayed on a 15.60-inch screen. The child clicked on his or her choice of square, which initiated a PowerPoint® presentation. The setup was designed so the child believed the examiner did not know which story would be chosen. The child clicked on a square to select, with help from the examiner if needed. In reality, the examiner had already preselected the story. The same story

would be behind each of the squares the child would choose. Half of the participants were presented with the *Baby Goats* story, and the other half with the *Baby Birds* story. Only one of the two stories was used because the MAIN stories are carefully designed to align in linguistic and cognitive complexity (Gagarina, Klop et al., 2019). Although some studies (e.g., Lindgren, 2019) found higher story structure scores on *Baby Goats* than on *Baby Birds*, most of them (see Bohnacker & Lindgren, 2021; Lindgren, 2018) did not detect differences in narrative production between two stories. Furthermore, although Lindgren (2019) found that story structure scores were different, narratives told to the two stories had similar levels of episodic complexity. To control the effects of shared knowledge and joint attention, only the child was able to view the picture prompts during the storytelling. At the beginning of the task, the child viewed the entire set of six pictures in the middle of the screen. All the pictures were the same size. The sequence was then displayed across subsequent slides (two pictures at a time): first showing the initial two pictures, followed by the next two, and concluding with the final two. All that time the examiner pretended not to know the story. This mimicked the offline (paper) MAIN procedure. Unlike the paper version of MAIN or Kawar's et al. (2023) online procedure and following the procedure used by Košutar et al. (2022), the children could only view the two pictures currently on the screen. This decision was based on the author's clinical experience. In assessments with the online version of MAIN, younger children – especially those with short attention spans – often playfully press the buttons and jump from slide to slide. This behavior can disrupt the order of their stories. It can lead to incoherence by adding details about pictures whose plot the child has already explained. Preventing them from going back can help them to focus more on the task itself than on the means (e.g., the computer keyboard) used to set it. However, it was important to note that the child was told in advance that they would not be able to go back to the previous pictures. The stories produced by children were audio recorded.

3.4 Data analysis

All audio recordings were transcribed and analyzed using the CHAT system and the CLAN program from CHILDES (MacWhinney, 2000). Transcription and coding were done by trained native Croatian speakers. Repetitions, fillers, code-switching, nonwords, and hesitations were specially coded and excluded from analysis. All transcripts passed the CHECK function in the CLAN program. Inter-transcriber reliability was tested and found to be almost 90%, showing strong consistency in the transcription and coding process.

In the MAIN protocol, the story structure is assessed based on several key components, with a maximum of 17 points being awarded. Up to 2 points can be given for the setting, depending on how well the child establishes the time and place of the action, with 1 point awarded for stating the place and 1 point for stating the time in which the story takes place. The expression of the internal states as initiating events, goals, attempt, resolution and internal states as reaction are each worth up to 3 points each in the MAIN protocol. One point can be awarded for each of these components in all three situations that make up the entire story. Therefore, the five components (internal state as initiating event, goal, attempt, outcome, and internal state as reaction), each of which can appear and receive a point up to three times (i.e., in three different story situations), contribute a total of 15 points. Together with 2 points for the situation, for the

story structure one can achieve a maximum score of 17 points. The internal state as an initiating event sets the plot of the story in motion, leads the characters towards their goal and provides the framework for the narrative. This initiates the characters' journey or the unfolding of events. Next, the characters make attempts to reach their goal, and in the end the situation (or problem) is resolved – the goal is either reached or not. The internal states as reactions describe how the characters respond to the resolution of the story and reflect their emotional or psychological reactions.

In analysing episodic complexity, the highest episodic complexity reached by the child (out of three episodes) was assessed, as suggested by Gagarina, Klop et al. 2019. This focuses on the types of sequence children can produce rather than how many times they have produced the structure. This approach is important because a child may understand less of a particular episode or may have had difficulty paying attention during the task. Our goal was to determine only the highest level of episodic complexity that a child can achieve in storytelling: a child can produce no sequences, a two-element sequence not including Goal (Attempt-Outcome), Goal without other components (Attempt and/or Outcome), a two-element sequence including Goal (Goal-Attempt or Goal-Outcome) or a complete Goal-Attempt-Outcome sequence. Receptive vocabulary and sentence comprehension were assessed using standard scores from standardized tests. All analyses were performed in IBM SPSS version 26.0 (IBM, 2019). A linear regression analysis was performed to investigate the effect of age, receptive vocabulary and sentence comprehension on the story structure score. All prerequisites for the regression analysis were met: the relationships between all variables were linear, there was no multicollinearity among the explanatory variables (all variance inflation factors (VIFs) were less than 2, and the tolerance values were higher than 0.2), the residuals followed a normal distribution and were homoscedastic. The Durbin-Watson statistic was 2.1, supporting the assumption of independent errors and adding confidence to the model's robustness. During the preparation of the analysis, one outlier was identified: a child with a story structure score of 2. As this is only a single score and the results are generally close together due to the small age range of the participants, this outlier is likely to be noticeable but will probably not significantly affect the results of the analysis. Therefore, this score was not excluded from further analysis.

4 Results

This section first presents the results of the descriptive statistics, including the participants' receptive language skills and the characteristics of the macrostructure of the narratives they produced. The results of the linear regression analysis are then presented, showing the effects of language skills (vocabulary and sentence comprehension) and age on the story structure of the produced narratives.

4.1 Descriptive statistics

Here, the participants' receptive language skills and the characteristics of the macrostructure of narratives they produced are described.

4.1.1 Receptive language skills

Receptive language skills were assessed using the previously described standardized tests. Table 2 shows the results of the 38 children who passed these tests, achieving scores within ±1 SD. Results are expressed as standard values (scores).

Table 2. Receptive language skills result of participants measured by standardized tests[2]

Standardized language test	Language skills test measures	Standardized score		
		M	***SD***	**Range**
PPVT-III-HR (*M*=100, *SD*=15)	vocabulary comprehension	118.63	11.73	96-141
TROG-2:HR (*M*=100, *SD*=15)	syntactic comprehension	100.83	8.89	86-115

4.1.2 Narrative production skills

Total scores of story structure and scores of story structure by episode can be seen in Table 3. Out of a total score of 17, participants average score on story structure was *M* = 5.73 with standard deviation of *SD* = 1.90. Narrative production scores of story elements in each episode can be found in Table 4. It is evident that the children of the observed age in this study focus more on the objective events in the story (attempts and outcomes) and less on the characters' perspective of their goals and internal states that motivate their behavior or arise as a consequence of the outcomes. The results indicate that participants achieved the highest success in the third episode, possibly again demonstrating the children's peak focus on the story's resolution and outcome. The results for the episodic complexity categories can be found in Figure 1. At the level of descriptive results, the findings are grouped according to the categories available in the MAIN protocol (complexity categories listed on the scoring form). As described earlier, the highest level of complexity achieved by the child is reported, beginning with the Attempt-Outcome sequence, followed by Goal, then Goal combined with another component (e.g., Goal-Attempt or Goal-Outcome), and finally the most complex category, full Goal-Attempt-Outcome sequence (full episode). Most participants are at the lowest level of episodic complexity, typically expressing the link between attempt and outcome without specifying the characters' internal states and goals leading to these attempts, or the internal states that follow them.

Table 3. Descriptive statistics for the story structure score

	Story structure score		
	M	***SD***	**Range**
Setting (Max = 2)	0.03	0.16	0–1
Episode 1 (Max = 5)	1.50	0.95	0–3
Episode 2 (Max = 5)	2.05	1.01	1–5
Episode 3 (Max = 5)	2.16	0.72	1–3
Total score (Max = 17)	**5.73**	**1.90**	**2-10**

[2] Please note that ±1SD, i.e. standard scores between 85 and 115, are considered average, which means that the child has passed the test. Scores below 85 and above 115 reflect results that are below and above average, respectively.

Table 4. Frequency of macrostructural components produced in narratives

Story element (possible score range)		**0** ($n_{participants}$)	**1** (n+%$_{participants}$)
Setting (A1)	Time of action (0-1)	37	1 (2.63%)
	Place of action (0-1)	38	0 (0.00%)
Episode 1 (A2-A6)	A2: Internal state as initiating event (0-1)	27	11 (28.95%)
	A3: Goal (0-1)	31	7 (18.42%)
	A4: Attempt (0-1)	21	17 (44.74%)
	A5: Outcome (0-1)	16	22 (57.89%)
	A6: Internal state as reaction (0-1)	38	0 (0.00%)
Episode 2 (A7-A11)	A7: Internal state as initiating event (0-1)	32	6 (15.79%)
	A8: Goal (0-1)	23	15 (39.47%)
	A9: Attempt (0-1)	10	28 (73.68%)
	A10: Outcome (0-1)	12	26 (68.42%)
	A11: Internal state as reaction (0-1)	35	3 (7.89%)
Episode 3 (A12-A16)	A12: Internal state as initiating event (0-1)	35	3 (7.89%)
	A13: Goal (0-1)	37	1 (2.63%)
	A14: Attempt (0-1)	1	37 (97.37%)
	A15: Outcome (0-1)	11	27 (71.05%)
	A16: Internal state as reaction (0-1)	23	15 (39.47%)

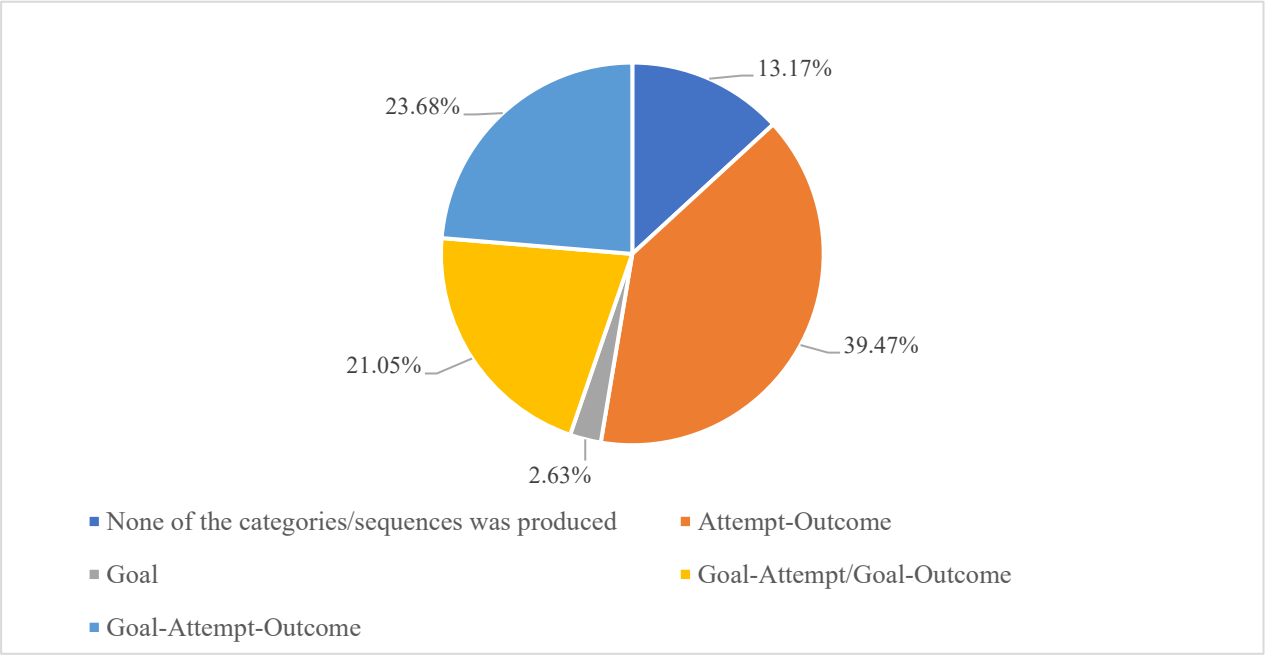

Figure 1. Percentage of participants reaching each category of episodic complexity

4.2 Effects of language skills and age on story structure

In the model, receptive vocabulary, sentence comprehension and age were entered as predictors and story structure as dependent variable. Receptive vocabulary, sentence comprehension or age are not independently statistically significant predictors of the story structure score. Furthermore, even entered together as predictors they do not explain a significant part of the

variance in the dependent variable, i.e., story structure score. For details of the model, see Table 5.

Table 5. Model specification for the effects of age and language skills on the story structure score

Predictors	*B (SE)*	*β*	*t*	*p*	Model Summary
receptive vocabulary	.03 (.04)	.16	.941	.35	$R = .38$
sentence comprehension	.00 (.03)	.00	.026	.98	Adj. $R^2 = .12$ $F(3, 34{,}37) = 1.486$
age	.09 (.05)	.27	1.590	.12	$p = .24$

5 Discussion

This study examined the narrative abilities of 38 monolingual Croatian children during the final preschool year period (age 5 to 7), a period of time marked by rapid development in language and storytelling. We focused on the story structure score as well as the different components of story structure and on episodic complexity. Additionally, the predictive role of children's receptive language skills and age for narrative macrostructure was investigated. Receptive language skills were measured using standardized tests translated and adapted for Croatian (PPVT-III-HR, TROG-2: HR), while narrative production was assessed story structure measures based on the MAIN instrument (Gagarina, Klop et al., 2019), translated and adapted to Croatian (Hržica & Kuvač Kraljević, 2020).

The results showed that our participants, children in their final preschool year in Croatia, aged 5 to 7, still rely heavily on objective events – such as attempts and outcomes – when storytelling. They express goals, character intentions, perspectives, and internal states less frequently. At this age, an asymmetry remains in their storytelling between what happened (events) and why it happened, including reasons, explanations, and the emotional consequences certain events evoke. These results are consistent with findings from previous studies (Lindgren, 2018; Stadler & Ward, 2005; Trabasso & Nickels, 1992), which report that as narrative skills develop gradually, children aged 5 to 6 begin to produce stories that follow a logical sequence of events with a clear plot, including a problem that is resolved at the end. In contrast to Lindgren (2018), we found that children more frequently produce internal states as reactions rather than as initiating events. In her study, children produced outcomes more frequently than children in this study, although the results varied significantly depending on the group, considering the age and language(s) of her monolingual and bilingual participants. The monolingual groups of 5- and 6-year-old Swedish children in her study, which were the best comparison to our participants due to their alignment in both age and language background (being monolingual), expressed outcomes in more than 80% of cases. In contrast, our participants expressed outcomes in just over 40% of cases. This discrepancy could be attributed to cultural, linguistic, and educational factors, suggesting that Croatian children sometimes tend to present internal states as reactions, treating them as effects in the cause-effect structure of their narratives, and therefore sometimes produce them instead of outcomes themselves. What is surprising is that only one child in our study specified a single component of the setting. A further comparison with the monolingual participant group in Lindgren (2018) showed that although the younger children in her study often omit details about the setting, older children

incorporate this element into their narratives with increasing frequency (from around 10% at the age of 4 to around 30% at the age of 6). This development reflects a growing understanding of narrative structure and the importance of context in storytelling. However, this trend could, among other linguistic and cultural peculiarities that might impact these differences, also suggest that the inclusion of setting components depends on storytelling experience and education about narrative structure. The fact that this was not the case in our study may be related to the absence of instruction on narrative structure, even in its spontaneous, implicit, and experiential forms. The narratives of the children who participated in this study differed from those in previous research in terms of the usage of story structure components, possibly due to the cultural and linguistic context of the study. As Neuman and Dickinson (2001) emphasize, narrative development is shaped by cultural norms and educational practices, with formal education systems playing a significant role in fostering or constraining these opportunities. Unlike other countries (e.g., Finland, Australia), in the Croatian education system, narrative skills are not explicitly highlighted in the preschool curriculum. This may lead to stories lacking certain components, such as the setting.

In terms of episodic complexity, many children in our sample (39.47%) produced Attempt-Outcome sequences as their highest level of complexity. This supports the idea that young children often struggle to incorporate goals into their narratives (Khan et al., 2016). The fact that only 2.63% of children in our sample produced only the goal(s) suggests that once children can produce goals, they quickly integrate them into more complex sequences or combine them with attempts and/or outcomes. Consequently, 21.05% of children in our sample were able to produce Goal-Attempt-Outcome sequences. However, 23.68% of our participants were still at the level of Goal-Attempt or Goal-Outcome sequences, indicating that even at around age 6, many children's narratives still rarely contain complete episodic structures, as also shown in previous research (Lindgren, 2018). Additionally, some children around that age still produce no sequences or goals (as seen in our research, 13.1%).

In the present study, receptive vocabulary, sentence comprehension and age did not predict story structure. The results of this study contrast with those studies that found an impact of age on story structure (Berman & Slobin, 1994; Bohnacker et al., 2022; Fiorentino & Howe, 2004; Lindgren, 2019; Lindgren & Bohnacker, 2022). One possible explanation for this finding is that, in our context, considering the specific characteristics of both the language and the educational system, children aged 5 to 7 years may not yet show clear developmental differentiation, i.e. statistically significant changes in narrative production, as reported in previous studies. This may be because, in Croatia, kindergarten education is not mandatory, and even those who do attend preschool are exposed to a curriculum that lacks clear guidelines and expectations for supporting and developing narrative abilities. Since children usually begin formal schooling at the age of 7, and explicit instruction in narrative skills is not systematically provided before that, it is possible that the developmental gains observed in studies conducted in other educational contexts, where schooling starts earlier or narrative abilities are more actively fostered in preschool, are not yet present in our sample. In the Croatian context, more substantial changes in narrative abilities may occur between ages 7 and 8, following the start of formal education, which may also explain why Košutar et al. (2022) found differences between

Croatian children aged 6 and 8, with eight-year-olds outperforming six-year-olds in measures of narrative macrostructure. It is possible that if a wider age range had been included in this study, age would have played a more significant role. Lindgren and Bohnacker (2022), for example, in their research that included children aged 4–6, observed that age-related effects on the macrostructure of narratives were more pronounced in bilingual children when younger children were compared with older children. It is possible that within the age range of 5 to 7 years, other factors such as individual language skills, task demands or exposure and engagement in storytelling have a greater influence on narrative production than age alone.

It is important to note that our participants all came from a few different kindergartens (all located in the same city), which means that they were exposed to similar programs, activities and interactions with their peers. This homogeneity of the sample limits the generalizability of our findings to the wider population. Including children from different preschools with different programs and environments could provide more diverse data and allow for a better understanding of narrative skill development in a broader context. This suggests that while age is an important factor, its influence on narrative development may be less pronounced whereas other variables such as language proficiency and language exposure (Bohnacker et al., 2022) and (pre)school experience play a greater role. Furthermore, the influence of age on narrative production may depend on the type of narrative task used. As Lindgren and Bohnacker (2021) argue, narrative tasks that involve complex language structures or require greater cognitive effort may not show age-related effects unless the children have reached a certain threshold in their linguistic and cognitive development. The MAIN protocol used in our study captures narrative skills that may be influenced by the demands of the task (Lindgren, 2023), which vary depending on each child's experience with storytelling.

Results from the present study indicate a need to consider other perspectives, i.e., factors that could have an effect on storytelling. For example, that could be general cognitive abilities like memory and problem-solving rather than language-specific skills (e.g., Berman, 2001; Paradis et al., 2011; Trabasso & Nickels, 1992). Moreover, it should be taken into account that vocabulary and grammar are complex skills and that general measures such as standardized tests used in this study might not be precise enough to capture aspects of core language skills relevant for narrative production. For example, the Croatian receptive vocabulary test PPVT-II-HR used in this study has been standardized. However, Kuvač Kraljević et al. (2015) reported slightly skewed results in their validation study when compared to the national preschool population the test was originally standardized on. Their sample showed an average standard PPVT score of 112.19, which contrasts with the scores of the population used to validate the Croatian version of the test. Over time, it seems that the PPVT-II-HR has become less sensitive, likely due in part to language and cultural changes. As a result, children often achieve relatively high scores for their age group (e.g., Hržica & Roch, 2020). Silva and Cain (2024) suggest using measures such as knowledge of discourse markers or coherence relations that may be more sensitive in capturing narrative production changes in children. It is also important to note that many studies, including this one, often search for a connection between receptive language abilities and narrative production skills. However, the level and extent of vocabulary and

syntactic production might serve as better predictors of narrative production than receptive skills alone.

Finally, results of this study highlight the need to monitor early literacy development and to identify and support children with language difficulties at an early stage, especially given the importance of narrative skills for later academic success. The age range of the children who took part in our study is of crucial importance in the Croatian education system, as it corresponds to the period in which children are assessed before they start school. By recognizing the expected level of narrative abilities at this age, we can identify and differentiate children at risk for later difficulties at school age, which may help prevent language disorders or reduce their severity.

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