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Syntactic Complexity of L2 Story Production in Minority Children with Mild Intellectual Disability: Quantitative and Qualitative Analysis

Original research article

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Abstract

Narrative analysis holds significant value in the assessment of bilingual populations, including both typically developing and clinical groups, such as national minorities who often speak the language of their country of residence as a second language. The present study aimed to compare the syntactic complexity of narratives in the Croatian language produced by Roma national minority children with mild intellectual disability (n = 16) and their typically developing Croatian chronological (n = 16) and language age (n = 16) peers. This study was conducted in accordance with the Ethical Code of the University of Zagreb. Narratives were elicited using the MAIN instrument. Roma children demonstrate diminished performance in the mean length of communication unit and the mean length of clause compared to both control groups, while they only perform below their chronological typically developing peers on the clausal density measure. The most prevalent syntactic error observed was the omission of sentence elements. Establishing connections among clauses in their second language appears to a lesser challenge than constructing complex sentences.

Keywords: *bilingualism, intellectual disabilities, narrative microstrucutre, Roma national minority*

Narrative ability allows the speaker to construct stories. It relies on an interplay of cognitive, social, and linguistic skills and continues to develop throughout childhood. Narrative analysis is typically conducted at two levels: macrostructure, which examines the overall story structure, and microstructure, which assesses linguistic

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elements such as syntactic complexity. The latter is particularly relevant in evaluating language development, as syntactic complexity progresses with age and cognitive maturation. While typically developing (TD) children exhibit increasing syntactic complexity with age, children with intellectual disabilities (ID) demonstrate delays, producing shorter and structurally simpler narratives.

Bilingualism introduces additional considerations, particularly in minority populations such as the Roma in Croatia. Roma children, who typically acquire Croatian as a second language (L2) upon entering school, face challenges due to limited exposure to L2 and a lack of formal education in their first language (L1). This linguistic and educational background affects their syntactic development and narrative abilities. Additionally, Roma children with ID remain largely understudied, with existing research suggesting that their performance in Croatian lags behind their monolingual ID peers in multiple linguistic domains. However, no studies have examined their narrative abilities, particularly regarding syntactic complexity.

This study aims to investigate differences in syntactic complexity in narratives produced by Roma children with ID who speak Croatian as an L2 and TD children with Croatian as an L1. By analyzing measures such as mean length of communication units, mean clause length, clausal density, and syntactic errors, the study seeks to determine whether TD children with Croatian as L1 produce more syntactically complex narratives, contributing to a better understanding of bilingualism, ID, and narrative development in minority populations.

Narrative Abilities with an Emphasis on Syntactic Complexity

Narrative ability represents an individual's ability to convey or recount a personal or fictional story (Schoenbrodt et al., 2016). It is an integral component of overall language ability (Channell et al., 2015; Dobravac & Zuliani Blaskovic, 2022), effective social functioning (McCabe & Bliss, 2003) and academic achievement (Zanchi et al., 2020). In order to comprehend and produce narratives, it is essential to demonstrate a level of cognitive, social and linguistic abilities and to integrate them effectively.

The development of narrative ability is concomitant with the maturation of the cognitive abilities that are fundamental to its development (Bedekovic et al., 2021; Dobravac & Zuliani Blaskovic, 2022; Lucero, 2018). Given its continued development throughout the school-age period, it is considered a later-developing language ability. In light of the existing evidence indicating that language, cognitive and social abilities are integrated during the process of narrative construction (Zanchi et al., 2020), the assessment of a child's narrative sample can provide insight into their development in aforementioned domains (Bryant et al., 2016**)** in a relatively natural context (Gagarina et al., 2019)**,** making it highly valuable tool in both research and clinical practice (Heilmann et al., 2010; Hao et al., 2018).

In accordance with the model proposed by Stein and Glenn (1979), narrative abilities can be analysed at two levels: macrostructure and microstructure (Altman et al., 2022). The microstructural level of analysis is concerned with the features of language employed in the construction of a narrative, such as the complexity of produced syntactic structures. In contrast, the macrostuctural level of analysis is concerned with the elements of the story structure itself (Bedekovic et al., 2021; Dobravac & Zuliani Blaskovic, 2022; Hao et al., 2018; Lucero, 2018). The two levels are considered to be interrelated. As Dobravac & Zuliani Blaskovic (2022) posit, in order for a child to be able to produce elements of the macrostructure of a story, they must have a sufficient level of microstructure, such as syntax and vocabulary in a given language.

The microstructural analysis of a narrative text comprises an evaluation of the lexical and grammatical structures used to convey the story content (Channell et al., 2015). This analysis may include the assessment of syntactic complexity, along with productivity and lexical diversity (Bedekovic et al., 2021). There is evidence that the syntactic complexity of children's expressions undergoes a process of change and development, ultimately leading to a greater degree of complexity (Bedekovic et al., 2021). While typically developing (TD) preschool children most commonly produce

syntactic structures of a lesser degree of complexity that are largely unrelated, the early school age period is characterised by an increase in the degree of connectivity observed in these structures. To illustrate, dependent sentences, which require the organisation and connection of complex content into a syntactic unit, develop up until approximately the age of 12 (Berman, 2018). Therefore, their use can provide information on the level of syntactic development (Trtanj & Mikic Colic, 2018).

The analysis of syntactic complexity may be conducted in either a quantitative or qualitative manner. In order to conduct an accurate analysis of narrative samples, including an evaluation of their syntactic complexity, it is essential to ensure that the transcriptions are correct. For a quantitative approach to the analysis, it is essential to divide the speech into units that are suitable for analysis (Bedekovic et al., 2021). This can be achieved through a twofold approach: firstly, by considering sound characteristics (pauses and intonation) and secondly, by employing syntactic criteria. The latter enables the division of the string of speech into T-units, communication (C)-units, as well as clauses, and the calculation of their average length, providing information on their complexity (Bedekovic et al., 2021). Moreover, the clausal density measure provides data regarding the frequency of dependent connections within narratives. The syntactic criteria are frequently the preferred option due to the lesser degree of individual variation between transcribers (Reed et al., 2001). The aforementioned measures are significant indicators of syntactic development (Nippold, 1993).

In addition to quantitative analysis, the syntactic errors can be analysed qualitatively to provide more in-depth information about which specific errors are commonly produced by certain populations (e.g., Botting, 2002; Paradis, 2005). Such an analysis provides insight into the individual's grammatical competence and potential language impairments. Errors can be categorized based on their nature, such as syntactic omissions, word order violations, or incorrect morphosyntactic markings. Comparing these errors across different populations, such as monolingual Croatian speakers and Croatian-Roma bilingual speakers with and without ID, can contribute to our understanding of syntactic development in these groups. This can help both in further understanding their profile of narrative ability and in possible differential diagnosis.

Bilingualism and Minority Languages

A bilingual or multilingual individual is one who is able to communicate in an active or passive manner in two or more languages acquired from birth or at varying points in the lifespan (Wei, 2008). The existing body of research on bilingual children has provided insights into the particular characteristics of this group and their language development trajectory (see, for example, Bialystok et al., 2003; Kay-Raining Bird et al., 2016; Myers-Scotton, 2006). The advantages of bilingualism are manifold and include enhanced executive control skills, such as the ability to switch between tasks. Conversely, one of the areas where bilingualism may be less advantageous is in extended lexical access (Bialystok, 2010). The phenomenon of language transfer, whereby speakers interchange the structures that are present in their languages, is a common occurrence in this group (Vujnovic Malivuk & Palmovic, 2015). This transfer can affect syntactic features, for instance, word order. It is of particular importance to assess the language abilities of bilingual individuals in all of their languages in order to prevent erroneous conclusions being drawn as a result of inadequate acknowledgement of the specific characteristics of this population.

Linguistic Characteristics and Social Context of the Roma National Minority in the Republic of Croatia

National minorities, frequently speaking a language that differs from the official language of the country in which they are resident as a first language (L1), represent a specific subset of the bilingual population. The Roma minority represents one such minority in the Republic of Croatia, where this study was conducted. This minority frequently resides in segregated villages and their cultural values diverge from those of the majority population, frequently fostering stereotypes pertaining to them (Hrvatic, 2004).

A distinctive feature of the Boyash language, their L1, and Romani culture is its

orality, whereby both are primarily passed down through spoken word and oral tradition (Kyuchukov & de Villiers, 2018). From an early age, Roma children are introduced to complex grammatical structures and are expected to develop their L1 vocabulary and comprehension of complex syntax. The current state of knowledge regarding the linguistic components of the Boyash language and its typical and atypical development within the Roma minority is severely limited, potentially due to the language's primarily oral tradition. With regard to their second language (L2), Croatian, the official language of Croatia, the majority of individuals first become exposed to it on a regular basis upon the beginning of their elementary education (Martan & Srebacic, 2020). This form of bilingualism is referred to as sequential bilingualism (Jelaska, 2005). The presence of linguistic interference of Boyash, Croatian dialects and standard Croatian is observable at the lexical and morphosyntactical levels (Radosavljevic, 2016). Pragmatic abilities of the TD Roma population, including narrative ability, have yet to be documented in either their L1 or L2. Additionally, the phenomenon of code mixing is evident among the Roma population, particularly among those with increased exposure to the majority language (Radosavljevic, 2010, 2012). To date, there is no availability of education in L1 for Roma children, whereas the systematic exposure to Croatian, the language of education, starts at the same time as their elementary education. While there are clear advantages to early inclusion of this group in the preschool educational system, with benefits such as earlier exposure to L2 (Potocnik et al., 2020), only 23% of Roma children have the opportunity to do so (Government of the Republic of Croatia, Office for Human Rights and Rights of Nationa Minorities, 2021). It follows, therefore, that Roma children are required to acquire the language components of their L2, which differs from their L1, concurrently with the educational curriculum taught in that language. The lack of opportunities for education in the L1, coupled with the scarcity of professionals who are native speakers of the Boyash, precludes the possibility for Roma children to utilise their L1 abilities to acquire educational content (Kyuchukov, 2021). Furthermore, their bilingualism is frequently perceived as an impediment (Kyuchukov & de Villiers, 2018), largely due to the prevailing stigma and the marginalised status of this minority itself and their L1. These students are frequently placed in ethnically segregated classes, subjected to discrimination and educated in special educational programmes. Thus, they are denied access to educational content and opportunities to practise L2 skills through communication with Croatian peers (Potocnik et al., 2020).

In consideration of the aforementioned educational circumstances, it is unsurprising that the educational attainment of the Roma population is frequently low, while the school dropout as well as unemployment rate, and prevalence of poverty are relatively high (Tahiri & Kregar Oreskovic, 2021).

Linguistic Features of Persons with Intellectual Disability

The American Psychiatric Association (2013) defines intellectual disability (ID) as a "neurodevelopmental disorder with onset during the developmental period that includes both intellectual and adaptive functioning deficits in conceptual, social, and practical domains" (pp. 33). The severity of these deficits is contingent upon the level of adaptive functioning. According to Nair et al. (2022), the prevalence of intellectual disabilities (ID) is 1.39% of the population. Several studies have identified social conditions (Emerson, 2012), such as low socioeconomic status (SES), as risk factors for the development of ID. Additionally, individuals from lower SES backgrounds, which often includes underprivileged minorities such as the Roma minority, are more likely to be identified as persons with intellectual and learning disabilities (Tzouriadou et al., 2019).

A substantial body of research has identified children with ID presenting with delayed language development, with their communication and language abilities reaching a plateau at a significantly lower level than their TD peers (e.g. Slovenc & Ocurscak Zulicek, 2024; Abbeduto & Thurman, 2022; Ocurscak Zulicek et al., 2022; Koizumi et al., 2019). Their vocabularies are usually smaller and dominated by concrete nouns (Gregorieva & Cholakova, 1996). Syntactic development is approximately one to three years delayed

relative to mental age peers (Koizumi et al., 2019). Moreover, their productive syntax is delayed when assessed in relation to both their mental age and syntactic comprehension abilities and is dominated by simple sentences. When considering narration, research has also shown limitations in narrative abilities, suggesting they might be an area of weakness in overall communication abilities (Slovenc & Ocurscak Zulicek, 2024; Barton-Hulsey et al., 2017).

Bilingualism, Id and Syntactic Complexity of Narratives

While certain measures of narrative production are more comparable in various languages spoken by bilingual children, mainly referring to macrostructural measures, measures of microstructure (vocabulary and morphosyntax) are believed to be language-specific (Gagarina et al., 2016; Rodina, 2016) and therefore less susceptible to language transfer. With regard to narrative comprehension, both monolingual and bilingual children frequently demonstrate superior abilities in this domain in comparison with production. Among bilingual children, those with greater exposure to their L1 tend to exhibit enhanced comprehension of certain questions, attributable to their more nuanced grasp of its complex grammatical structures (Rodina, 2016). The microstructure of bilingual children's narratives is typically characterised by reduced number of words, particularly verbs, and shorter C-units, in comparison to monolingual children. These same differences are also evident in narratives in their L1 and L2 when there is a discrepancy in the amount of exposure to each language. There are currently no studies examining Roma children's narrative abilities in terms of syntactic complexity in either their L1 or L2. In a study by Kyuckukov (2021), it was found that Roma children residing in Bulgaria produce longer narratives than their peers from Slovakia. The author attributes this difference in performance to differences in inclusion into the majority community and preschool education availability.

Children with ID have been shown to perform similarly to their TD peers in measures of macrostructure (Finestack & Abbeduto, 2010; Altman et al., 2022), while in the area of microstructure they progress in the measures of lexical diversity, but not in syntactic complexity or narrative length (Cleave et al., 2012). Finestack & Abbeduto (2010) suggested that average number of words of children with ID is the same as TD younger children. The syntactic structures produced by children with ID are most commonly simple sentences containing subject and verb, while object is often omitted (Altman et al., 2022). In conclusion, the narratives produced by children with ID tend to be shorter and less complex. Although the number of studies examining narrative abilities in children with intellectual disabilities (ID) is limited, there is virtually no research examining bilingual children with ID, particularly minority children such as Roma. Two studies on this particular group have indicated that their performance in Croatian, their L2, is at a lower level than that of their Croatian peers with ID in the areas of phonology, morphology, syntax, and certain aspects of pragmatics, such as narration, but have employed only elicitation task of declension or used teacher completed checklist, but not children's production, especially in a more natural context (Ocurscak Zulicek et al., 2022; Slovenc & Ocurscak Zulicek, 2024). Nevertheless, there is no existing data concerning their performance in their L1. Given the importance of narrative abilities for both every day and academic functioning, it is crucial to examine and gain a deeper understanding of these abilities in this group in order to provide adequate support (Barton-Hulsey et al., 2017).

Aim and Problems

Research of narrative ability in bilingual populations show differences in narration on the level of microstructure. Research aimed at investigating narrative ability in persons with ID show weaker narrative ability in this population. There is almost no research that shows the development of narrative ability in persons of the Roma nationality as bilingual population, and therefore also in persons of the Roma population with ID. Applying the measures of the mean length of the communication unit, the mean length of the clause, the clausal density and the analysis of syntactic errors, this article aims to gain an insight into the differences in narration between Roma children with ID with Croatian as L2 and typically developing

(TD) children with Croatian as L1 of equal chronological and language age on measures of syntactic complexity. We expect that TD children with Croatian as L1 will tell stories with higher syntactic complexity. Additionally, we wish to explore what kind of syntactic errors can be observed in narratives of both TD children and Roma children with ID. Examining syntactic complexity in narratives of bilingual Roma children with intellectual disabilities addresses a significant research gap, but also provides insights that can inform future assessment tools and intervention strategies for linguistically and cognitively diverse minority populations.

Methodology

The sample consisted of 48 school-aged children, divided into three groups: (1) a group of Roma children with mild intellectual disability, (2) a control group of children matched for chronological age, and (3) a control group matched for language age. Each group included 16 participants, specifically 9 boys and 7 girls. The mean age and age range of participants are presented in Table 1. The inclusion criteria for the group of Roma children with mild ID were an established diagnosis of mild ID and participation in speech-language therapy for at least one year (range: 1 year 2 months to 5 years 5 months: mean duration: 2 years 3 months). Intellectual status was determined based on the „Decision on the Appropriate Educational Program“, “a document which comprises assessments from multiple professionals, including psychologist. Data for this group were collected at the „Center of Upbringing and Education Cakovec“ by center staff due to ethical restrictions. Data for the participants in the control groups were obtained from the CHILDES Croatian MAIN Narrative Corpus (Hrzica & Roch, 2021). Roma children were matched with participants in the control group matched for language age using scores from the Test for Reception of Grammar (TROG-2:HR). The results of the Roma children on the TROG-2:HR were below average for their chronological age.

This study was conducted in accordance with the Ethical Code of the University of Zagreb. Ethical approval was obtained from the Ethics Committee of the Faculty of Education and Rehabilitation Sciences, University of Zagreb (Approval No. 602-04/17-42/7) for the project Multilevel approach to spoken discourse in language development (UIP-2017-05-6603).

Table 1.
Basic Information About Participants

Group	Chronological age (range)	Chronological age (average)
Roma children with ID	9;04 – 13;09	11;06
Control group matched for chronological age	9;09 – 11;0	10;08
Control group matched for language age	3;08 – 5;03	4;06

Assessment Instrument

The Multilingual Assessment Instrument for Narratives (MAIN) (Hrzica & Kuvac Kraljevic, 2020; Gagarina et al., 2019) is a tool to assess narrative abilities in children acquiring one or more languages from birth or an early age. The instrument comprises four stories, each presented to children as a picture-based narrative task. Research by Hrzica & Kuvac Kraljevic (2020) demonstrated that the Croatian adaptation of MAIN is an effective tool for evaluating narrative abilities in Croatian speakers across a wide age range, from preschool children to adults.

In this study, the stories „Goats“ and „Birds“ from MAIN were used as the primary assessment tool. Participants were asked to narrate either the „Goats“ or „Birds“ story, and their narrations were audio-recorded. The recordings were transcribed using the CLAN (MacWhinney, 2000) software with the CHAT coding system. Following transcription and coding, analyses were conducted within the CLAN program.

Calculation of Measures

Measures of syntactic complexity for each participant were calculated in the software program Computerized Language

Analysis (CLAN). It is developed as a part of the CHILDES (Child Language Data Exchange System) project for the transcription, coding, and analysis of spoken language data (MacWhinney, 2000). Measures that were calculated are: the mean length of communication unit, the mean length of clause and the clausal density. Command MLU was used in the CLAN program for calculation of measures. Spoken sequence can be divided into C-units (Loban, 1976) as a way to analyze spoken language, particularly for studying the structure of spontaneous speech. A C-unit consists of an independent clause and any of its modifiers, including dependent clauses. It is commonly used in language research to segment spoken language for analysis, especially with children.The mean length of C-unit is a measure that shows the ratio of the total number of words in all C-units and total number of C-units. In this study, spoken sequence was divided into C-units.

Example of dividing spoken sequence into C-units is:

C-unit 1: one day she was walking in the park

C-unit 2: and saw who was stealing flowers

Spoken sequence can also be divided in clauses. A clause is defined as a syntactic structure consisting of a subject and a predicate. Regardless of whether a clause is independent or dependent, each clause that includes a predicate is considered a separate syntactic unit. After segmenting the spoken sequence into individual clauses, the mean length of a clause can be calculated by dividing the total number of words across all clauses by the total number of clauses. Example of dividing spoken sequence into clauses is:

Claues 1: one day she was walking in the park

Claues 2: and saw

Clause 3: who was stealing flowers

The calculation of mean lengths for these units provides information about syntactic complexity (Bedekovic et al., 2021). An increase in the mean length of C-unit indicates that a person produces more syntactic elements within a clause, more dependent clauses, or both. In contrast, the mean length of a clause specifically reflects complexity within a clause itself (Casal & Lee, 2019).

Clausal density (Scott, 2006) is a measure that represents the ratio of the total number of clauses to the total number of C-units. C-units can include multiple clauses, especially when dependent. This ratio offers insight into the proportion of dependent clauses within a narrative.

During transcription, syntactic errors were coded in the CLAN software using the CHAT coding system. They were also noted in the Excel table for each participant and classified according to the type of (morpho)syntactic error. The errors that the participants produced are: omission of part of the sentence, wrong word order in the sentence, incomplete sentence, the excess of words, omission of invariable words, incorrect use of proposition, incorrect use of a conjunction, incorrect marking of case, and incorrect marking of gender.

Data Processing Methods

The obtained data were analyzed in IBM SPSS Statistics for Windows (Version 26.0) (IBM Corp., (2019) for statistical data processing. The data analysis included both inferential and descriptive statistics. The normality of distribution was assessed using the Shapiro-Wilk test which indicated that the distribution was normal for the results on the measure of clause length. A parametric test was applied in the analysis of this measure (One-way ANOVA). On the other hand, it is established that distribution is not normal for results on the measures of mean length of the communication unit, clausal density and the number of syntactic errors. For these measures, a nonparametric test was used (Kruskal-Wallis test).

Results

The Mean Length of the Communication Unit

Descriptive statistics showed that Roma children with ID (C = 3.84, SD = 1.21) use shorter C-units on average compared to the control group matched for chronological age (C = 6.62, SD = 1.35) and also to the control group matched for language age (C = 5.62, SD = 0.65). The highest mean length of C-unit is achieved in the control group matched for chronological age (max. = 8.87), and the lowest in Roma children with ID (min. = 2.00). The results of descriptive statistics are shown in Table 2.

Table 2.
Descriptive Statistics for the Measure of the Mean Length of C-Unit

Group	*C*	*SD*	Min.	Max.
Roma children with ID	3.84	1.21	2.00	5.86
Control group matched for chronological age	6.62	1.35	4.36	8.87
Control group matched for language age	5.62	0.65	3.47	5.87

Further analysis showed that results were different, with a large effect on the mean length of C-unit between the groups ($x^2(2) = 26.197$, $p < 0.001$, $\eta^2 = 0.541$). Post hoc analysis indicated statistically significant differences in the mean length of C-unit between Roma children with ID (mean rang = 11.59) and the control group matched for chronological age ($p < 0.001$), favoring the control group (mean rang = 36.91). Additionally, significant differences were found between Roma children with ID and the control group matched for language age (mean rank = 25.00), with the control group showing higher results ($p = 0.020$).

The Mean Length of a Clause

Descriptive statistics showed that Roma children with ID (M = 3.67, SD = 1.09) use shorter clauses on average compared to the control group matched for chronological age (M = 5.44, SD = 0.63), and also to the control group matched for language age (M = 4.99, SD = 0.66). The highest mean length of clause is achieved in the control group matched for chronological age (max. = 6.65), and the lowest in Roma children with ID (min. = 2.00). The results of descriptive statistics are shown in Table 3.

Table 3.
Descriptive Statistics for the Measure of the Mean Length of a Clause

Group	*M*	*SD*	Min.	Max.
Roma children with ID	3.67	1.09	2.00	5.38
Control group matched for chronological age	5.44	0.63	4.07	6.65
Control group matched for language age	4.99	0.66	3.25	5.86

Further analysis showed that results were different, with a large effect on the mean length of clause between the groups (Welch(2, 28.874) = 15.346, $p < 0.001$, $\eta^2 = 0.496$). Post hoc analysis indicated statistically significant differences in the mean length of clause between Roma children with ID and the control group matched for chronological age ($p < 0.001$). Roma children with ID use shorter clauses (M = 3.67, SD = 1.09) compared to the control group matched for chronological age (M = 5.44, SD = 0.63). Additionally, statistically significant differences were found between Roma children with ID and the control group matched for language age in the mean length of clause ($p = 0.001$). Roma children with ID use shorter clauses (M = 3.67, SD = 1.09) compared to the control group matched for language age (M = 4,99, SD = 0.66).

The Clausal Density

Descriptive statistics showed that Roma children with ID (C = 1.00, SD = 0.95) achieved lower results on average in clausal density compared to the control group matched for chronological age (C = 1.23, SD = 0.18). The highest clausal density is achieved in a control group matched for chronological age (max. = 1.62). The results of descriptive statistics are shown in Table 4.

Table 4.
Descriptive Statistics for the Measure of the Mean Length of a Clause

Group	*C*	*SD*	Min.	Max.
Roma children with ID	1.00	0.95	1.00	1.29
Control group matched for chronological age	1.23	0.18	1.00	1.62
Control group matched for language age	1.06	0.08	1.00	1.22

Further analysis showed that results were different, with a large effect on the clausal density between the groups (x^2 (2) = 14.954, $p < 0.001$, $\eta^2 = 0.318$). Post hoc analysis indicated statistically significant differences in the clausal density between Roma children with ID (mean rank = 17.10) and the control group matched for chronological age (p = 0.001), favoring the control group (mean rang = 34.75). There is no statistically significant difference in the clausal density between Roma children with ID and the control group matched for language age (p = 1.000).

The Number of Syntactic Errors

Descriptive statistics showed that Roma children with ID (C = 4.00, SD = 3.36) produce more syntactic errors on average in narration compared to the control group matched for chronological age (C = 1.00, SD = 1.41), and also to the control group matched for language age (C = 3.00, SD = 1.88). The highest number of syntactic errors is achieved in Roma children with ID (max. = 11). The results of descriptive statistics are shown in Table 5.

Table 5.
Descriptive Statistics for the Measure of the Number of Syntactic Mistakes

Group	*C*	*SD*	Min.	Max.
Roma children with ID	4.00	3.36	0	11
Control group equalized according to chronological age	1.00	1.41	0	4
Control group equalized according to language age	3.00	1.88	0	7

Further analysis showed that results were different, with a large effect on the number of syntactic errors between the groups (x^2 (2) = 11.909, $p < 0.003$, $\eta^2 = 0.258$). Post hoc analysis indicated statistically significant differences in the number of syntactic errors between the control group matched for chronological age (mean rank = 15.16) and Roma children with ID (p = 0.002). favoring Roma children with ID (mean rank = 31.50). These results demonstrate that Roma children with ID make statistically more errors (mean rank = 31.50) than their Croatian peers. There is no statistically significant difference in the number of syntactic errors between Roma children with ID and the control group matched for language age (p = 1.000).

Qualitative Analysis of Syntactic Errors

Qualitative analysis of syntactic errors is shown in Table 6. The most common syntactic error in Roma children with ID is the omission of part of the sentence (subject, predicate or object) (N = 37). This is also the most common syntactic error in a control group matched for language age (N = 27), and the second most common in this group is the omission of invariable words (conjunction, preposition, adverb). The second most common syntactic error in Roma children with ID is the wrong word order in the sentence (N = 19). The most common syntactic error in the control group matched for chronological age is the excess of words. The other syntactic errors that are produced by Roma children with ID and control groups are incomplete sentences, incorrect use of a preposition or a conjunction. Roma children with ID also produce morphosyntactic errors such as incorrect marking of gender or case.

Table 6.
Type of (morpho)syntactic Errors

Type of (morpho)syntactic error	Roma children with ID	Control group matched for chronological age	Control group matched for language age
Omission of part of the sentence („onda onda je došla ona. / onda jede travu.“)	42	1	28
Wrong word order in the sentence („jede ptičica kravu.“)	19	7	7
The excess of words („onda je lisica je boli.“)	6	7	6
Omission of function words („onda tata išla vodu.“)	6	4	8
Incorrect use of a preposition („sad je koza išla za nju.“)	1	1	0
Incorrect use of a conjunction	0	2	0
Incorrect case marking („lisica viče na konj.“)	1	0	0
Incorrect gender marking („ovaj je bila u vodu.“)	1	0	0

Discussion

This study aimed to investigate the syntactic complexity of narratives told by bilingual Roma children with mild intellectual ID. We expected weaker results when compared to typically developing monolingual Croatian children, both with the group of children paired by chronological age and with the group paired by language age. The comparison with monolingual age-matched children (bilingual ID vs. monolingual typically developing) controls for developmental expectations based on chronological age. It allows researchers to assess whether bilingual children with ID exhibit delayed or different developmental patterns relative to their typically developing peers. The comparison with monolingual language-matched children (bilingual ID vs. monolingual typically developing) allowed us to compare groups based on actual linguistic ability rather than chronological age. In that way we ensured that any differences observed are more likely attributable to bilingualism rather than overall cognitive impairment. Additionally, this method allows for a more precise comparison of language development across different linguistic backgrounds while controlling for baseline language proficiency.

Three different domains of syntactic complexity were explored. First, we examined a general measure of syntactic complexity: the mean length of the communication unit. This measure reflects both clause complexity and the complexity of inter-clause connections. The results showed that bilingual Roma children with ID performed worse than both control groups. Second, we analyzed the mean length of clause, which specifically indicates the complexity of syntax within individual clauses. Once again, bilingual Roma children with ID performed worse than both control groups. The third measure, clausal density, assessed the presence of subordinate clauses within children's narratives. Here, bilingual Roma children with ID performed worse than the age-matched control group. However, there was no significant difference between them and the language-matched control group.

These findings suggest that bilingual Roma children with ID differ from their peers both in the complexity of syntax within clauses and in the way clauses are connected. Their difficulties in both areas indicate that they struggle not only with constructing complex individual clauses but also with integrating multiple clauses into coherent, hierarchically structured discourse. The comparison with the age-matched control group suggests that the syntactic abilities of bilingual Roma children with ID are affected by their intellectual disability and potentially by their bilingualism. Intellectual disability is known to impact language development by

limiting the ability to process, organize, and produce complex syntactic structures (e.g. Georgieva & Cholakova, 1996; Koizumi et al., 2019; Slovenc & Ocurscak Zulicek, 2024). Additionally, bilingualism in this population may introduce further challenges, particularly as there is reduced exposure to Croatian language (Slovenc & Ocurscak Zulicek, 2024). The cumulative effect of these factors may contribute to weaker syntactic performance relative to their typically developing, monolingual peers of the same age.

The comparison with language-matched peers, who are younger but demonstrate similar basic language abilities, provides additional insight into the difficulties with syntactic complexity of bilingual Roma children with ID. Bilingual Roma children with ID exhibited differences in clause complexity but not in inter-clause connections. This suggests that while their ability to construct structurally complex clauses lags behind even that of younger children with similar overall language abilities, their ability to link clauses together is more comparable. The absence of significant differences in clausal density between bilingual Roma children with ID and the language-matched control group implies that both groups demonstrate similarly low levels of syntactic subordination. This may indicate that subordinate clauses emerge at a later stage of language development and require a higher level of linguistic and cognitive resources than these children currently possess. Alternatively, it could reflect general constraints related to intellectual disability, which may limit the ability to produce and integrate subordinate structures regardless of bilingual status. This is comparable with previous studies. Koizumi et al. (2019) discovered that the development of syntax in children with ID was significantly delayed than in typically developing children with the same mental age (MA). However, when reaching the MA of 7-9, syntax abilities started to develop remarkably.

A qualitative analysis of error types provides a more nuanced picture. Roma children with ID most often omit parts of sentences, indicating difficulties with the cognitive and lexical demands required for narration. In contrast, children in the control group matched for chronological age almost exclusively produce complete sentences. However, children in the control group matched for language age also frequently omit parts of sentences, making this their most common error. The second most common error across all three groups is incorrect word order, though it is far more frequent in Roma children with ID than in the two monolingual control groups. The use of excessive words is observed in similar numbers across all groups, as is the omission of function words, although this occurs less frequently in monolingual children matched for chronological age. Other errors, such as incorrect use of prepositions, conjunctions, case marking, and gender marking, appear only occasionally.

The analysis of syntactic and morphosyntactic errors showed that Roma children with ID make more errors than TD children matched for chronological age but do not differ from the control group matched for language age. The specific demands of the narrative task most often resulted in unfinished sentences and incorrect word order among children with ID. They rarely made morphosyntactic errors but sometimes added excessive words or omitted function words. Children in the control group matched for chronological age occasionally produced errors in word order and excessive words and more rarely omitted function words. However, they had far fewer issues with word order than Roma children with ID and the other control group, and they almost never left sentences unfinished. Children in the control group matched for language age most often produced incomplete sentences. They also made errors in word order (though not as frequently as Roma children with ID), used excessive words, and omitted function words.

Roma children with ID and younger children matched for language age exhibited a high number of false starts—instances where an utterance is initiated but abandoned before the thought is completed. Such elements, similar to other mazes and disfluencies (e.g., Fiestas et al., 2005), can indicate cognitive load, difficulties in linguistic planning, and language proficiency (e.g., Fichman & Altman, 2023). Disentangling the role of each of these factors in the increased number of false starts among Roma children with ID is challenging. However, the results suggest that they

struggle with structuring a coherent narrative, as frequent false starts disrupt the flow of their storytelling.

Taken together, these results highlight the severity of deficits in narration, a skill that requires the integration of various cognitive and linguistic abilities, including working memory, syntactic planning, and discourse organization. The fact that bilingual children with ID struggle with narration even when compared to younger, language-matched peers suggests that their challenges are particularly pronounced in contexts that require the coordination of multiple linguistic and cognitive processes. Our findings highlight specific areas of syntactic vulnerability in bilingual Roma children with ID, emphasizing the need for targeted language interventions that support both clause-level complexity and the development of multi-clausal structures.

This study has several limitations. First, we did not collect data on the Roma children's language experience or exposure to Croatian. Because of this, the children were not matched based on their amount of exposure to Croatian as a second language. Second, the Roma children with intellectual disabilities were tested only in Croatian, their second language, because there is no version of the MAIN (Multilingual Assessment Instrument for Narratives) in Bayash, their first language. The lack of suitable assessment tools in Bayash made it impossible to evaluate them in both of their languages. Another challenge is the absence of bilingual speech-language therapists who speak both Bayash and Croatian, further limiting the possibility of a bilingual assessment. As a result, we could not compare narrative skills in both languages, even though this would be important for a full understanding of the language abilities of bilingual Roma children with ID. Finally, the study did not include Croatian-speaking children with mild ID, meaning we could not compare the narrative skills of bilingual speakers with ID to those of monolingual Croatian speakers with ID. To address this, we introduced two control groups: one matched for language ability (allowing us to observe the impact of ID) and one matched for age (enabling us to examine differences caused by both bilingualism and ID). However, we acknowledge that including additional control groups would have allowed for more precise conclusions.

The findings of this study offer several implications for future research and clinical practice. First, they highlight the importance of investigating narrative abilities in bilingual children with intellectual disabilities, a population that remains largely underrepresented in the literature. Narratives are a key component of both academic success and everyday communication, as they integrate linguistic, cognitive, and social skills. By documenting the syntactic complexity of bilingual Roma children's narratives, this study provides a foundation for future research on developmental trajectories and for outlining specific linguistic profiles of bilingual minority children with ID. These results also have practical relevance, as they may guide speech-language pathologists and other experts in identifying areas of particular vulnerability (e.g., clause-level complexity and sentence completeness) and in tailoring interventions that directly target these domains. Furthermore, the study underscores the necessity of creating assessment instruments and educational materials in both the minority and majority languages of bilingual children. Addressing this gap could help reduce the risk of misdiagnosis and ensure that children's abilities are accurately represented. More broadly, the results enrich the existing literature by connecting two strands of research, namely bilingualism and intellectual disability, that are rarely examined together. In doing so, they provide concrete insights into the linguistic vulnerabilities of Roma children with ID, which can help experts adapt assessment practices, refine intervention strategies, and better support children growing up in linguistically and cognitively diverse minority communities. Given the complexity of both bilingualism and ID, further research is necessary. Such research should include a range of ID severity levels and language pairs in bilinguals to adress the generalizability of the findings.

Conclusion

Narrative abilities are essential not only for academic success but also for effective communication in everyday life. As children progress through elementary school, they must comprehend and produce

narratives with increasingly complex macrostructural and microstructural features. The assessment of narrative abilities serves as a valuable tool in both research and clinical contexts, particularly for bilingual populations, as it provides insight into language use in natural settings (Gagarina et al., 2015). In the case of bilingual children, it is crucial to assess both of their languages to avoid misdiagnoses, especially in areas related to language impairments (Gagarina et al., 2016).

This study contributes to the understanding of syntactic complexity in the narratives of Roma children with intellectual disabilities (ID) in Croatian as their second language. The findings indicate that the narratives of this population are characterized by shorter communication units and clauses, lower clausal density, and a higher frequency of syntactic errors. These results suggest that Roma children with mild ID produce narratives with limited syntactic complexity, which may reflect both their bilingual status and cognitive challenges. Understanding these patterns is crucial, as it allows for a comparison with typically developing (TD) peers and other bilingual populations, shedding light on the specific linguistic difficulties faced by Roma children with ID. This study is particularly valuable as it addresses a significantly underresearched population. The bilingual experience of Roma children with ID is highly specific, as they acquire Croatian, their second language, primarily in an educational setting and often with limited exposure in early childhood. Unlike many bilingual groups, they lack access to formal education in their first language, which may impact their linguistic development in both languages. While narrative abilities in bilingual children and individuals with ID have been studied separately, there is a lack of research on how these factors interact in minority populations such as Roma children with ID. By providing insight into their syntactic abilities in Croatian, this study helps fill a critical gap in the literature and contributes to a better understanding of language development in underrepresented bilingual groups.

As narrative ability is a cornerstone of both academic achievement and everyday communication, future research building on these findings may contribute to the development of more precise assessment tools and targeted interventions, ultimately helping practitioners address the specific needs of bilingual children with intellectual disabilities.

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