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## MEMORY ACQUISITION IN FRENCH VS. ALBANIAN AMONG HIGH-IQ AUTISTIC CHILDREN (AGES 9–15) IN ALBANIAN SCHOOLS: A COGNITIVE-LINGUISTIC STUDY

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**Abstract:** Autism Spectrum Disorder (ASD) comprises a range of neurodevelopmental differences, often involving challenges in communication, sensory processing, and social engagement. Within this spectrum, high-IQ autistic children—commonly termed “twice exceptional”—demonstrate unique cognitive profiles, including pronounced strengths in rule-based reasoning, visual memory, and linguistic pattern recognition. These attributes are particularly evident when language instruction is explicit and systematic.

This study explores bilingual language acquisition in high-functioning autistic children aged 9 to 15 in Albania. Specifically, it compares their grasp of linguistic structures in French—a formally taught foreign language—with their native Albanian. A cohort of thirty students enrolled in six public schools with established French curricula participated in the research.

The methodology included assessments of vocabulary retention, morphological processing, narrative skills, executive function (EF), and theory of mind (ToM) in both languages. Tasks were administered across several sessions to ensure consistency and reliability.

Results reveal that older participants achieved near-parallel proficiency in French and Albanian vocabulary and morphological understanding. Narrative analysis showed enhanced complexity in French over time, correlating with greater exposure. Additionally, increased bilingual engagement was associated with measurable gains in executive functioning and ToM abilities.

These findings suggest that structured bilingual education can reinforce cognitive development and language acquisition in high-IQ autistic children. The study highlights the value of multilingual curricula tailored to the cognitive strengths of autistic learners and supports further integration of language learning into inclusive education programs.

**Keywords:** autism spectrum, high IQ, bilingual, memory, skills

### 1. INTRODUCTION

Autism Spectrum Disorder (ASD) is often described in terms of challenges, but working closely with autistic children—especially those with high intellectual abilities—reveals a far more nuanced picture. These children, often referred to as “twice exceptional,” don’t just navigate the world differently; they also bring remarkable strengths to the learning process. In particular, many show a deep affinity for structure, pattern recognition, and rule-based thinking, which can become powerful tools when learning languages.

Bilingualism in autistic children has historically been misunderstood, with concerns over cognitive overload or linguistic confusion. However, growing research shows that bilingual autistic children do not experience delays in language development compared to monolingual peers, and in some domains may demonstrate advantages (Gonzalez-Barrero & Nadig, 2018; Beauchamp et al., 2023).

Structured exposure to French has been associated with improved narrative skills, working memory, and grammatical accuracy (Peristeri et al., 2021). While Albanian morphology—marked by complex case systems—can pose challenges for both typical and atypical learners, French morphology may better align with autistic learners’ preference for consistency and predictability.

Studies from Prévost & Tuller (2022) and Digard et al. (2020) also emphasize the social and executive function gains found in bilingual autistic individuals. Furthermore, narrative competence, often linked to both ToM and EF, tends to develop with targeted bilingual instruction, suggesting a potential benefit in structured foreign language acquisition.

In Albanian classrooms, especially in urban areas, French is commonly introduced from a young age. However, very little research has looked into how children on the autism spectrum, particularly those with high IQs, experience and process this kind of structured language learning. This question became the heart of our inquiry: could the regularity and predictability of the French language support language acquisition and even broader cognitive development in these learners?

What unfolded during this study was more than just a comparison between French and Albanian language skills—it became an exploration of how structured bilingual education can align with and support the unique cognitive styles of autistic students. The reflections and findings from this work point not only to educational strategies, but to deeper questions about how we can better understand and empower neurodiverse learners.

## 2. MATERIALS AND METHODS

In designing this study, we wanted to go beyond standardized testing and statistics. Our goal was to truly understand how high-IQ autistic children engage with language—both their native Albanian and the French they learn in school. We knew that numbers alone wouldn't capture the full story, so we built a methodology that was both structured and sensitive to the children's experiences.

We worked with thirty autistic children, aged between 9 and 15, all of whom had IQs of 130 or above. These students were enrolled in six public schools across Albania, where French is part of the mandatory curriculum. From the beginning, we were careful to ensure that every participant had at least a year of consistent exposure to French and met the criteria for ASD Level 1, according to DSM-5 guidelines. We also made sure there were no sensory impairments that could interfere with the tasks, as we wanted to focus clearly on language and cognition.

Over a six-week period, we met with each child twice for 90-minute sessions. These sessions were thoughtfully designed. We assessed vocabulary comprehension, morphological understanding, and phonological memory in both languages. We also included tasks that tapped into executive functions like working memory and inhibition, as well as both verbal and nonverbal Theory of Mind. One of our favorite parts was the narrative retelling activity—watching the children engage with stories gave us a glimpse into how they organize their thoughts and use language creatively.

To keep the process as fair and balanced as possible, we counterbalanced the testing order and were mindful of fatigue. Each response was recorded and later reviewed by bilingual coders to maintain accuracy. Throughout the process, we were struck by how much these students engaged with the tasks—especially when the structure of the activity matched their cognitive style. This method wasn't just a means to collect data; it became a way for us to connect with the students and see how language learning could empower them.

## 3. RESULTS

As we began analyzing the data, we were curious to see how the children's experiences with French and Albanian would compare—especially in vocabulary, grammar, memory, and cognitive functioning. What we found confirmed many of our hypotheses but also revealed some surprising patterns that deepened our understanding of how these twice-exceptional learners engage with language.

### Vocabulary Acquisition

We first looked at receptive vocabulary in both languages. Across all 30 participants, the mean score in Albanian was 85.4 (SD = 7.2), while in French it was slightly lower at 82.7 (SD = 8.1). A paired-sample t-test showed no statistically significant difference,  $t(29) = 1.58$ ,  $p = 0.123$ . To us, this was encouraging—it suggested that the children were acquiring French vocabulary at a rate comparable to their native language, especially considering that French was their second language.

When we broke it down by age, we noticed a clear developmental trend. Children aged 12 and above ( $n = 18$ ) had nearly identical scores in French ( $M = 86.1$ ,  $SD = 6.3$ ) and Albanian ( $M = 87.3$ ,  $SD = 5.9$ ). In contrast, younger participants (aged 9–11,  $n = 12$ ) had stronger vocabulary in Albanian ( $M = 82.5$ ,  $SD = 7.8$ ) than in French ( $M = 76.8$ ,  $SD = 8.5$ ), with a significant difference,  $t(11) = 2.43$ ,  $p = 0.034$ . It was rewarding to see that older children—those with longer exposure—were achieving almost full parity between the two languages.

### Morphological Processing

Here, the contrast between languages became more pronounced. The children performed much better in French morphology, scoring an average of 91.2% (SD = 5.4) on gender and number agreement tasks. In Albanian, however, their accuracy with case marking dropped to 73.8% (SD = 8.7). This difference was statistically significant,  $t(29) = 8.36$ ,  $p < 0.001$ .

We also observed a moderate negative correlation between age and Albanian morphological errors ( $r = -0.47$ ,  $p = 0.009$ ), meaning that older children made fewer errors. Interestingly, French morphology performance remained consistently high across all ages. We suspect this has to do with the predictability of French grammar—something that seems to align well with the cognitive strengths of autistic learners.

### Phonological Memory

Phonological memory was another area where we saw fascinating results. In nonword repetition tasks, children achieved mean accuracies of 79.5% (SD = 6.9) in Albanian and 81.1% (SD = 7.2) in French. The difference wasn't statistically significant,  $t(29) = -1.22$ ,  $p = 0.232$ . However, things changed when visual cues were added to the

French task—accuracy jumped to 86.3% (SD = 5.7), significantly outperforming the Albanian task without supports,  $t(29) = -4.11, p < 0.001$ .

This result reinforced something we noticed during the sessions: visual aids made a real difference. Many children responded better when tasks were multimodal, which may have reduced cognitive load and helped them focus on phonological patterns.

#### Executive Function

To measure executive function (EF), we created a composite score from working memory and inhibition tasks. Children who received more than 4 hours of French instruction weekly ( $n = 16$ ) scored significantly higher ( $M = 87.5, SD = 7.3$ ) than those with less exposure ( $n = 14, M = 79.6, SD = 8.5$ ),  $t(28) = 2.94, p = 0.006$ . We also found a strong positive correlation between weekly French hours and working memory scores ( $r = 0.52, p = 0.003$ ).

Inhibition tasks revealed that the high-exposure group made fewer errors ( $M = 5.2$ ) than the low-exposure group ( $M = 8.7$ ),  $t(28) = -3.18, p = 0.004$ . These findings strengthened our belief in the so-called "bilingual advantage"—not just in language learning, but in broader cognitive skills.

#### Theory of Mind (ToM)

One of the most striking findings came from the Theory of Mind assessments. On nonverbal ToM tasks, children performed better in the French context ( $M = 88.0\%, SD = 6.0$ ) than in the Albanian one ( $M = 81.5\%, SD = 7.8$ ),  $t(29) = 3.79, p = 0.001$ . Verbal ToM tasks didn't show significant differences between languages, but the nonverbal data gave us an important clue: exposure to a second language may be reinforcing implicit social reasoning abilities. We also found a positive correlation between ToM performance and the EF composite ( $r = 0.44, p = 0.014$ ), suggesting that these skills may grow together—something we hadn't expected, but found deeply meaningful.

#### Narrative Retelling

The storytelling tasks brought the results to life. French narratives included more subordinate clauses ( $M = 35.2\%, SD = 4.9$ ) compared to Albanian ( $M = 28.1\%, SD = 5.5$ ),  $t(29) = 5.44, p < 0.001$ . Cohesive devices such as conjunctions and pronouns were also used more frequently in French ( $M = 23.7$  per narrative) than in Albanian ( $M = 18.9$ ),  $t(29) = 4.05, p < 0.001$ .

Listening to these stories, we saw how structured language learning—particularly in a language like French—encouraged not only grammar development but also expressive richness and clarity. The emphasis on narrative structure in the French curriculum appeared to support these gains.

## 4. DISCUSSION

As we reflected on the results, what struck us most was the consistency with which structured bilingual education—especially in French—seemed to align with the cognitive strengths of high-IQ autistic children. These weren't just data points; they were reminders of how much potential exists when educational approaches are designed with neurodiversity in mind.

Our vocabulary findings showed that as the children grew older and spent more time exposed to French, their proficiency in that language nearly matched their native Albanian. This wasn't entirely surprising, but it was affirming. It demonstrated that bilingualism is not only possible for autistic learners—it's a path that becomes more natural over time when supported consistently. Seeing older participants bridge the vocabulary gap between their two languages confirmed that sustained instruction truly matters.

Morphological processing revealed something even more compelling. The children performed far better in French, a language with more regular grammatical patterns, than in Albanian, which features more complexity and irregularity—particularly in case marking. This strongly supported our initial assumption that the predictable structure of French could offer an advantage for autistic learners who often thrive in rule-based environments.

Phonological memory was another area where we learned something practical and important. The boost in performance with visual aids reminded us that language learning doesn't have to be auditory-only. When we paired tasks with visual cues—especially in French—the children's accuracy improved significantly. It was a simple change with a profound impact, and it reinforced our belief that multimodal learning should be more than an accommodation—it should be a standard part of instruction.

The most eye-opening findings, perhaps, were in the domains of executive function and Theory of Mind. Children who had more exposure to French (more than 4 hours weekly) not only performed better on working memory tasks, but also showed stronger inhibitory control. These cognitive improvements weren't just isolated language effects—they hinted at broader neurological benefits of bilingualism. It was especially moving to see that Theory of Mind performance was higher in the French context, particularly in nonverbal tasks. This raised new questions for us about how second language exposure might shape not just what children say, but how they think about others.

Our narrative analysis added another meaningful layer. The stories told in French were more complex, more cohesive, and structurally richer. This echoed what we had seen in the classroom: when autistic students are given

tools and structures that align with their cognitive style, they often go beyond expectations. The French curriculum's clear emphasis on narrative construction may have provided a scaffold these students could build upon—something Albanian, with its more implicit teaching style, may lack.

Throughout the study, we were aware of our limitations. The sample size was modest, and we didn't track long-term changes over time. We also couldn't control for differences in teaching quality or language exposure at home, which certainly played a role. However, despite these constraints, we were encouraged by the clarity of the patterns we observed.

Our work here isn't the final word—it's just a step toward a more inclusive, strengths-based approach to bilingual education for autistic children. What we've seen makes a strong case for moving past old fears about bilingualism and embracing the idea that when structured thoughtfully, language learning can be a powerful developmental tool—not just a communication skill.

## 5. CONCLUSIONS

As we brought this research to a close, we found ourselves reflecting not just on the data, but on the voices and experiences behind it—the thirty children who met us with curiosity, intelligence, and sometimes quiet determination. Through their participation, we saw that bilingual education is not only accessible to high-IQ autistic learners—it can be transformative.

We found that structured exposure to French helped these students reach levels of vocabulary and morphological understanding that often matched, or even surpassed, their performance in their native Albanian. This was especially true among the older students, and it confirmed what we suspected going in: time and consistency matter, especially when paired with instruction that is clear, explicit, and rule-based.

What surprised us most were the broader cognitive benefits. The gains in executive functioning—working memory, inhibition, and Theory of Mind—suggested that bilingualism may serve as a kind of cognitive training, supporting areas often seen as challenges in autism. We didn't expect narrative complexity to differ so clearly between languages, but the data—and the children's own stories—told us otherwise. With guidance and structure, they crafted richer, more cohesive narratives in French, a testament to the potential of curriculum to shape expression and thought.

This study leaves us hopeful and curious. We know the sample size was limited, and that many contextual variables—teaching quality, home environment, prior exposure—are difficult to isolate. But the strength of the patterns we observed makes one thing clear: when we align teaching strategies with cognitive profiles, especially in inclusive classrooms, everyone stands to benefit.

We hope this research encourages further exploration of bilingual education within autism studies—not as a risk to avoid, but as an opportunity to embrace. These children are not just capable; they are ready to thrive—when we meet them where they are and teach them in ways that make sense for how they think and learn.

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