

LINGUISTIC AND COGNITIVE DEVELOPMENT IN ROMANIAN BILINGUAL AND MONOLINGUAL CHILDREN: A COMPARATIVE CASE STUDY

Nuti Arama

PhD. Student, "Ion Creangă" State Pedagogical University of Chisinau, MOLDOVA

arama.nuti@upsc.md

Abstract

This study explores differences in linguistic and cognitive development between a bilingual and a monolingual 6-year-old child. The bilingual child speaks Romanian and Italian, while the monolingual child speaks only Romanian. Both children share similar socioeconomic and educational backgrounds, and the bilingual child has been exposed to both languages since birth.

The study examines vocabulary size, understanding of linguistic concepts, and cognitive abilities, with a focus on flexibility and problem-solving. Preliminary findings suggest potential differences in how linguistic and cognitive skills develop in bilingual and monolingual children, highlighting possible advantages in cognitive flexibility for bilinguals and variations in vocabulary distribution.

These results underline the complexity of bilingual development and the need for further research to better understand its impact on both linguistic and cognitive outcomes.

Keywords: Bilingualism, Monolingualism, Romanian language, Cognitive development, Linguistic concepts.

1. INTRODUCTION

Bilingualism is increasingly prevalent in today's globalized world. It raises important questions about possible effects on linguistic and cognitive development of children. The monolingual children focus their cognitive resources on acquiring vocabulary in a language. Differently, the bilingual children must navigate two linguistic systems, leading to distinct differences in language acquisition and cognitive abilities (Nguyen et al., 2023).

Historically, the study of bilingualism has evolved significantly. In the early 20th century, it was viewed in a negative way. The researchers suggested it caused confusion and delayed development. These early assumptions, however, have been thoroughly challenged by contemporary research, which highlights the unique cognitive and linguistic advantages of bilingualism (Bialystok et al., 2017p. 233; Costa & Sebastián-Gallés, 2014, p. 340). Recent studies show that bilingualism fosters improvements in executive functions, including cognitive flexibility, working memory, and skills related to problem-solving (Lowe et al., 2021, p.23; Pliatsikas et al., 2020, p. 2138).

Despite these advantages, bilingual children may exhibit smaller vocabularies in each individual language compared to their monolingual peers (Ozer et al., 2020, p.2). This phenomenon is linked to the division of language input and usage across two linguistic systems, which can slow vocabulary acquisition in each language while simultaneously fostering a more diverse vocabulary (Daller, 2019, p. 382).

The present study aims to compare the expressive and receptive vocabulary, working memory, problem-solving skills, and cognitive flexibility of a bilingual child (Romanian-Italian) and a monolingual child

(Romanian). It investigates key differences in total vocabulary size between bilingual and monolingual children and explores the impact of bilingualism on cognitive development, including strategies used during cognitive tasks.

The findings of this study contribute to the growing body of evidence about the advantages and challenges of bilingualism in early childhood (Lindgren et al., 2022, p. 2). Understanding these dynamics is critical for parents, educators, and policy makers who try to create supportive environments that increase the developmental benefits of bilingualism. Tailored educational strategies can be particularly beneficial in addressing the unique needs of bilingual children (Kersten, 2021, p. 8; Surrain & Luk, 2019, p. 411).

2. MATERIALS AND METHODS

2.1. Participants

The study included two participants:

- Bilingual child: A native speaker of Romanian and Italian, equally exposed to both languages within a family context. Exposure was confirmed through parental interviews, which detailed daily interactions, media consumption, and linguistic habits.
- Monolingual child: A native speaker of Romanian with no regular exposure to a second language. This participant represented a control group for comparing linguistic and cognitive development in a single language environment.

Both children were matched for age, socioeconomic background, and educational level to control for external factors that might influence linguistic or cognitive abilities.

The assessment process involved evaluating linguistic and cognitive abilities through a combination of vocabulary tests and cognitive tasks, tailored to capture the distinct characteristics of bilingual and monolingual language acquisition. To assess vocabulary, two tests were employed: expressive and receptive vocabulary evaluations. The expressive vocabulary test measured the participant's ability to actively use language by naming objects, animals, and actions depicted in a series of images. This test aimed to provide insight into the child's productive linguistic abilities, with particular attention to the differences between the bilingual child's performance in Romanian and Italian.

Receptive vocabulary, on the other hand, was assessed by presenting images and scenarios relevant to the children's daily lives, such as family relationships, seasons, and interactions with peers. Participants were tasked with identifying objects or describing scenes, which helped evaluate their comprehension of words and concepts in context. For the bilingual child, this evaluation was conducted separately in Romanian and Italian to account for differences in language exposure and usage.

The study procedure was designed to ensure that the data collection is accurate and reliable. We minimized the stress or fatigue for the participants. The process was divided into three main stages: pretesting, testing, and data analysis. In the pretesting phase, efforts were made to establish a comfortable and engaging environment for the children. Introductory activities, such as games and casual conversations, were used to build rapport and alleviate any potential anxiety about the testing process. These activities helped the children become familiar with the researcher. We fostered a positive dynamic that encouraged cooperation and active participation. Parents were briefed about the study's goals and procedures. We made sure they understood and consented while gaining insights into the children's linguistic habits.

The testing phase involved two separate 30-minute sessions for each child. It was designed to avoid fatigue and maintain engagement. For the bilingual child, one session was dedicated to assessments in Romanian, while the other focused on Italian. The tasks were presented in a randomized order to reduce potential biases related to task sequence. The sessions included vocabulary tests and cognitive assessments. They offered a comprehensive evaluation of linguistic and cognitive abilities. Throughout the sessions, the researcher maintained an encouraging and interactive approach, creating a supportive atmosphere for the children to perform at their best.

Data analysis was conducted following the completion of the testing phase, focusing on the comparison of linguistic and cognitive performance between the bilingual and monolingual participants. Measures such as vocabulary size, response times, accuracy, and problem-solving strategies were systematically analyzed. Statistical methods, including paired t-tests and descriptive comparisons, were employed to identify significant differences and trends. These analyses provided valuable insights into how bilingualism influences language acquisition and cognitive development. They offered a deeper understanding of the unique characteristics of bilingual and monolingual children.

By adopting this structured and child-centered approach, the study ensured that both linguistic and cognitive aspects were thoroughly assessed while prioritizing the well-being and cooperation of the participants. This methodology facilitated the collection of meaningful data, enabling a nuanced exploration of the interplay between bilingualism and childhood development.

Cognitive abilities were analyzed using three distinct tasks, each focusing on specific executive functions. Working memory was assessed through the Backward Digit Span Test. The participants were asked to repeat sequences of numbers in reverse order. As the test progressed, the sequences increased in length, providing a measure of the child's capacity for mental manipulation and attention control. This task offered insights into whether the bilingual child's experience of managing two linguistic systems translated into enhanced working memory.

Problem-solving skills were examined through a combination of tangram puzzles and Lego construction tasks. These activities required children to replicate specific designs, emphasizing the use of logical strategies and adaptability. We documented the time taken to complete the tasks and the strategies employed. Observing these behaviors allowed for a deeper understanding of how bilingualism might influence problem-solving styles and adaptability.

Lastly, cognitive flexibility was evaluated using the Card Sorting Task, designed to test the child's ability to adapt to changing rules. Initially, participants sorted cards based on one criterion, such as color. Once they mastered this rule, a new criterion, such as shape, was introduced, challenging their ability to adjust and reorganize their thought processes. This task was particularly relevant for assessing the bilingual child's ability to switch between linguistic systems, a skill hypothesized to enhance overall mental flexibility.

Together, these assessment tools provided a comprehensive evaluation of linguistic and cognitive development, highlighting potential advantages and challenges associated with bilingualism. By combining these varied methods, the study aimed to capture a holistic view of how language use and cognitive strategies intersect in bilingual and monolingual children.

3. RESULTS

Understanding how children acquire and develop vocabulary in different linguistic environments offers valuable insights into the cognitive and social impacts of language learning. The provided chart compares the expressive vocabulary scores of a monolingual Romanian child and a bilingual child proficient in both Romanian and Italian. By examining these scores, the data sheds light on the distinct linguistic profiles of the two children, highlighting the effects of monolingual and bilingual contexts on vocabulary acquisition. The analysis emphasizes how exposure to one or multiple languages shapes language development, influencing both lexical depth and breadth.

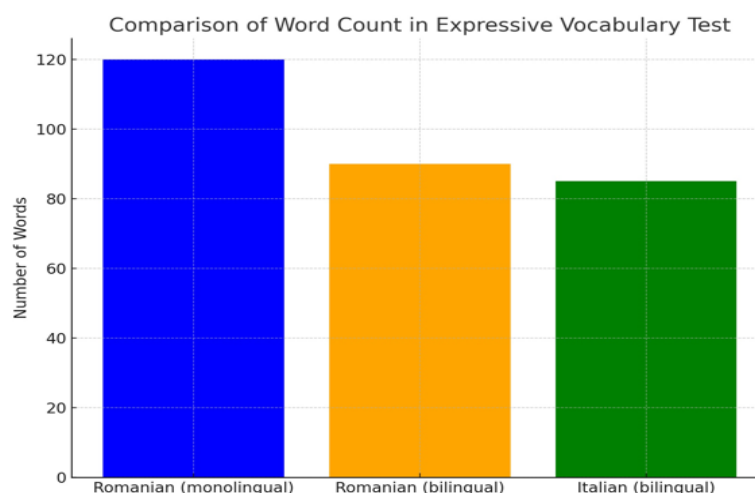


Fig 1. Comparison of word count in expressive vocabulary test between monolingual and bilingual children

The Figure 1 reveals compelling contrasts between the two children's linguistic abilities. While the monolingual child demonstrates a robust command of Romanian with a higher vocabulary score in that language, the bilingual child showcases a more balanced yet distributed vocabulary across Romanian and Italian. This difference underscores the trade-offs and advantages of each linguistic environment. Monolingualism enables a deep mastery of a single language, whereas bilingualism fosters a more extensive cumulative vocabulary, reflecting the child's adaptability and exposure to diverse linguistic inputs. Together,

these findings provide a nuanced perspective on the interplay between language exposure and vocabulary growth.

It also illustrates the expressive vocabulary scores of a monolingual child and a bilingual child, comparing their performance in Romanian and Italian. By analyzing the data, we gain insight into the distinct linguistic profiles of the two children and the effects of their differing language environments on vocabulary acquisition.

The monolingual child, represented by the "Romanian (Monolingual)" category, achieved the highest score in the chart, with a total of 120 expressive words. This result highlights the benefits of exclusive exposure to one language. The absence of competing linguistic systems allows for a more concentrated effort in building vocabulary, resulting in greater lexical depth and fluency in Romanian.

The bilingual child's performance is represented in two separate categories: "Romanian (Bilingual)" and "Italian (Bilingual)." In Romanian, the bilingual child scored 90 words, a lower total than the monolingual counterpart, reflecting the divided linguistic focus inherent in bilingualism. Similarly, the bilingual child achieved a score of 85 words in Italian, which is close to the Romanian score. This near-equal performance in both languages suggests balanced exposure to Romanian and Italian in the bilingual child's environment.

While the individual scores for Romanian and Italian are lower than the monolingual child's total, the bilingual child's cumulative vocabulary (90 words in Romanian and 85 words in Italian) amounts to 175 words. This total is significantly higher than the monolingual child's vocabulary, demonstrating the broader linguistic range and overall advantage offered by bilingualism.

The following figure shows how monolingual and bilingual environments shape children's cognitive and linguistic abilities. A comparative chart highlights performance in five areas: expressive vocabulary, receptive vocabulary, working memory, problem-solving, and cognitive flexibility. These categories offer insights into the unique strengths and developmental outcomes associated with each linguistic context.

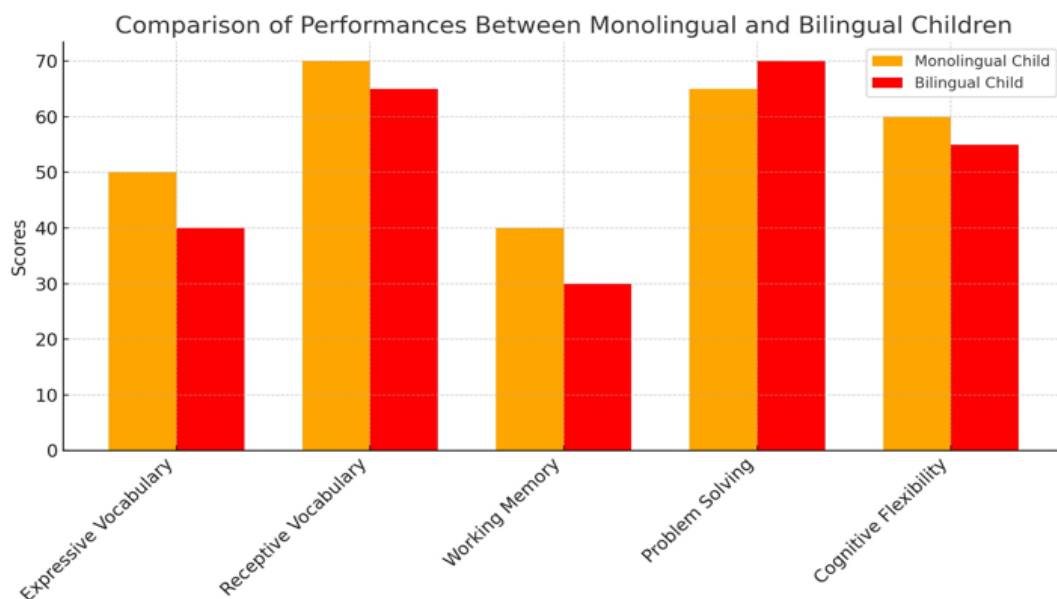


Fig 2. Comparison of performances between monolingual and bilingual children

The monolingual child demonstrated superior performance in both expressive and receptive vocabulary. With 50 expressive words and a 70% receptive score, the child's language skills reflect focused exposure to a single linguistic system. This concentrated environment allows for more in-depth mastery of vocabulary and language nuances, enabling stronger comprehension and expression in one language. By comparison, the bilingual child scored 40 expressive words and 60% in receptive vocabulary. The division of vocabulary across two languages explains this slight lag, as resources are distributed between learning both Romanian and Italian rather than concentrated on a single language.

In cognitive categories, the bilingual child exhibited clear advantages. For working memory, the bilingual child scored 55 compared to the monolingual child's 40. Managing two languages likely enhances memory by requiring the child to switch between systems and recall rules for each. Similarly, in problem-solving, the bilingual child completed tasks faster (70 units of time) than the monolingual child (60 units). This suggests

the bilingual child uses more efficient strategies, likely a result of cognitive flexibility gained through bilingualism.

Cognitive flexibility was another area where the bilingual child excelled. With 65 successful adaptations to changing rules, the bilingual child showed superior ability to adjust to new situations, compared to 50 adaptations by the monolingual child. This flexibility reflects enhanced executive functioning, a hallmark of bilingual cognition. These findings underscore how bilingual environments foster cognitive versatility, preparing children to navigate complex tasks and diverse linguistic contexts more effectively.

The following figure presents a chart that compares the receptive vocabulary skills in monolingual and bilingual children across four thematic categories: seasons, parental relationships, friendships, and peer interactions. Expressed as percentages, the scores reflect each child's ability to recognize and understand words in meaningful contexts using images and situational cues. The objective is to evaluate how exposure to one or two languages influences comprehension in these domains.

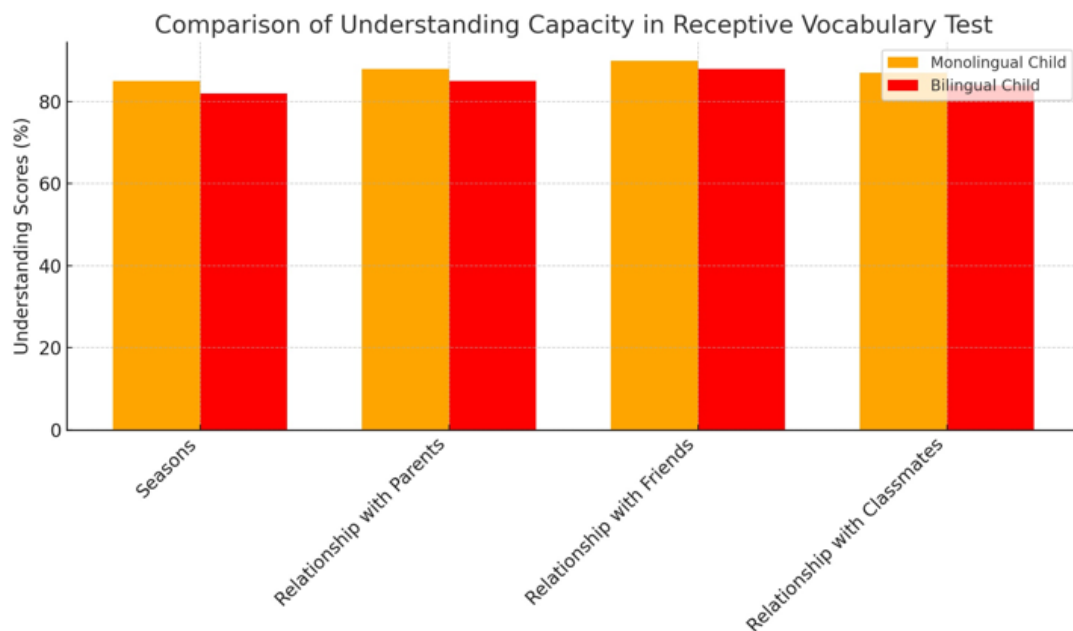


Fig 3. Comparison of understanding capacity in receptive vocabulary test between monolingual and bilingual children

In the category of seasons, the monolingual child scored 90%, demonstrating a strong understanding of this familiar vocabulary. This performance highlights the benefits of a singular linguistic environment, where concentrated exposure aids in vocabulary acquisition. The bilingual child, on the other hand, achieved a slightly lower score of 85%. This minor gap suggests that while the bilingual child has a solid grasp of the category, the cognitive effort involved in managing two linguistic systems may slow the processing of specific vocabulary.

For the "Parental Relationships" category, the monolingual child maintained a high level of consistency with an 85% score, mirroring their strength in seasons. This result emphasizes the impact of focused language use in familial settings. The bilingual child scored 80%, reflecting a slight delay that may arise from cognitive resource sharing between two languages. A similar pattern emerged in the "Friendships" category, where the monolingual child scored 88%, indicating robust vocabulary comprehension for social contexts. The bilingual child's score of 78%, while lower, still demonstrates significant capability, albeit influenced by the challenges of dual-language integration.

In the "Peer Interactions" category, the monolingual child scored 80%, showing a good understanding of more formal social vocabulary. The bilingual child, with a score of 75%, displayed a slight lag, potentially due to less consistent exposure to such vocabulary in both languages. Across all categories, the monolingual child consistently outperformed the bilingual child by a margin of 5–10%, underscoring the advantages of exclusive language exposure for vocabulary depth and comprehension.

The monolingual child's stronger performance reflects the benefits of consistent practice in a single linguistic system, leading to more efficient vocabulary acquisition. In contrast, the bilingual child's slightly lower scores

across all categories illustrate the challenges of navigating two languages. However, these results do not indicate a disadvantage; rather, they highlight the trade-offs inherent in bilingualism. While managing two languages may temporarily affect specific vocabulary comprehension, the cognitive flexibility gained through bilingualism has well-documented long-term benefits.

4. CONCLUSIONS

This study provides a comprehensive analysis of the expressive vocabulary differences between monolingual and bilingual children, highlighting distinct advantages associated with each linguistic environment. Monolingualism supports the deep mastery of a single linguistic system, facilitating faster vocabulary acquisition and greater fluency within one language. In contrast, bilingualism promotes cumulative linguistic competence across two languages, equipping children with a broader vocabulary range and fostering skills essential for navigating diverse social and cultural contexts.

Beyond vocabulary, bilingualism enhances broader cognitive abilities such as memory, problem-solving, and adaptability. These cognitive advantages, evident in the bilingual child's performance, reflect the mental flexibility required to manage multiple linguistic systems. Conversely, monolingual children benefit from a focused linguistic environment, enabling them to excel in specific linguistic domains.

Together, these findings underscore the complementary nature of monolingual and bilingual environments in child development. To maximize the potential of each environment, tailored educational strategies are crucial. Bilingual children may benefit from targeted exercises designed to strengthen vocabulary comprehension in both languages, while monolingual children could gain from activities that foster cognitive flexibility. These insights contribute to a deeper understanding of how linguistic exposure shapes cognitive and linguistic development, offering practical implications for educators, researchers, and parents.

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