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Autism and Bilingualism:

A Multimodal Analysis of Language Development and Unexpected
Bilingualism in Three Case Studies

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Abstract

In recent years the intersection between autism and bilingualism has gained more interest across the academic discourse. Nonetheless, limited attention has been given to the Italian context and to the phenomenon of unexpected bilingualism, that is, the spontaneous emergence of a language not present in the child's social environment. This study examines how three autistic children from migratory backgrounds experience this intersection in Italy. Through a semi-structured interview and questionnaire, the study first investigates the linguistic practices and beliefs reported by the children's families. Second, it explores how each of the children uses their languages during semi-structured play interactions, specifically examining the distribution of pragmatic functions and lexical categories across languages. Third, it examines to what extent these children's profiles present features associated with unexpected bilingualism.

By illustrating how these three children navigate their lives in a complex linguistic context, this work advocates for an approach that recognizes, respects, and supports the linguistic autonomy and preferences of autistic individuals.

Contents

Introduction.....	5
1. State of the art.....	10
1.1 Effect of bilingualism on young autistic individuals	10
1.2 Stakeholder and social perspectives	16
1.3 Language development	25
1.4 Unexpected bilingualism	32
1.4.1 Theoretical Perspectives and Implications of UB	37
2. Methodology.....	40
2.1 Participants and Sampling Procedure	40
2.2 Data Collection Tools.....	41
2.2.1 Semi-Structured Parental Interview	41
2.2.2 Multilingual Measurement: Adaptation of the M-BLUE	43
2.2.3 Video-recordings	44
2.3 Multimodal Annotation and Data Analysis	45
2.3.1 Use of generative AI tools	49
3. Case A.....	50
3.1 Clinical Background and Diagnostic Profile	50
3.2 Semi-Structured Parental Interview.....	51
3.3 M-BLUE assessment.....	53
3.4 Speech analysis	55
.....	59
3.5 Discussion	59
4. Case B	62
4.1 Clinical Background and Diagnostic Profile	62
4.2 Semi-Structured Parental Interview.....	63
4.3 M-BLUE assessment.....	66

4.4	Speech analysis	67
4.5	Discussion	72
5.	Case C	74
5.1	Clinical Background and Diagnostic Profile	74
5.2	Semi-Structured Parental Interview.....	75
5.3	M-BLUE assessment.....	77
5.4	Speech analysis	78
5.5	Discussion	83
6.	Discussion and limitations.....	86
6.1	General discussion	86
6.1.1	Stakeholder and social perspectives	86
6.1.2	Language development.....	87
6.1.3	Unexpected Bilingualism	90
6.2	Limitations and further directions	93
7.	Conclusion	95
	Bibliography.....	96

Introduction

In an increasingly globalized world, where international mobility is more accessible and digital media are deeply embedded in everyday life, bilingualism and media consumption have become common phenomena. Concurrently, digital devices provide access to continuous linguistic input, including exposure to languages not spoken within an individual's immediate social environment. While research on bilingual development and digital media exposure has expanded considerably in recent decades, these phenomena have predominantly been investigated in typically developing populations; leaving a significant gap in our understanding of how autistic individuals¹ and other neuroatypical communities interact with these complex linguistic and technological environments.

Autism Spectrum Disorder (ASD) is defined by the American Psychiatric Association (APA) as a neurodevelopmental condition characterized by persistent deficits in social communication and interaction, alongside restricted and repetitive patterns of behaviour, interests, or activities (Diagnostic and statistical manual of mental disorders 2013). Historically, autism research has predominantly operated within a medical deficit model, viewing autistic individuals strictly through the lens of impairment and framing developmental atypicalities merely as deficits. In contrast, emerging paradigms in developmental psychology and advocacy from the autistic community emphasize the intrinsic value of studying autistic development in its own right, not merely as a deviation from neurotypical norms, but as a valid and unique developmental trajectory that merits dedicated investigation (Digard et al. 2023; Leung and Molnar 2025).

The present study seeks to investigate autistic children within the context of bilingualism and digital media exposure. Bilingualism, broadly defined as the regular use of two or more languages, is a lived reality for a vast portion of the global population. Yet relatively little is known about the linguistic development and lived experiences of bilingual autistic individuals. Within this domain, a

¹In line with the preferred usage of many individuals from the autistic community, throughout the article I use “autistic individual (or child)” (Dwyer et al. 2022).

particularly intriguing phenomenon is that of Unexpected Bilingualism (UB). While early literature often restricted discussions of exceptional linguistic abilities in autism to "savant" profiles, individuals presenting an atypical cognitive profile with overall functioning below statistical norms alongside hyper-specialized skills, the term Unexpected Bilingualism specifically describes a person who acquires a second language, that is not present in their immediate social context (Dumont et al. 2025; Gagnon, Ostrolenk, and Mottron 2025; Zhukova et al. 2023).

Interestingly, emerging evidence suggests that unexpected bilinguals frequently acquire language through exposure to digital devices, such as cartoons and online media content. While traditional literature on neurotypical development frequently highlights the potential drawbacks of early screen exposure on language acquisition (Kuhl, Tsao, and Liu 2003), autistic children appear to exhibit a unique capacity to acquire and process linguistic input through media content. This phenomenon challenges conventional models of language acquisition and raises crucial theoretical questions regarding language learning (Kissine 2021).

Despite growing interest, the existing literature on bilingualism in autism presents notable limitations. Most studies concentrate on verbal children who can complete structured, standardized language assessments, leaving minimally verbal children or those whose cognitive profiles prevent participation in formal testing largely underrepresented. Furthermore, research has primarily focused on deficit-based metrics, such as determining whether bilingualism negatively impacts vocabulary, morphosyntax, or semantic acquisition, rather than exploring naturalistic, ecological language use in real-world settings. Finally, to the best of the author's knowledge, there is a distinct lack of empirical data regarding unexpected bilingualism within the Italian context.

To address these gaps, this master's thesis presents an in-depth investigation of three autistic children raised in multilingual households by immigrant parents with minority language backgrounds. Specifically, the study pursues three aims. First, it investigates the linguistic practices and beliefs reported by the three

families, including parental perceptions of professional guidance regarding language choices. Second, it explores how each of the three children uses their languages during semi-structured play interactions, specifically examining the distribution of pragmatic functions and lexical categories across languages. Third, it examines to what extent these children's profiles present features associated with unexpected bilingualism. The present study adopts a multi-methodological approach to capture the full complexity of their linguistic profiles. The children's language history, family linguistic context, and parental attitudes were explored using a semi-structured interview, while quantitative exposure to different languages was assessed using the M-BLUE questionnaire (Multilingual Families Lab Tools 2018). Additionally, video recordings of therapy sessions were collected for each participant to analyse spontaneous language production within a semi-naturalistic play environment. A central focus of this analysis is evaluating how language choice intersects with communicative functions in ecological contexts, examining which languages are deployed and for what purposes during play.

This semi-naturalistic approach aims to provide an accurate description of the child's authentic linguistic competence. Ultimately, this study reinforces the necessity of researching autistic children as children, respecting their distinct developmental trajectories without constantly measuring them against neurotypical standards. By illustrating how these three children navigate their lives at the intersection of a dominant societal language, a family heritage language, and unique media-derived linguistic interests, this work advocates for an approach that recognizes, respects, and supports the linguistic autonomy and preferences of autistic individuals.

The thesis is structured as follows. First, it presents a state-of-the-art review of bilingualism in autism. The review begins by addressing some of the main misconceptions surrounding bilingual exposure in autistic children and examines the evidence concerning its effects on language, cognitive, communicative, and socio-emotional development.

Then, the linguistic characteristics of bilingual development in autism are discussed. This chapter considers the language domains most frequently investigated in previous research and discusses what is currently known about autistic bilingual children's linguistic performance. It subsequently focuses on the perspectives and experiences of families, educators, clinicians, and autistic individuals. Particular attention is given to the complexity of family language choices and to the personal, and social factors that influence decisions concerning bilingual education.

Finally, the thesis addresses Unexpected Bilingualism as an emerging area of research concerning the acquisition of an additional language despite limited or absent direct interaction in that language. The discussion of UB raises broader questions about atypical language development, the diversity of developmental trajectories, and the relationship between autistic children, mediated linguistic input, and digital media. These issues provide the conceptual background for the empirical study presented in the following chapters.

Following the state-of-the-art review, the empirical study is presented. The objective of this section is to present the research, closely analysing the communicative and linguistic profiles of three autistic children exposed to multilingual environments. Through a multimodal, qualitative-quantitative approach, this study aims to investigate how the participants' linguistic repertoire is concretely expressed in daily interaction, pragmatics, and vocabulary. The methodology and research design are first described, together with the data-collection procedures and analysis, describing in detail the tools employed. The three case studies are then presented individually. Each case follows the same structure: first, the child's personal, developmental, and clinical background is introduced; then, the findings from the semi-structured parental interview and the M-BLUE questionnaire are presented. The video-recorded session is then described, including a brief account of the activities and interactional context in which the recording took place. The results of the pragmatic and lexical analyses

are subsequently presented, followed by a brief discussion of the linguistic and sociolinguistic patterns emerging from each case.

After the three individual cases, a general discussion brings together the findings across participants. The results are interpreted in relation to the existing literature on bilingualism and autism, with particular attention to bilingual language development, unexpected bilingualism, and the role of the sociolinguistic environment. The thesis concludes with a discussion of the main strengths and limitations of the study, followed by the final conclusions.

1. State of the art

Bilingualism and multilingualism are now common phenomena; although the exact percentage is not known, current estimates suggest that between half and two-thirds of the world's population use two or more languages in their daily life (unesco.org s.d.).

Over the years, the scientific community has produced a great number of studies focusing on second language acquisition, different types of bilingualism, and the possible positive outcomes of being bilingual. Notably, in the last decades, an increasing number of studies have started to address the intersection between bilingualism and autism. To provide a contextualised representation of the subject, this chapter is divided in four sections, offering a critic insight into the current state of the art.

1.1 Effect of bilingualism on young autistic individuals

One of the main misconceptions about bilingualism is that it might cause confusion in young children. Although this misconception persists even with regard to typically developing children, the level of resistance to bilingualism remains significantly high when assessing young autistic individuals (Drysdale, van der Meer, and Kagohara 2015; K. Howard, Gibson, and Katsos 2021; Lim et al. 2025; Yu 2013).

Notably, this belief does not find any evidence in literature. However, it is necessary to highlight that research on bilingualism and autism have only recently begun to gain ground in the scientific field. As shown by Garrido et al. (2024) in their systematic review, six out of twelve articles, analysed in their study, were published between 2019 and 2020.

By 2015, the lack of research specific to bilingualism in autistic children led professionals to struggle in developing informed language recommendations for these children. As a result, families often did not know where to seek information on bilingualism for their children (Drysdale, van der Meer, and Kagohara 2015).

To better assess the existent literature on bilingualism in autistic children, Drysdale et al. (2015) conducted a systematic review, including eight studies published by February 2014. The findings were classified by focus of study. Four articles compared the language skills of monolingual and bilingual autistic children, one study focused on bilingual language intervention, the last three studies investigated issues surrounding bilingualism and autism. The authors conclude that, while it might seem counterintuitive to encourage bilingualism if children are struggling to learn one language, the research reviewed consistently indicates that autistic bilingual learners are not at a greater disadvantage for language learning than monolingual children.

A more recent systematic review by Garrido et al. (2024) takes in to account 12 studies published in English or Spanish during the period from 2015 to September 2020. All the studies addressed language in autistic children older than 3 years, raised in a bilingual environment, and included comparison groups. Results indicate a common consensus that bilingualism is not detrimental to language development in autistic children. It is worth noting, though, that the age of participant and the language domain assessed may have an effect (Garrido, López, and Carballo 2024). It seems that differences in language outcomes appear after the age of 6. As for the language domain, studies have confronted bilingual autistic children and their monolingual autistic and bilingual typically developing peers. Inconclusive results were found for receptive vocabulary, verbal working memory, and verbal fluency; while differences between autistic children and the other groups were identified for morphological and syntactic skills, spelling, narrative coherence, production of third-person pronouns, and social communication skills. In accordance to previous reviews, Garrido et al. (2024) conclude that simultaneous language development has no negative effect for autistic children, nonetheless it is important to take into account that the great heterogeneity observed in the areas of language studied could hinder the possibility to draw generalisable conclusions within language domains. A more

in-depth analysis of the language trajectories will be offered in the third section of this chapter.

The ongoing need to offer positive insights within the field of bilingualism in autism is highlighted by a recent study conducted by Phillips et al. (2024). The study aimed to explore the effects of bilingual language exposure on language development, cognitive development, and social–emotional development in autistic children, with particular attention to the influence of age. The participants included autistic and typically developing children, divided into two sub-groups: children younger than 24 month, and children aged 24 month or older. Each child was evaluated using the Bayley scales of infant development-third edition (Bayley-III), and the Childhood autism rating scales-second edition (CARS-2). The results did not show any impact of bilingualism in either language, nor cognitive and social emotional domains. The authors conclude that bilingualism does not further delay language acquisition in children with ASD or disrupt cognitive or social–emotional development. Hence, bilingual parents should be encouraged to raise their autistic children as bilinguals.

Alongside studies assessing whether bilingualism may have detrimental effects on language development, other studies focused on the effects of bilingualism on broader communication abilities, cognition and executive functions.

In a 2026 longitudinal study, Kara et al. assessed symptom severity during early childhood in autistic children. The authors compared CARS scores, indicative of greater symptom severity, between 34 children with bilingual home situations (BHSs) and 35 children with monolingual home situations (MHSs), over a 3-year-follow-up period. Consistent with previous literature, the authors did not find any marked differences in terms of language development-acquisition in autistic children with bilingual home situation. Nonetheless, the study presents an important finding that challenges the prevailing literature. Indeed, CARS scores decreased significantly less in the BHS group compared to the MHS group; hence symptoms associated with autism persisted more in the BHS group. The authors

argued that bilingualism itself did not constitute an advantage for the decrease in symptoms severity; furthermore, the presence of BHS in autistic children may be associated with less improvement in ASD symptoms over time. It is important to note that, despite the mother's education level was covaried in the statistical analysis of the study results, group and time interaction effect was significant even when maternal education was controlled. Certainly, the authors made an effort to exclude effects other than BHS; nonetheless, as stated by themselves, bilingualism may influence autistic children through a variety of factors, including social interaction, access to education, and racial characteristics (Kara et al. 2026).

Similarly, Peristeri, Silleresi, and Tsimpli (2022) compared the intelligence profiles of 146 autistic bilingual individuals and 170 age- and gender-matched monolingual autistic children. Verbal and nonverbal IQ performance were assessed using the Wechsler Intelligence Scales for Children-Third Edition. Moreover, the IQ performances were modelled as a function of language experience, socio economic status (operationalized as mother's years of education), and age. Results suggest that socio economic status, mediated by bilingualism, is related to autistic children's intelligence, with low-socioeconomic status bilingual autistic children (low-SES) exhibiting better performance than their monolingual peers. These findings offer support that bilingualism has a beneficial effect on low-SES autistic children's intellectual functioning. Crucially, the authors argue that the benefit of bilingualism in the intelligence of autistic individuals is not a discrete "all-or-nothing" process that only requires exposure to another language but rather relies on a complex balance of bilingual experience and SES. Hence, familial and sociocultural factors should be addressed in order to support the cognitive development of autistic children (Peristeri, Silleresi, and Tsimpli 2022).

Despite growing evidence that bilingualism and multilingualism do not have a negative impact on autistic children, only few studies have focused on the impact of second language exposure in autistic children who presents intellectual

disability or are nonverbal, minimally verbal, or used AAC. A recent study, conducted by Hutchison et al. (2025), explores the impact of second language exposure and intellectual disability status on executive function and functional communication outcomes. The aim to include autistic children with intellectual disability is a unique feature of this study as these individuals are typically excluded from research. The results suggest that second language exposure do not seem to have a negative impact on functional communication skills and executive function in autistic children; these findings are consistent even in the case of a coexisting intellectual disability. Although presented with a small sample, i.e., only 18 autistic children with an intellectual disability, these preliminary findings are important to reassure all the families worried about raising their children as bilinguals. The authors also add that for autistic children without intellectual disability, second language exposure in the home or school may be associated with positive impact on everyday executive functions (EF).

Despite being frequently addressed in bilingual research, evidence regarding a potential bilingual advantage in executive functions remains mixed. A study conducted by Sharaan, Fletcher-Watson, and MacPherson (2021) aims to investigate the impact of bilingualism in autistic and typically developing children (TD), on a specific set of EF skills, namely interference control, flexible switching, sustained attention and working memory. Results indicate that bilingualism did not positively influence executive functions in either autistic or TD children; the authors conclude that, according to previous studies, bilingualism does not negatively impact the executive functions of autistic children.

Complementing these findings, Sharaan, MacPherson, and Fletcher-Watson (2022) design a second study to capture executive behaviours in real-world contexts through parent and teacher rating scales. Their results indicated that dual-language exposure does not have a negative impact on EF. Moreover, although through parent ratings only, they found a positive effect for bilingual autistic children relative to their monolingual peers across all EF domains. In

general, authors conclude that bilingualism might mitigate daily executive challenges in autistic children.

Finally, Peristeri et al. (2020) evaluated narrative performance and executive functions, specifically working memory and visual selective attention, in autistic and neurotypical children. Their findings revealed that bilingual autistic participants outperformed their monolingual autistic peers in macrostructural narrative complexity and microstructural precision. More crucially, bilingual autistic children were also found to display enhanced visual attention, working memory, monitoring and updating skills. The authors conclude that bilingualism can mitigate processing weaknesses displayed by some autistic individuals in both EF and narratives.

While all of these studies are certainly important to better understand how bilingualism and autism intersect, Digard and colleagues (2023) raise an important issue by advising researchers to be careful in how they design their study and communicate their findings. Indeed, attempts to present bilingualism as an exceptional experience can be particularly problematic when it comes to investigating bilingualism, autism, and cognition. In a space dominated by monolingualism centred expectations, approaching bilingualism exploration with reference to monolinguals and identifying possible cognitive advantages could be seen as another way of attempting to justify the value of bilingualism. On the contrary, the authors argue that the bilingual experience has its own value, regardless of possible cognitive advantages that it may offer. Furthermore, Digard and colleagues note that the research for a bilingual cognitive advantage in autism can also contribute to reinforcing stigmas about autism. For instance, it might lead to the assumption that bilingualism is good for autistic individuals because its effect might mitigate certain difficulties in autism. This can exacerbate the conviction that autism automatically equates to deficits and that, therefore, *“bilingualism is there to save the day”* (Digard et al. 2023). The authors invite academics to move away from problematic designs and to conduct respectful

research that can contribute to reduce stigmas towards autistic bilingual experience.

Overall, the present literature consistently demonstrates that bilingualism does not exacerbate linguistic delays, cognitive impairment or socio-emotional wellbeing of young autistic individuals. Few research underscores that bilingualism can yield specific cognitive benefits; although, it is important to note that individual heterogeneity, environmental factors, and socio-economic status must be accounted for. Most importantly, it is necessary to present these findings with caution and not framing bilingualism purely through the lens of a "cognitive advantage", as this behaviour is at risk of reinforcing deficit-based views of autism; instead, exposure to multiple languages should be recognized as a fundamental socio-cultural right and a valuable communicative tool in its own right.

1.2 Stakeholder and social perspectives

Despite the fact that the evidence does not present any argument against bilingualism education in autistic children, the exposure of young autistic individuals to multiple languages is still a major concern among families and service providers.

Lim et al. (2025) conducted a systematic review exploring experiences and perceptions of bilingualism across autistic individuals, their families, and service providers. 28 qualitative studies were identified, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The review revealed a shared consensus across all participants regarding the diverse benefits of bilingualism. Stakeholders consistently emphasized that maintaining a home or heritage language fosters cognitive, social, and emotional development. Importantly, autistic individuals perceived bilingualism as enriching their lives, helping them feeling more connected to their family and broader community. Participants from different categories (parents, autistic individuals

and service providers) highlighted the role of bilingualism in preserving cultural identity, family cohesion, and community inclusion.

However, despite service providers recognized benefits of bilingualism, they expressed concerns about the potential challenges bilingualism might pose for autistic children with significant cognitive or language impairments, suggesting that a monolingual approach could help reduce confusion and frustration. Indeed, a significant number of parents reported being actively advised by professionals to adopt a monolingual approach. Parents also felt pressures from society to further encouraged the prioritization of the dominant language for better access to education, employment, and support services. Consequently, parents often perceive language decision-making as a complex and stressful process.

Finally, Lim et al. (2025) argue that while service providers are gradually shifting toward acceptance, challenges such as limited bilingual resources, inconsistent language exposure across settings, and difficulties in assessing bilingual children often hindered service delivery. The authors underscore the urgent necessity for culturally and linguistically responsive practices, calling for improved professional training to align clinical guidance with empirical evidence and to support families in preserving their heritage language.

Indeed, professional and educational advice is one of the many factors influencing language decision about maintaining bilingualism in autism (K. Howard, Gibson, and Katsos 2021). Therefore, examining the perspectives and attitudes of clinicians, teachers, and educators is crucial to obtain a comprehensive understanding of parental decision-making regarding bilingual education for their children.

Howard, Katsos, and Gibson (2020), conducted a research aiming to better understand the perspectives and experiences of educational practitioners who provide support for autistic bilingual learners. The study was set in two linguistically different educational settings: England and Wales. Participants were interviewed in a semi-structured setting and included a total of 13 practitioners working in mainstream schools: 5 teachers, 4 teaching assistants, 3 special

educational needs coordinators and 1 speech and language therapist. Results revealed a more positive attitude toward bilingualism among the Welsh practitioners, who were bilingual themselves. However, overall practitioners' perspectives toward bilingualism in autistic children were varied and no consensus was reached about whether bilingualism helped or hindered students' development. Educators highlighted some key advantages of bilingualism, although most of these applied to typically developing children, rather than being specific to autistic students. Crucially, the authors emphasize the need to raise awareness in schools and providing educators with more training on autism and bilingualism.

A relevant contribution to understanding professional perspectives on multilingualism in autism is provided by Martin Loya and Meadan (2024). Utilizing reflexive thematic analysis, the authors explored the experiences of bilingual providers, specifically applied behaviour analysts (ABA), delivering intervention services to bilingual autistic children in the United States.

The findings revealed that bilingual providers view heritage language care as essential for better outcomes; indeed, the participant shared the view of bilingualism as an important aspect of culture and identity. Notably, providers reported that supporting the child's native or home language enhances communicative engagement and strengthens family relationships. Conversely, the absence of shared-language care was associated with significant barriers, including systemic communicative breakdowns between clinicians, autistic children, and their caregivers.

Interestingly, the participants all showed concerns for advancing social justice, expressing the will to bridge the gap created by a lack of institutional support and widespread professional misconceptions. The authors conclude highlighting the potential positive impacts on children when receiving linguistically and culturally appropriate care.

Furthermore, Davis, Zaki, and Sargent (2024) contribute to the discussion by directly addressing the perspectives of speech and language therapists (SLTs).

The authors conducted a semi-structured interview, collecting perspectives and experiences of 12 SLTs working with bilingual autistic children in UK. Data were analysed following a reflexive thematic analysis, results were categorised into three themes. First, professional experience with parents yielded an accurate picture of parental concerns around bilingualism and autism; parents are concerned about confusing their child by using more than one language; at the same time, they are worried that their low fluency in the dominant language will be harmful for their child's language development. Secondly, when assessing the decision-making process for SLTs, most of them expressed their support in maintaining a bilingual environment; although, the majority of SLTs identified a lack of dedicated time for studying the topic, due to their busy schedule. Lastly, the participants highlighted the importance of considering cultural and religious factors when meeting families, expressing a need to shift focus to culture and inclusion. Crucially, several SLTs raised concerns that current clinical tools are not always inclusive or relevant for all children; additionally, professionals stressed the limited options for resources and interventions available in other languages, alongside with overlapping concerns relating to the use of interpreters.

In contrast with these findings, where speech and language therapists tended to encourage multilingual approaches in autism, Howard and colleagues (2024) found that educators were more likely to have concerns about the feasibility of bilingualism in autism; although, some educators argued that in the right conditions and with the right support, it was possible for an autistic child to develop more than one language. The study synthesises the findings of three qualitative studies that explore the perspectives and experiences of bilingual autistic children ($n = 11$), parents ($n = 16$), and educational practitioners ($n = 13$) of bilingualism in autism in England and Wales.

Several parents were in line with educators' perspective and noted that language decisions should be made based on the extent to which the child could communicate their basic needs. Moreover, parents who opted for a bilingual education reported that they used their own language with their child because it

came more naturally, while others chose a more monolingual approach because using two languages was less natural to the child. Some participants also express the idea that, while bilingual development was possible for autistic children, in certain cases, it might take longer than for non-autistic children.

Crucially parents who opted for a more monolingual approach reported some negative effects on well-being, for the child and for parents and siblings. Some parents described their guilt or sadness at not being able to share their language with their child. Families who opted for a more multilingual approach tended to report more positive experiences related to wellbeing, as children were able to maintain communication with family members. Notably, both parents and children highlighted that being able to speak the home language was essential for relationships with the immediate and extended family. Although limited to children who exhibit language proficiency and confined to a specific geographical area, this study reveals that bilingualism in autistic children may posit feasibility challenges due to a variety of factors including a scarcity of clear guidelines for clinicians and educators and a lack of bilingual services in the educational and clinical settings. More importantly, these structural barriers are forcing bilingual family to make the difficult choice of prioritising the majority language, at the expense of the heritage language and family connection.

The lack of adequate bilingual services emerges clearly from all the cited articles. Crucially, this issue is well documented in a systematic review conducted by Lim et al. (2019). The study had the purpose to evaluate researches focusing on the effects of incorporating heritage languages into interventions for individuals with neurodevelopmental disorders, including autism. The review further highlighted that autistic children were less likely to receive educational support in their heritage languages; the authors argue that this may be linked to the comorbidity rates of autism and impaired intellectual and adaptive functioning. Similarly, Hampton et al. (2017) found that concerns regarding bilingual education were particularly common for parents of autistic children with lower verbal ability. Additionally, Drysdale, van der Meer, e Kagohara (2015) noted that

within the 8 studies analysed in their systematic review, children who were nonverbal, minimally verbal, or used AAC as a predominant means of communication were less represented. This calls for more inclusive research, which systematically accounts for non-verbal and minimally verbal profiles.

Beyond child-related factors such as verbal ability and communicative profiles, parental language choices are shaped by a diverse number of variables. Howard and colleagues (K. Howard, Gibson, and Katsos 2021) highlight a common list of factors involved in parental language decision. Among professional advice, already mentioned before, critical aspects comprise communication with family, feasibility of bilingualism and the importance of the dominant societal language. Interestingly, Howard et al. (2021) found that despite positive attitudes on bilingualism displayed by the families, these views were not always congruent with their language practices. Indeed, the choice of raising bilingual autistic children is not always a matter of ideal, rather necessity (Hampton et al. 2017).

To gain a clearer insight into how families navigate language choices in their daily lives, Yu (2016) examined the contrast between *bilingualism as conceptualized* and *bilingualism as lived*. The author conducted an ethnographic and discourse analytic case study. The subject of the study was a minority-language family of a six-year-old autistic child. The in-depth analysis revealed the discrepancy between parents' intentions to adhere to the professional advice of monolingualism and the reality of everyday home interactions. The family comprised 5 members, including the autistic child. Under societal and service providers, the family adopted for a monolingual language policy with the child. Despite their will, they continue speaking their heritage language, Mandarin-Chinese, among other family members; consequently, even when the child was not being directly addressed, he was continually immersed in a bilingual context. Language hybridity, characteristic of the family language practice, defies the sort of rigidity that the advice to speak English was meant to impose. Crucially, the author argues that:

“The findings suggest that instead of being given advice, families need to be understood, informed, and encouraged to arrive at dynamic ways of speaking among family members that are self-enhancing and that can adapt flexibly to their changing needs over time and across contexts.”

Additionally, the author highlights that the child's participation in conversations was better predicted by contextual salience and moment-by-moment interactional supports, than whether his family members spoke to him in English or Chinese. Finally, Yu emphasises the need to assess bilingual family interactions as an interactional achievement, inviting researchers to explore bilingualism as a lived experience. According with this view, a previous study by Jegatheesan (2011) highlights how parents interpret their children's language development and ability through a cultural lens, which is different from the lens used by most professionals.

Similarly, Kremer-Sadlik (2005), in reporting the testimony of different parents, highlight that raising their autistic child as monolinguals resulted, at least in some cases, in miscommunication, mistakes with translation, and resulting frustration. More alarming, some of the children were left out of family conversations held in the family heritage language(s), as in the case of Yu's (2016) reported case.

(Franco and Costa 2025) conducted a study investigating how parent language use is linked to the social skills of 68 autistic children and to their parents' ability to feel comfortable, authentic, and free to express themselves. Results showed that children's social skills do not seem to be related to the language(s) used by parents when interacting with their children; however, no significant advantage of multilingualism were found. The authors interpret these data as additional evidence that multilingualism does not have a negative impact on children's development. Crucially, the analysis on language use and parents' perceptions suggest that parents feel the most comfortable, authentic, and able to express themselves freely when using their mother language and/or being proficient in the language that they use with their child. Moreover, the authors warn that if the heritage language is to be dismissed, parents' cultural identity,

songs, or stories that cannot be translated, might not be passed on to their children.

This issue is especially critical when addressing families from a minority-language background. As discussed in Yu (2013), in these contexts, decisions regarding heritage language maintenance are deeply intertwined with social, cultural, and practical dynamics. While immigrant parents strongly desire to preserve their home language to foster family intimacy and retain generational connections, they often abandon these efforts if they perceive dual-language exposure as a barrier to English proficiency. These worries are further compounded when a child receives an autism diagnosis. Yu (2013) reported that parents are frequently advised to adopt English exclusively to avoid potential developmental delay. As a result, minority-language caregivers feel pressured to abandon their primary language during intervention, even when enforcing monolingual English at home hinders natural family communication and cultural transmission.

Expanding the geographical scope, similar parental experiences and challenges emerge from a study conducted in India, by Rasheed, Tiwari, and Padickaparambil (2025). The study aimed to explore the parental views on language choice and their impact on bilingual families of autistic children. Their findings reveal a significant discrepancy between parental beliefs and their actual language practices. While parents generally express positive attitudes toward bilingualism, recognizing its intrinsic value for identity and family cohesion, they often demonstrate a mismatch between the opinion on language choice and practice. Decisions to limit or discontinue the home language are driven by a complex interplay of factors, including the perceived severity of the child's communication difficulties, the dominant role of English in educational settings, and, crucially, directive advice from healthcare professionals and speech therapists. The authors emphasize that restricting family interactions to a single, non-native language places a heavy burden on domestic dynamics, affecting not

only the emotional well-being of the family but also the overall effectiveness of therapy and education.

Finally, it is important to address adult autistic individuals who can provide a better insight in the experiences of bilingualism in autism. Through a cross-sectional survey, Nolte et al. (2021) explore the demographic, language, and social profiles of autistic bilingual and multilingual adults, as well as their lived experiences. Data analysis highlights the numerous ways in which autism and multilingualism can influence one another. Predisposition for language learning, family and romantic relationships, academic and employment opportunities were some of the key factors fostering motivation within autistic individuals. Respondent declared a diverse number of benefits, including gains in self-efficacy, creating new social networks, and opportunities for travel and leisure. Participants also mentioned benefits in other areas that are relevant to broader issues that affect autistic people, such as better employment prospects and an increased confidence and joy stemming from multilingualism. Finally, the authors argue that:

“one multilingualism benefit unique to the autistic population is the increased opportunity to interact with the worldwide autistic community, and to access more information about autism, thus empowering autistic multilinguals who may otherwise feel isolated.”

In summary, while an increasing body of empirical research confirms that multilingual exposure poses no threat to the cognitive, linguistic, or social development of autistic children, a significant disconnect persists between scientific evidence and everyday clinical and educational practice. Across diverse geographical and cultural settings, ranging from the UK and the US to India, different service providers continue to display cautious or sceptical attitudes.

Crucially, the literature indicates that forcing minority-language families to abandon their home language may entail severe socio-emotional consequences. As highlighted by qualitative studies, systematic reviews, and the first-hand accounts of autistic adults, heritage language maintenance is not merely a

linguistic choice, but a vital foundation for family cohesion, emotional authenticity, cultural identity, and well-being. Thus, the need for a shift to culturally and linguistically responsive models of care; recognizing multilingualism not as a potential burden, but as a lived experience and a valuable resource for autistic individuals and their families.

1.3 Language development

A systematic review conducted by Gilhuber, Raulston, and Galley (2023) examined the effects of multilingualism on the language and communication skills of autistic children. Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, the authors identified 22 peer-reviewed group-comparison studies published between 2011 and 2022. Their review addressed two main questions: first, which language and communication skills had been assessed in multilingual autistic children and through which instruments; and second, how these children performed in comparison with their peers.

The studies included in the review examined a wide range of linguistic dimensions and communicative skills. Semantic abilities, particularly vocabulary, were the most frequently investigated. Syntactic skills, including sentence repetition, were assessed in eight studies, whereas seven studies examined morphological abilities. Pragmatic-related skills were addressed in four studies, while only two studies reported findings concerning phonological abilities. This distribution suggests that the literature has devoted considerably more attention to vocabulary and grammatical development than to phonology, prosody, and other aspects of speech production. Crucially, these often-overlooked aspects need to be further studied.

Recently, Beccaria, Gagliardi, e Kissine (2025) investigated the perception of autistic children's accents and reported that listeners often judged these accents as lacking the regional features associated with the children's communities.

Instead, the accents were perceived as resembling more standard varieties, such as those commonly heard in cartoons and children's television programmes. As a result, autistic speakers may sometimes be perceived as having a "foreign" or "posh" accent. Indeed, research on phonology and prosody suggests that the speech of some autistic children may differ from the speech patterns characteristic of their surrounding linguistic communities. The authors propose that this pattern may be partly related to the influence of screen media on language development. Early speech in autistic children is frequently characterised by echolalic productions, namely immediate or delayed repetitions of linguistic sequences. These repetitions may preserve detailed phonetic and prosodic properties of the original input. The linguistic material reproduced by children may derive from expressions used by caregivers, but also from songs, online videos, cartoons, or other media content to which the child is repeatedly exposed. Consequently, although some autistic children's speech may closely reflect the language used by their primary caregivers, in other cases repeated exposure to screen-based material may constitute an important source of phonetic and prosodic input. Beccaria et al. (2025) therefore suggest that the speech of some autistic children may be shaped by mediated exposure to standard varieties rather than by the dialectal features of their immediate community. However, the authors also acknowledge that other explanations are possible. For instance, the preference for a standard accent may be related to a more formal communicative style, which has sometimes been associated with the description of autistic language as "pedantic". Such communication style may also be reinforced by an interest in written language. Screen exposure should therefore be understood as one possible influence among several, rather than as a sufficient explanation for atypical accent patterns.

Prosody has also been investigated in relation to bilingual autistic children who acquire a tonal language. Chen et al. (2025) examined the production of speech prosody in autistic children learning a non-native tonal language. The study focused on the use of acoustic cues for lexical tone and focus marking, comparing

autistic children with typically developing peers. The findings indicated that the autistic participants used fewer acoustic cues and produced less prominent expansion of these cues on focused constituents, particularly in comparison with native Mandarin-speaking children. They also showed a preference for expanding focus-related cues rather than compressing post-focus material. At the same time, the autistic children, together with their native Cantonese-speaking peers, showed particularly accurate realisation of lexical tones. This may indicate that they prioritised lexical prosody over the prosodic marking of information structure. Such prioritisation may have limited their use of prosodic cues for focus marking. Nevertheless, the difficulties observed in the acquisition of prosody in the non-native tonal language were not greater than those found in the children's first language. Chen et al. (2025) conclude that multilingual exposure may support the acquisition of some focus-marking strategies, although autistic children may still require explicit support to use these strategies consistently in both their native and additional languages.

Taken together, these studies indicate that phonological and prosodic development in multilingual autistic children may be influenced by the interaction between perceptual sensitivity, the nature of the linguistic input, and the communicative context in which that input is encountered. They also highlight the need to distinguish between segmental phonology, prosody, and the social-pragmatic functions associated with speech patterns.

Morphological and syntactic abilities have received more systematic attention than phonological and prosodic skills. Gonzalez-Barrero e Nadig (2019) compared the lexical and grammatical abilities of 13 monolingual and 13 bilingual school-age autistic children without intellectual disability. Morphological skills were assessed through the Word Structure subtest of the CELF in the relevant language versions. The task required children to apply grammatical rules involving pronouns, verb inflections, and derivational morphology. The bilingual autistic children performed slightly below the average range on the standardised morphological task in their dominant language. However, this result should not

be interpreted as evidence that bilingualism itself causes morphological difficulties. The study involved a relatively small sample, and the children's language experience and proficiency may have varied considerably across participants.

In a related study, Gonzalez-Barrero and Nadig (2018) examined the influence of current language exposure, nonverbal IQ, age, and working memory on vocabulary and morphological abilities. Amount of current language exposure was the strongest predictor of both vocabulary and morphology. It accounted for 62% of the variance in vocabulary scores and 49% of the variance in morphological scores across both autistic and typically developing children. These findings highlight the central role of language exposure in linguistic development and suggest that the amount and distribution of input may be more informative than bilingual status considered as a categorical variable.

Pronoun interpretation has also been directly examined in bilingual autistic children. Skrimpa et al. (2022) investigated the resolution of ambiguous pronouns in four groups: bilingual and monolingual autistic children and bilingual and monolingual typically developing children. Participants completed an online listening sentence–picture verification task in which they judged whether an acoustically presented sentence was compatible with a visual scene. The results showed that autistic children generally experienced difficulty anchoring ambiguous pronouns to entities previously introduced in discourse. However, bilingual autistic children were more sensitive to the topicality of entities in syntactic subject position and were more likely than their monolingual autistic peers to identify these entities as suitable referents for ambiguous null pronouns. The authors conclude that these findings suggest that bilingualism did not have a detrimental effect on pronoun-resolution skills and may have been associated with greater sensitivity to discourse-related information in this task.

As mentioned before, vocabulary has been one of the most frequently investigated aspects of language development in multilingual autistic children. The studies by Gonzalez-Barrero and Nadig (2018, 2019) indicate that amount

of language exposure is a particularly important predictor of vocabulary development. In the 2019 study, bilingual autistic children performed within the average monolingual range on the Peabody Picture Vocabulary Test in the relevant language versions. This finding suggests that bilingual children's performance should be interpreted in relation to the amount of exposure received in each language rather than through a direct comparison between bilingual and monolingual status.

Hambly e Fombonne (2014) examined the relationship between bilingual exposure, social impairment, cognitive abilities, and expressive vocabulary in a second language. Second-language expressive vocabulary was measured using the MacArthur–Bates Communicative Development Inventories. The authors hypothesised that vocabulary size in the second language would be related to the amount of direct exposure to that language and to the children's expressive abilities in their dominant language. The results indicated that social impairment did not differ significantly between the groups and that cognitive impairment did not prevent the development of a second-language vocabulary. Indeed, some autistic children with measured cognitive impairments were able to acquire bilingual vocabularies. Expressive bilingualism in autistic children was instead associated with higher levels of recent direct exposure to the second language and stronger expressive language abilities in the dominant language. Hence, neither autism nor cognitive impairment necessarily precludes the development of bilingual vocabulary.

Referential expressions provide an important point of intersection between morphosyntax, semantics, and pragmatics. Meir and Novogrodsky (2023) investigated the independent and combined effects of bilingualism and autism on the informativeness and definiteness marking of referential expressions. The study compared monolingual Hebrew-speaking and bilingual Russian–Hebrew-speaking children with and without autism. Using an elicitation task in Hebrew, the authors examined the children's use of contrastive referential expressions and definiteness marking. The results showed that bilingualism did not affect the

informativeness of referential expressions, despite the bilingual children having lower language proficiency than their monolingual peers. Informativeness was, however, affected by autism. Definiteness marking was negatively affected by both bilingualism and autism and was largely predicted by morphosyntactic skills. The authors argue that language-specific features, such as definiteness marking, should not automatically be interpreted as evidence of pragmatic difficulty in bilingual children. More language-independent measures, such as informativeness, may offer a more reliable way of assessing pragmatic abilities across languages. This finding is methodologically important because it highlights that apparent pragmatic differences may sometimes reflect the grammatical properties of a particular language rather than a general communicative difficulty.

Narrative abilities have also been examined in bilingual autistic children. Peristeri et al. (2020) found that bilingual autistic children obtained higher scores than their monolingual autistic peers in both narrative microstructure and macrostructure. Their performance was also associated with cognitive control skills. These findings suggest that bilingualism did not adversely affect narrative production or executive functioning and may, in some circumstances, be associated with more elaborate narrative performance. However, these results should be interpreted in relation to the specific characteristics of the participants and the tasks used. A bilingual advantage should not be assumed to occur uniformly across all narrative measures or all bilingual autistic children.

This caution is supported by Beauchamp et al. (2023), who compared bilingual and monolingual autistic children on narrative, social, and pragmatic language measures. The bilingual children performed similarly to their monolingual peers on narrative and social-language measures. Balanced bilingual children performed better on a nonliteral-language task, although the authors did not find a general bilingual advantage in macrostructural narrative abilities or social skills. Narrative language was assessed through the Edmonton Narrative Norms Instrument, which included a story generation task, following a set of pictures, and a story retelling task, without visual support. The assessment also provided

measures of narrative microstructure. Although storytelling abilities were not associated with social skills, pragmatic language abilities were related to some aspects of narrative production, particularly language complexity as measured through mean length of utterance in words (MLU).

Beyond the assessment of individual linguistic domains, recent research has also begun to investigate how multilingual autistic individuals use their languages in everyday communication. This focus is important because multilingual competence cannot be fully understood by examining each language separately. Language choice, code-switching, and adaptation to the interlocutor provide additional information about how autistic individuals navigate their linguistic repertoires across contexts.

Crockford, Gibson, and Katsos (2025), examined multilingual language use and switching behaviour from a self-report perspective, comparing autistic and non-autistic multilingual adults. The study addressed a gap in the literature concerning how multilingual autistic individuals use their languages in everyday life. Participants completed an online questionnaire developed to assess the number of languages they knew, the frequency with which they used them, and the perceived effort involved in switching between languages. The autistic participants described themselves as more multilingual in terms of the number of languages known and reported using their languages at least as frequently as the non-autistic participants. A substantial number of participants also reported using a non-native language on a daily basis. However, autistic participants perceived switching between languages as more effortful than the non-autistic group. The groups were otherwise comparable in terms of having lived in a country where one of their languages was spoken.

These findings suggest that multilingual autistic adults engage actively with their linguistic repertoires and should not be characterised as passive or restricted multilingual language users. At the same time, the greater perceived effort associated with switching languages may indicate that language alternation can involve specific cognitive or communicative demands for some autistic

individuals. Importantly, the study is based on self-report data and therefore provides information about participants' perceptions of their language use rather than a direct measure of switching behaviour in interaction.

Notably, a research on switching behaviour in childhood was conducted by Maes et al. (2026). The authors analysed naturalistic language samples collected from 31 minimally speaking autistic children interacting with their caregivers in two sessions of the Brief Observation of Symptoms of Autism (BOSA), one conducted in English and the other in Spanish. The recordings were transcribed and analysed with respect to mean length of utterance, number of different words, speaking rate, and the use of English, Spanish, or mixed-language utterances. The results showed that the children adapted their language use to the language used by their caregivers, while also displaying an early preference for the societally dominant language. They also suggest that bilingual autistic children may participate in flexible language practices even when their overall expressive language is limited. In this context, mixed-language utterances and language alternation should not automatically be interpreted as evidence of confusion or disordered language development. Rather, they may constitute meaningful strategies through which children respond to their interlocutors and participate in multilingual interactions.

The literature reviewed above indicates that multilingual autistic children show heterogeneous profiles across linguistic domains and communicative contexts. Current evidence does not support the view that multilingual exposure systematically harms vocabulary, morphology, syntax, pragmatics, narrative development, or everyday language use.

1.4 Unexpected bilingualism

As discussed in the previous sections, concerns regarding bilingual exposure for autistic children are often driven by the frequent communicative and linguistic challenges associated with autism. Common major concerns that are thought to

hindered language development in autistic children, regard specific deficits in joint attention and attention to voices (Phillips et al. 2024), and the difficulties in social interaction, core characteristic of autism.

Contrary to this position, recent studies have shown that, while playing a pivotal role for the emergence of language, joint attention may not be necessary to develop language skills, at least for some autistic children (see Kissine, Saint-Denis, and Mottron 2023). Furthermore, empirical evidence shows that several autistic children ultimately acquire language, despite the persisting of challenges within the social sphere.

Interestingly, the broader literature on bilingualism and autism often overlooks the lived experiences of children who spontaneously acquire a second or additional language, despite limited or absent direct interaction in that language. This phenomenon represents a striking example of "Unexpected Bilingualism" (UB), in which an individual acquires a language that is not spoken in their immediate social environment (e.g. through media content consumption). The, although limited, number of studies assessing this singular language trajectory may contribute to the general bilingualism-and-autism discussion in two significant ways.

First, they provide positive cases that challenge traditional restrictions on bilingual exposure in autism. Second, they pose a theoretical challenge to strictly social-interactive models of language acquisition. A central implication of UB is that language may be acquired through indirect or mediated linguistic exposure; indeed, despite experiencing core difficulties in social interaction, several autistic individuals successfully acquire language. This presupposes that language acquisition in autism may follow distinct developmental pathways.

Although the studies reported in the literature present some representational limitations, they nevertheless provide valuable insights into unexpected bilingualism. By documenting linguistic trajectories that remain largely overlooked, these studies contribute to a better understanding of how autistic children may acquire and use an additional language. At the same time, their

findings should be interpreted critically. In particular, some accounts appear to portray autistic children who spontaneously acquire an additional language as exceptional individuals with “splinter” or “savant skills”. Although this framing may challenge deficit-oriented views of autism, it may also risk romanticising autistic experience and reinforcing stereotypical representations of autistic people.

The following section reviews the available studies, considering their contribution to the field.

One of the first and most famous cases is that of Christopher, described as young adult with “savant” skills that enable him to learn multiple languages with incredible speed and facility, sometimes even without formal education or interactive acquisition. At the time of the publication (1995), Christopher was the first documented case of a person manifesting such skills as reading, writing, translating and communicating in fifteen to twenty languages (Smith and Tsimpli 1995). Interestingly, Christopher presented cognitive impairment and a marked discrepancy in his IQ score, combining low-performance IQ with an average or above average verbal IQ.

Indeed, since Christopher’s case was documented, other instances have been reported in the literature. Namely, Vulchanova et al. (Vulchanova et al. 2012) reported a case study of an autistic child, diagnosed with Asperger Syndrome under the criteria of the time, who learned German as a second language through television as his sole source of linguistic input. In 2019, Kissine et al. discussed the case of five children living in Tunisia, where Modern Standard Arabic (MSA) is in a state of diglossia. MSA is virtually never used in everyday conversation and is usually acquired in the late school years. Crucially, Modern Standard Arabic is broadcast across the Arabic-speaking world via television programs and cartoons; therefore, children only encounter MSA before starting school in its spoken form through exposure to television programs and books. Interestingly, the children addressed in Kissine et al. (2019), displayed a significant presence of spontaneous and productive use of MSA in the speech. The authors argue that

the paradoxical mastery of MSA in pre-school autistic children may highlight the existence of a noninteractional language-learning strategy.

Moreover, in 2023, (Zhukova et al. 2023) published their findings about Alex, an autistic 11-year-old Russian boy who acquired English from media exposure. Despite displaying language deficits in both English and Russian, the discrepancy between the languages was particularly striking given the lack of exposure to English, which can be considered Alex's dominant language. Results from this study show that the presence of the input is enough to acquire structural morpho-syntactic and grammatical properties of the language in the absence of reciprocal communication component. Notably, Alex' parents encouraged his interest, moving to Great Britain to accommodate Alex's language development and learning.

Kadiri and Anasse (2023) explored the role of human interaction in language acquisition in their case study about a 6-year-old Moroccan autistic child who acquired English language without receiving formal instruction. Findings suggest that the boy presented a functional and communicative use of the English language, acquired through early exposure to YouTube videos. Strikingly, his linguistic behaviour in English is described by the authors as "verbose", despite being more silent when using the Moroccan dialect.

A particular instance of foreign language mastery is described in Riedel et al. (2020). The authors present the case of a young transsexual man diagnosed with Asperger Syndrome, who displays synaesthesia and a talent for foreign language acquisition. For the young man, a various number of elements (e.g. letters, numbers, spoken word, emotions, noises) lead to highly consistent, vivid colour sensations. Within the study, it is argued that these colour associations might aid categorization, differentiation and storage of information and can thereby contribute to language acquisition ability.

Finally, Morales et al. (2026) reported the case of LC, an 11-year-old Chilean autistic child who learned English via minimal audiovisual exposure. Notably, fine-grained measures of multiple linguistic and pragmatic domains were

implemented to better assess LC language production and comprehension. In line with previous studies, some domains of LC's language were paradoxically better in English than in Spanish; specifically, in terms of pronunciation and fluency LC's speech was more fluent and clearer in English than in Spanish; additionally, LC's vocabulary was unusually rich in a language absent from his social interactions and unusually low in the language that dominated his interpersonal experiences.

Critically, most studies regarding Unexpected Bilingualism consist in case studies and, occasionally, in multiple case studies. To fill this gap, Hindi and Meir (2025) conducted a study investigating unexpected foreign language in autistic children. Participants included 26 English-Hebrew-speaking autistic children and 20 non-autistic children who acquired English and Hebrew naturalistically. Interestingly, the study compared a group of 14 autistic children who acquired English via non-interactive input and 12 autistic children who acquired English naturalistically. Morpho-syntactic abilities were assessed using Sentence Repetition tasks in both languages. The analysis revealed differences in performance only in Hebrew, while in English, the three groups were statistically indistinguishable. Notably, despite the delayed exposure and the non-interactive nature of their input, children in the autistic-non-interactive group achieved comparable mastery in morpho-syntactic skills to their peers, both autistic and non-autistic, who were exposed to English naturalistically at home.

Another positive attempt to enrich the literature diversity is that of Gagnon, Ostrolenk, and Mottron (2025). The study addresses Unexpected Bilingualism in the early minimally verbal period, gathering language-related interests and use of minimally verbal children through a structured questionnaire for parents. Participants were caregivers of 119 autistic, 102 non-autistic clinical, and 75 typically developing (TD) children aged 2–6 years. UB was operationalized as the use of at least one language not spoken in the child's social environment to name letters and/or numbers. Results revealed that a total of 38.7% of autistic children displayed UB, with autistic children being 4.38 times more likely to show UB than

TD children; the non-autistic clinical children did not differ significantly from TD children. Crucially, the presence of UB was not associated with the children's expressive language level. Although presented with a small sample, this study highlights the possibility that UB might not be an “exceptional” or “splinter” skill displayed by a small number of individuals. Further evidence arrives from Dumont et al. (2024) who could identify 12 autistic unexpected bilinguals among 48 children, by simply recruiting French-speaking autistic individuals. The ease with which they identified the sample of children displaying UB suggests that UB is not limited to isolated and exotic case studies but rather constitutes a genuine phenomenon.

Indeed, taken together, these studies suggest that unexpected bilingualism may emerge across different autistic profiles, ages and linguistic contexts and competences.

The instances of possible acquisition beyond common social interaction show the importance of considering forms of language development that are not represented in the mainstream studies and that diverge from the statistical norm.

At the same time, the predominance of case studies and small-scale investigations limits the possibility of drawing general conclusions about the mechanisms underlying UB. Nonetheless, several studies have attempted to formulate hypotheses concerning the cognitive, linguistic, and environmental processes that may underlie this form of language acquisition. These proposals provide a starting point for examining the theoretical implications of unexpected bilingualism. In the next section will be presented some of the hypotheses and their possible implication.

1.4.1 Theoretical Perspectives and Implications of UB

A close reading of the literature makes it possible to identify several recurring features of unexpected bilingualism. Across the studies reviewed, some autistic children display a paradoxical predominance of the language acquired through

non interactive input, at least in some specific linguistic domains (Kadiri and Anasse 2023; Morales et al. 2026; Vulchanova et al. 2012; Zhukova et al. 2023). As noted by (Gagnon, Ostrolenk, and Mottron 2025) hyperlexia and in general a pronounced interest in letters and numbers also appear to be relevant features in some cases. Moreover, caregivers and clinicians report that autistic children watch their favourite cartoons or videos, especially preferred segments, multiple times (Dumont et al. 2024). Finally, in the systematic review by Lim et al. (2025), some bilingual autistic adults highlighted their cognitive strengths, such as hyperlexia, pattern recognition, memory, and focus, as key factors helping them master grammar, vocabulary, and pronunciation of foreign languages.

Vulchanova et al. (2012), drawing from the Weak Central Coherence (WCC) hypothesis of autism, attempted to explain how a pattern of strengths within some autistic profiles can specifically promote language learning, thus explaining the cases of unexpected bilingualism. The authors argue that a local processing bias, at the base of the WCC theory, enables autistic individuals to attend meticulously to structural, phonological, and distributional regularities of language, consequently, extracting language from media-based input.

In line with this view, Dumont et al. (2024) hypothesize that UB children may rely on other cues, such as acoustic cues, of the linguistic input. Indeed, WCC theory predicts that heightened perceptual processing, such as pitch discrimination, may be due to enhanced sensitivity and attention to low-level perceptual information. The authors, further propose that repetitive screen-based input simplifies linguistic complexity, allowing focus on individual cues. In order to verify these assumptions, they conducted a study hypothesizing that autistic UB children exhibit superior pitch discrimination compared with both autistic and non-autistic peers. Findings revealed that the autistic UB group demonstrated superior pitch discrimination relative to autistic and non-autistic peers.

Furthermore, Dumont et al. (2025), investigated nonadjacent dependency learning in autistic children who acquire English through screen exposure. Theoretical framework for this study is provided by the assumption that statistical

learning plays a key role in language acquisition, particularly for complex structures, such as nonadjacent dependencies, that are ubiquitous in natural language syntax. Result from the study revealed that both non-autistic and autistic children with close to typical language ranges can learn non-adjacent dependencies from passive exposure to unfamiliar linguistic input. Crucially, autistic-UB exhibited significantly faster learning as compared to their autistic and non-autistic peers.

All these studies highlight how Unexpected Bilingualism in autism might be associated with distinct cognitive abilities that enables, at least some individuals, to learn a language not spoken in their social environment. Kissine (2021) argues that these studies can contribute to the discourse of the nature of language, posing a crucial challenge for the constructionist approach in favour of a nativist theory. Despite its intrinsically theoretical value, more studies are needed to fully develop a linguistic theory. Nonetheless, the study of unexpected bilingualism can be of extreme value to provide evidence-based advice for caregivers of autistic UB children, who do not know whether they should encourage the exposure to screens in foreign languages. Moreover, the study of unexpected bilingualism may contribute to a more comprehensive understanding of autistic language development in its own right. Its value should not depend exclusively on the possibility of challenging existing theories of language acquisition or identifying cognitive and linguistic advantages associated with bilingualism. Studying these experiences without reducing them to a deviation from a normative developmental trajectory may help describe the diversity of autistic language development on its own terms.

This approach is consistent with calls to move beyond deficit-based and advantage-oriented accounts of bilingualism in autism, recognising autistic bilingual experiences as valuable forms of linguistic and social experience rather than primarily as evidence for or against a cognitive advantage (Andreou and Skrimpa 2022; Digard et al. 2023).

2. Methodology

2.1 Participants and Sampling Procedure

Participants were recruited from an accredited clinical and rehabilitation centre located in the urban area of Venice, Italy. Initially, a broader sample of children receiving speech-language therapy was screened for eligibility. However, over the course of the study, only three children fully completed all experimental and observational phases due to logistical challenges, including health-related absences, communication barriers with families, and limited scheduling availability. To ensure complete anonymity, they are referred to throughout the study simply as A, B, and C.

Prior to data collection, written informed consent and privacy disclosures were obtained from the participants' parents. The consent protocol explicitly outlined that participation was entirely voluntary and that legal representatives retained the right to withdraw from the study or revoke their consent at any time without compromising the children's ongoing therapeutic programs. The study was previously approved by the University Ethics Committee for research involving human participants.

Research design comprised three main steps to collect different data. First, a semi structured parental interview was conducted; subsequently parents were requested to complete selected sections of the *Montreal Bilingual Language Use and Exposure Questionnaire, M-BLUE* (Multilingual Families Lab Tools 2018). Lastly, a play-based therapy session of each child was video recorded, allowing to collect ecologic linguistic samples.

Detailed specifications and theoretical rationales for each of these assessment tools are discussed in the following subsections.

2.2 Data Collection Tools

2.2.1 Semi-Structured Parental Interview

To gather comprehensive qualitative and quantitative data regarding the children's linguistic background and communicative profiles, an ad-hoc semi-structured interview was developed. Existing standard instruments often present accessibility constraints when applied to minimally verbal children on the autism spectrum; therefore, specific items were selectively created to better fit the targeted clinical population. Rather than treating language exposure as a static background variable, the questionnaire was designed to investigate the dynamic interplay between environmental input, media exposure, pragmatic utility, AAC integration, and family sociolinguistic perceptions.

The instrument is organized into six sections, for a total of 45 questions, each serving a specific methodological and clinical purpose. A first domain of fourteen questions was created to gather anamnestic information including diagnostic history, age at diagnosis, educational placement, and migration history. A second domain assessed linguistic usage throughout the years, tracing the evolution of family communication before and after the diagnosis. A dedicated item investigates the specific rationales underlying parental language choices (e.g., spontaneous preference, professional clinical advice, or educational necessity). Furthermore, this section evaluates language choices across different interlocutors (mother, father, siblings, peers) and intimate, family practices (lullabies, shared book reading). Additionally, to better understand instances of “unexpected language exposition” and therefore “unexpected bilingualism”, a third section was created, targeting digital media exposure. The module specifically investigates screen time, content selection, and interactional behaviours (e.g., silent viewing vs. echolalic repetition or active commenting). A pragmatic section was added to better assess language selection across distinct pragmatic functions (e.g., making requests, sharing joint attention, engaging in private speech/play). Furthermore, the questionnaire explores language

switching behaviours, investigating whether code-switching is context-dependent or driven by a child's preferences. A specific item assesses echolalic routines (e.g., media scripts) and functional, generative language use. The last question of this domain tracks long-term shifts in preferred expressive language. A fifth section targeting AAC (Augmentative and Alternative Communication) was implemented to investigate AAC usage throughout the years, examining the structural configuration of the system (e.g., PECS, low-tech boards, high-tech dynamic display devices) and the language(s) programmed within it. Crucially, it evaluates whether a monolingual AAC configuration (typically restricted to Italian) creates a structural barrier that limits the expression of family values, cultural identity, or home language continuity. Finally, the last domain explores qualitative aspects of parental experience, including perplexities regarding potential language confusion, the personal value attributed to heritage language acquisition, and whether professionals gave parents specific recommendations regarding language choices (e.g., medical or educational advice to adopt a monolingual approach). This provides critical insight regarding sociolinguistic context and emotional dynamics surrounding language choices. This is particularly relevant given that many clinicians and educators, contrary to current empirical evidence, continue to advise families to adopt a monolingual approach, often reinforcing parental fears that exposure to multiple languages may induce cognitive confusion (Beauchamp and MacLeod 2017; Hantman et al. 2023). The pervasive nature of this dilemma in everyday life is further reflected in public science outreach, where scholars have explicitly addressed these anxieties to guide families through complex linguistic decisions (e.g. (Gibson, Howard, and Katsos 2019)).

To ensure accessibility and cultural sensitivity, both Italian and English versions of the interview were created, allowing families to select their preferred language for administration. The 45 items served as a semi-structured conversational baseline, allowing the examiner to flexibly expand upon emerging topics. Parental inputs were fully accommodated even when responses diverged

from the primary prompts, as these spontaneous insights provided valuable contextual details regarding the child's communicative environment.

Interviews were conducted in person at the clinical centre during the children's regularly scheduled therapy sessions with other clinicians, thereby reducing logistical burdens on the families. The completion time varied depending on the depth of parental responses, averaging approximately 45 minutes per session.

2.2.2 Multilingual Measurement: Adaptation of the M-BLUE

Following the semi-structured interview, parents were requested to complete selected sections (Sections B through G) of the Montreal Bilingual Language Use and Exposure Questionnaire, M-BLUE (Multilingual Families Lab Tools 2018). The primary rationale for incorporating the M-BLUE lies in addressing a well-documented methodological limitation in multilingual clinical research: namely, the general lack of specificity in traditional tools when quantifying real language exposure and output in non-standard bilingual trajectories.

This methodological choice directly aligns with the recommendations outlined in the systematic review by Hartman et al (Hantman et al. 2023). The authors highlighted a critical gap in the literature on autism spectrum disorder and bilingualism, noting that only a small subset of studies systematically report language acquisition history alongside bilingual usage or exposure metrics. As Hartman et al. (Hantman et al. 2023) emphasize, language acquisition history and exposure are strongly associated with language proficiency, vocabulary depth, and morphological skills in autistic children. Consequently, omitting detailed language profiling represents a missed opportunity to fully understand the linguistic mechanisms at play in neurodivergent populations.

Furthermore, Hartman et al. (Hantman et al. 2023) stress that bilingualism is inherently non-uniform, as diverse home, community, and educational environments yield vastly different communicative experiences across individuals. To overcome the limitations of vague, qualitative descriptors (e.g.,

being exposed "most of the time"), they recommend that researchers adopt precise, continuous percentages to quantify both cumulative exposure and active language utility, while explicitly accounting for both dominant and minoritized languages.

The M-BLUE Questionnaire captures quantitative proportions of input and output language usage across different environmental settings (e.g., home vs. therapeutic or educational contexts). This quantification provides a rigorous empirical foundation to disentangle complex multilingual profiles.

Although the M-BLUE is originally in English and French, real-time translational support into Italian was provided by the researcher to ensure accurate comprehension and prevent misunderstandings. Furthermore, guided support was offered throughout the administration process to assist parents in accurately estimating language proportions across different daily routines and communicative contexts.

2.2.3 Video-recordings

Following the preliminary data collection, linguistic naturalistic samples were collected through video recordings. For each child a 30-to-45-minute registration was retrieved, in order to allow a finer analysis of linguistic behaviours in ecological contexts. Crucially, this design choice directly addresses a prominent gap in the existing literature: while standardized tests and retrospective parental questionnaires are widely employed in clinical multilingual research, there remains a substantial lack of observational, empirical data detailing naturalistic language use. Due to logistical constrain, the observational setting was the speech-language therapy room at the clinical centre, a familiar environment for all participants. While this setting departs from a typical naturalistic setting, every effort was made to preserve communicative spontaneity.

Recordings were carried out during semi-structured play interactions where children were free to choose their preferred play activities, with the primary

examiner guiding the interaction solely to maintain safety and gently facilitate spontaneous communicative exchanges.

The primary examiner is a native Italian speech-therapist with Upper-Intermediate (B2) English proficiency. For two of the participants, observation was conducted solely with the primary examiner, who regularly conducts their weekly therapy sessions. However, in the case of A., the only child who does not receive weekly therapy directly from the primary examiner, both the primary examiner and A.'s primary speech-language pathologist were present in the room. This adjustment was implemented to ensure the child's emotional comfort.

2.3 Multimodal Annotation and Data Analysis

Video recordings were transcribed and analysed using the ELAN software (ELAN | The Language Archive n.d.) for multimodal speech analysis. A custom tier hierarchy was established to capture both verbal and non-verbal communicative behaviours:

CHI_Utterances: primary tier dedicated to transcribing the child's vocal and verbal productions.

THR_Utterances / THR2_Utterances: tiers dedicated to transcribing clinician utterances (a second therapist tier was included specifically for A.'s recording session).

CHI_Writings: tier configured to annotate graphic and written productions (of critical relevance in specific participant profiles, such as B.).

CHI_Gestures: tier dedicated to annotating non-verbal communicative movements, pointing, and motor behaviours when functionally relevant.

To evaluate communicative competence, a comprehensive analytical matrix was developed, divided into Lexical Analysis and Pragmatic Analysis (see Table 1 and 2).

Pragmatic Analysis					
	English	Italian	Code-Mixing	Other Language(s)	Unidentified
Request					
Interaction					
Answer					
Initiating					
Echolalia					
Private-speech					
Communicative Echolalia					
Undetected					

Table 1

Lexical Analysis						
	Italian		English		Total	
	Token	Types	Token	Types	Total token	Total types
Nouns						
Verbs						
Adjectives						
Adverbs						
Numbers						
Letters/Alphabet						
Other						

Table 2

A fundamental parameter in both analytical domains was the differentiation between languages: Italian, English, and Other Languages, alongside the systematic coding of Code-Mixing behaviours.

The pragmatic analysis of the video-recorded play sessions was designed to capture how participants deploy their linguistic repertoire and to examine whether specific communicative behaviours correlate with particular languages choices. Beyond mapping present-day expressive competencies, this analytical step allowed for a longitudinal comparison with past developmental profiles, retrieved via semi-structured parental interviews and clinical medical records.

To analyse the child's verbal output, speech was first segmented into discrete utterances based on prosodic contours, natural pauses, and conversational turn-taking boundaries. Utterances were then systematically categorized according to primary communicative functions, incorporating categories such as *Request*, *Interaction*, *Answer*, *Initiating*, *Private-Speech*, *Echolalia*, *Communicative Echolalia*, and *Undetected*. A crucial qualitative distinction was established between non-functional or non-interactive repetitions (*Echolalia*) and functional, context-relevant repetitions (*Communicative Echolalia*), which served clear pragmatic goals such as sustaining turn-taking during play or signalling comprehension to the interlocutor.

Utterances that were unintelligible or low-volume were labelled as *Undetected*; however, whenever a clear communicative intent was evident despite motor-speech or production breakdowns, the utterance was categorized under its functional intent (e.g., *Answer*). In cases where an utterance exhibited multi-functional potential, it was assigned to the single pragmatic category judged to be most contextually salient to that specific communicative exchange.

In parallel with the pragmatic evaluation, a systematic Lexical Analysis was conducted to categorize the structural components of the child's expressive output across four primary communication channels: Italian, English, Other Language(s), and AAC (Augmentative and Alternative Communication).

Utterances were coded according to grammatical and semantic classes, specifically isolating Numbers, Letters/Alphabet, Verbs, Nouns, Adjectives, Adverbs, and an omnibus “Other” category. The *Other* classification served a dual purpose: it encompassed functional word types such as articles and pronouns, while also capturing fragmented, truncated, or repetitive productions that could not be reliably established as stable entries within the child’s active lexical repertoire. The categories Numbers and Letters/Alphabet were explicitly included within the lexical grid to track specific interests, characteristic of this population. In accordance with (Gagnon, Ostrolenk, and Mottron 2025), autistic children with unexpected bilingual profiles frequently display their emerging bilingual competencies through the spontaneous recitation or manipulation of alphanumeric sequences in a preferred, non-societal, language. Isolating these two specific categories makes it possible to capture early, subtle markers of bilingual development and autonomous language selection that would otherwise be masked by traditional lexical coding schemes.

The primary objective of this lexical analysis was to evaluate the structural complexity of the child’s output, specifically assessing whether expressive productions demonstrated signs of generative grammar or remained restricted to isolated lexical labels (e.g., single-word naming). To complement this categorical distribution, a qualitative and quantitative cross-analysis was performed. This included calculating both total word counts (the overall volume of lexical items produced) and unique tokens (the number of distinct, non-repeated vocabulary items, serving as an indicator of lexical diversity). Finally, cross-analyses were conducted to examine language-specific preferences, identifying whether particular lexical categories (such as nouns or verbs) were disproportionately produced in one language relative to another.

2.3.1 Use of generative AI tools

Gemini AI (Google; version “3.6 Ragionamento”) was used to generate Figures 1, 3 and 5, i.e. the heatmaps showing the distribution of utterances across pragmatic functions and languages for Cases A, B and C (Chapters 3–5). The tool was provided only with the aggregated counts reported in Tables 3, 5 and 7; no personal data or recordings were shared. The author checked every figure against the corresponding table and take full responsibility for their accuracy.

3. Case A

A. is a nine-year-old child born in Italy to Kosovars parent. He lives in the Venice area, Italy, with his mother, father and thirteen-year-old brother.

At the age of three, he was enrolled in the local school and later, at the age of six, he transitioned to a monolingual Italian elementary school.

A. is a calm and solitary child, aware of his communication difficulties. Outside school, he spends most of his time at home with his family. A. generally exhibits a preference for solitary play, although he is very close with his cousin, who attends the same school. His primary recreative activities include watching YouTube videos and gaming online via the Roblox platform. He used to take swimming classes, however he stopped at the age of six.

3.1 Clinical Background and Diagnostic Profile

At the age of three A. received the diagnosis of Pervasive Developmental Disorder Unspecified (PDD-NOS; code F84.9), according to the ICD-10 Classification (ICD-10: international statistical classification of diseases and related health problems: tenth revision n.d.). He was first referred for a speech and language evaluation at age six and initiated speech therapy a few months later.

On the Leiter Scale (Roid and Koch 2017), he performed within the typical range with a Full Scale IQ of 102 (Brief IQ: 98). However, a significant cognitive discrepancy was observed across cognitive domains: while Fluid Reasoning (FR) scored in the low average range (88), Visualization (VI) scored significantly above the typical range (131). On the most recent cognitive assessment, A. scored within the superior average range on the Raven's Coloured Progressive Matrices (Raven 2012), placing in the 88th percentile.

During the first speech evaluation, A. displayed limited linguistic skills. Nonetheless, as reported by the mother, doctor and therapist, A. showed a great

amount of English vocabulary, which was surprising given the limited linguistic abilities showed in both Italian and Albanian.

Initial language evaluations were conducted exclusively in Italian due to a lack of assessment tools in English and Albanian. Receptive language was limited to high-frequency vocabulary and short, contextualized sentences. At the time, a picture AAC system was selected in order to support A. at school. The communication system was structured in Italian.

A. produced frequent jargon speech, especially during free-play and unstructured activities. According to his most recent speech evaluation, A. manifests critical oral motor planning that negatively impacts speech intelligibility, contributing to the persistence of jargon-like productions.

At the time of the present study, A. still presents jargon speech, although more limited. His linguistic abilities show a positive developmental trajectory; A. displays finer conversational abilities. The child manifests better intentionality and he is more involved within the conversation. Whilst still below age expectations, both lexical comprehension and production skills have shown progress. Currently, A. expresses himself primarily in Italian. Semantic skills have also improved, with the child successfully categorizing items based on shared attributes and functions. Morphosyntax remains a vulnerable domain, though gradual improvements are observed in both comprehension and production.

3.2 Semi-Structured Parental Interview

To reconstruct the participant's sociolinguistic context, a semi-structured interview was conducted with his mother.

Both parents are originally from Kosovo and report using Albanian at home. However, the mother specifies that due to his lack of competence in Albanian language, when speaking directly to the child, everyone tries to use Italian, which the child better understands. Indeed, A. actively speaks in Italian with all family members. During nighttime, when A. was younger, the mother used to tell Kosovar

stories in Albanian; notwithstanding A. never showed interest in the language. A. was always fascinated by English, which was his first language until recently. The mother reports that before the age of six, A.'s receptive and productive skills were better in English than in other languages, even though both parents display almost null competence in English. Nowadays and from the age of six (when he entered elementary school), A. started switching from English to Italian to express himself and to make requests, although he still uses English during free and solitary play or when he doesn't know an Italian word. According to his mother, A. switches to English whenever his interlocutor shows limited Italian skills despite their nationality. When asked which language the child seems to understand better, the mother answers English and adds "*adesso anche italiano*" (now also Italian).

From the age of 3 to 6, a picture-based Augmentative and Alternative Communication (AAC) system was utilized to support A.'s communicative needs. The AAC system was configured exclusively in Italian. When questioned regarding whether this monolingual choice constituted a constraint for domestic communication, the mother reported that she did not perceive it as a limitation.

The parental interview revealed a complex and ambivalent attitude toward home multilingualism. While the mother expressed concern that exposure to Albanian might induce language confusion in A., she nevertheless continues to use her heritage language. This choice is driven by both her self-perceived limited fluency in Italian and a strong conviction regarding the cultural importance of maintaining the family's native language. Indeed, she emphasized the value of A. acquiring Albanian, though she acknowledges his developmental difficulties. She sometimes attributes his challenges in mastering the heritage language, to its intrinsic structural complexity. Notably, she reported that school educators frequently advised her to adopt exclusively Italian within the home environment.

Regarding A.'s English acquisition, the mother identified electronic devices as the primary source of input. When A. was younger, he accessed content via smartphone, though his preferred device is the tablet, which he uses for 3 to 4

hours a day, increasing during weekends. The mother observed that although A.'s sibling shares similar access to mobile devices, he does not exhibit the same pattern of English language adoption. In the past, A.'s digital engagement included a YouTube channel (*Vlad and Niki*), featuring children performing science experiments in Moldavian; during this period, the mother noted that A. briefly produced a few words in Moldavian. Currently, his media consumption consists predominantly of *Minecraft* and English-language content. During screen-time, A. usually stays silent or laughs.

3.3 M-BLUE assessment

To better assess the language exposure, a subset of the M-BLUE questionnaire (Multilingual Families Lab Tools 2018) was also conducted with his mother. Specifically, the sections B to G were selected.

As for the section B, relatively to language related to the mother, she rated herself as very fluent (4) in Italian (majority language), fully fluent (5) in Albanian (minority language and heritage language of the family), yes she only rates her English skills as 1 (limited fluency). She declares that she talks in Italian with the child around 28.1-33 hours in a regular week and 34.1-40 hours during weekends. As for the Albanian language, the child has direct contact with his mother, in a regular week, around 28.1-33 hours and the same amount during weekends. The mother declares little to no contact in English both during weekdays as well as Saturdays and Sundays.

As for the section B, relatively to the father, it is declared he is fully fluent in Italian and Albanian and somewhat fluent in English (2). The father has 22.1-27 hours of direct contact in Italian with the child during all week, 28.1-33 in Albanian during weekdays and 22.1-27 during weekends. No direct contact is declared for the English language during the whole week.

At school (section D), A. receives 34.1-40 hours of direct contact in Italian. An average week of school is 40 hours in Italy. The mother reports little to no contact

at school for the Albanian language. From the age of 6, A. has been attending English classes two times a week for a total of two hours per week, as stated by the Italian school system.

The mother states that when A. was younger, Albanian was the only language spoken at home.

For the section E, the mother declares that the child speaks with his brother in both English and Italian, for about 34-40 hours per week and on the weekends.

During the week, A. encounters other family members such as aunts, uncles and cousins. They all speak Albanian but when directly speaking with A., they usually switch to Italian for better understanding. His cousin especially, as they attend the same school, though in different classes, and they often see each other after school and every Saturday and Sunday. As for the grandparents, the child rarely sees them other due to the geographical distance. With all family members, A. prefers to use Italian to communicate.

A. doesn't directly watch the television, nonetheless the mother reports that the family regularly watches movies or other contents in Albanian, either during or after dinner. According to the mother, Albanian music is played in the household almost all day.

Literacy activities are predominantly mediated by A.'s brother, who reads books to him in English on Fridays and Saturdays, for approximately 5 hours per week. A. does not engage in independent reading.

A critical element in reconstructing A.'s communicative history concerns the nature and timeline of his language exposure. Although A. was continuously exposed to Italian from the age of three through his attendance at a mainstream preschool, parent-report indicates that English remained his primary and preferred language for expression and comprehension until he entered primary school at age six. Additionally, at the age of six, a medical report notes a *"positively evolving ability to name objects, frequently deploying English terms acquired from videos"*

However, a major methodological constraint in evaluating A.'s early language profile is the absence of specific quantitative or qualitative data regarding his English proficiency. Formal neuropsychological and speech-language evaluations conducted by the public health services focused exclusively on Italian, aside from brief qualitative observations. This limitation stems from a systemic gap: neither the multidisciplinary clinical team nor the family possess accessible assessment tools to measure non-native language competence in children with atypical language development. Unfortunately, this lack of clinical tools is a common issue within the Italian healthcare system.

Consequently, claims regarding A.'s early English "fluency" rely entirely on qualitative parent-report. From a clinical linguistics perspective, it remains undetermined whether his early output reflected a true generative grammatical system or an extensive repertoire of isolated lexical items and echolalic chunks that parents interpreted as English fluency.

3.4 Speech analysis

A 38 minutes recording was collected during a speech therapy session. A., his speech therapist and the examiner were present in the room at the time of the recording. A. knows the examiner by previous interactions that happened in the clinic. The session was informal and play-based. A first conversational moment was implemented to stimulate oral production. During the conversation, the child was comfortable. Later on, the child was asked to denominate a list of food depicted in a paper. The activity was enriched with conversational and playful comments. A. showed some difficulties denominating some of the items, and when experiencing anomies, he usually went for the English label. Later, the child, the therapist and the examiner engaged in a card game (*Miconia*). In the last minutes of the session, the child played only with his therapist.

The table below (Table 3) reports the pragmatic analysis of the video-recording.

Pragmatic Analysis A					
	Italian	English	Code-Mixing	Unidentified	Total
Request	5				5
Interaction	160	2	3		165
Answer	127	9	5	2	143
Initiating	4				4
Echolalia					0
Private-speech	8				8
Communicative Echolalia	23	2			25
Undetected				34	34
Total	327	13	8	36	384
Total %	85%	3%	2%	9%	100%

Table 3

As shown in Figure 1, across 38 minutes of video-recorded play sessions, A. produced a total of 384 utterances. Among these, 36 utterances (9%) were categorized as either unintelligible or inaudible.

Regarding language distribution, Italian served as the predominant medium of expression, accounting for 85% of total utterances, whereas English comprised only 3%. This marked discrepancy indicates that Italian is currently A.'s primary expressive language.

A total of 8 instances of code-mixing were identified. One notable example is the production "*scratch-a*", composed of an English verb root (*scratch*) combined with the Italian third-person singular present indicative suffix *-a*. This example suggests an emerging mastery of generative Italian morphology. The remaining instances of code-mixing primarily involved lexical insertion.

From a pragmatic perspective, the vast majority of A.'s utterances served interactive and responsive functions, with Interaction (43%, $n = 165$) and Answer

(37%, n = 143) representing the most frequent categories. Communicative echolalia accounted for 6.5% of total production (n = 25) and constituted the sole form of echolalic output observed during the sessions. Finally, spontaneous initiatives remained low: only 5 requests and 4 initiations were recorded, all produced exclusively in Italian.

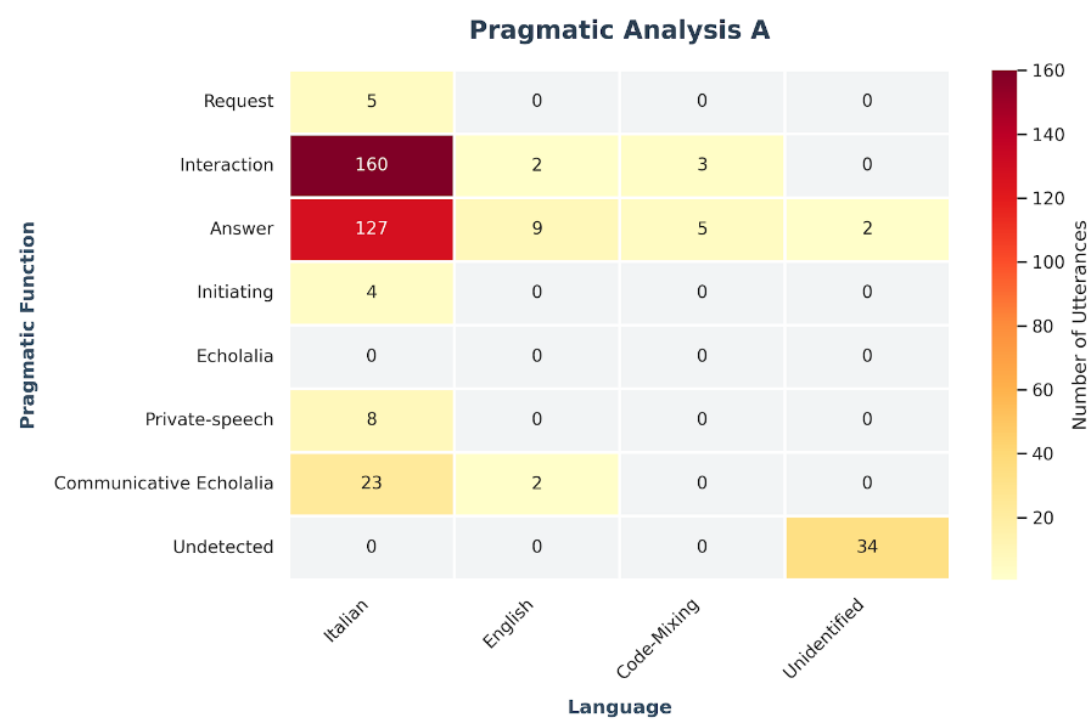


Figure 1. Heatmap of utterance distribution across pragmatic functions and language choices for Case A.

The distribution of word tokens and types across grammatical categories is reported in the table below (Table 4).

Lexical Analysis A.						
	Italian		English		Total	
	Token	Types	Token	Types	Total token	Total types
Nouns	184	102	20	12	204	114
Verbs	172	63	2	2	174	65
Adjectives	50	33	0	0	50	33
Adverbs	124	21	3	1	127	22
Numbers	2	2	0	0	2	2
Letters/Alphabet	0	0	0	0	0	0
Other	353	95	2	2	355	97

Table 4

As illustrated in Figure 2, a total of 913 words (334 types of words) were pronounced by A., with the exclusion of “unintelligible”, “mumbles” and “inaudible” utterances that were not suitable for the analysis.

The most frequently produced category was Other, which encompassed functional items such as pronouns, determiners, conjunctions, and exclamations, alongside incomplete phonetic attempts and failed word targets. Despite generating the highest token frequency, this category yielded only 97 unique types. This is highly representative of the closed-class nature of functional categories (e.g., articles, prepositions, and conjunctions), which are characterized by high repetition rates of a limited lexical inventory.

The second and third most frequently produced categories were Nouns ($n = 204$) and Verbs ($n = 174$). Notably, these two lexical classes differed significantly in their lexical diversity: while 115 unique types of nouns were produced, only 65 verb types were identified. Additionally, Adverbs accounted for 127 tokens across

22 unique types, whereas Adjectives comprised 50 tokens distributed over 33 types.

A more nuanced analysis reveals the presence of 13 distinct English noun types, generating a total of 20 English noun occurrences. This subcategory constitutes 9.8% of the total nominal production. Finally, minor occurrences of English words were also observed among verbs (2 tokens, 2 types) and adverbs (3 tokens, 1 type).

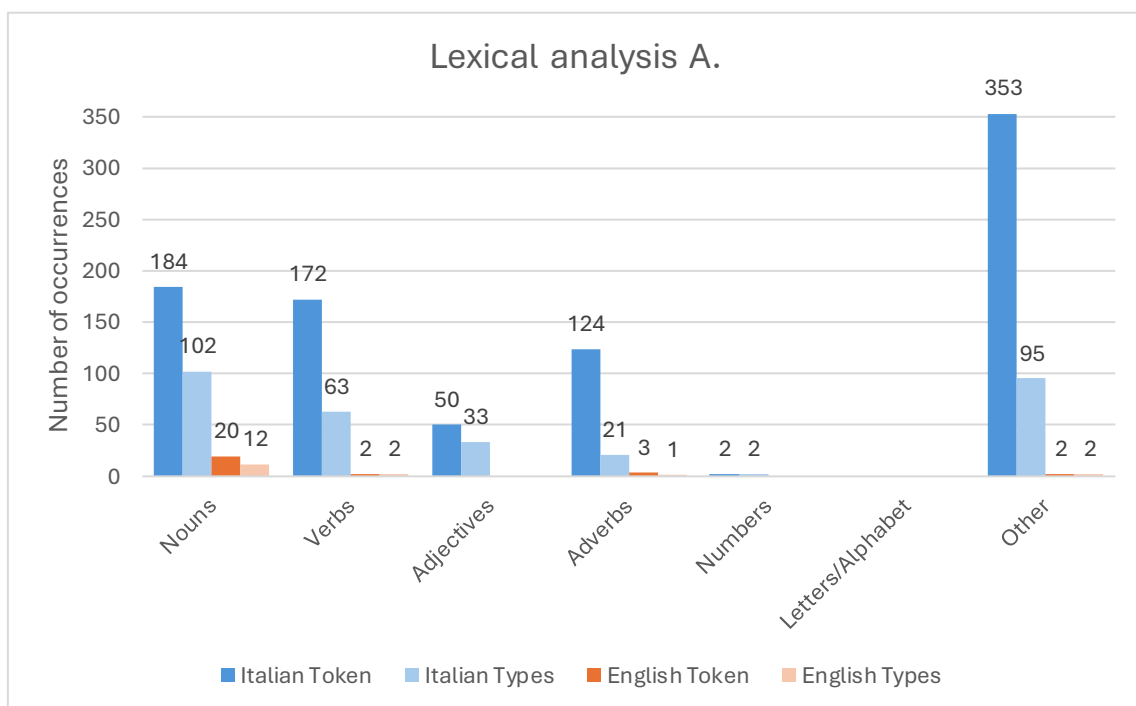


Figure 2. Distribution of lexical items for Case A across languages.

3.5 Discussion

The qualitative and quantitative findings offer a comprehensive picture of A.'s communicative and linguistic profile. From a methodological standpoint, the marked predominance of nominal targets (n = 204 tokens; 115 types) must be interpreted in light of the clinical setting, as part of the video-recorded sessions included picture-naming tasks and visual identification games where A. was explicitly prompted to label illustrations and objects. This activity artificially inflated

the nominal count, eliciting a task-dependent *noun-bias* alongside his spontaneous naming tendencies.

Pragmatically, A.'s communicative repertoire displays a clear asymmetry between responsiveness and assertiveness: there is an evident dominance of Interaction (43%) and Answer (37%) acts, contrasted with minimal spontaneous Requests (1.3%) and Initiations (1.0%). This behaviour suggests a responsive profile where the child relies heavily on partner-led scaffolding. Nevertheless, in full alignment with his medical reports, this quantitative imbalance does not indicate social withdrawal; A. demonstrates active communicative intent and genuine emotional engagement within the interlocutors, using his available verbal resources to maintain social connection despite structural linguistic limits.

Qualitatively, A.'s verbal output reveals an emerging mastery of Italian inflectional morphology, although persistent application errors are evident through all analysis. He produces multiple inflected forms of verb, such as participle, present indicative, and infinitive variants (e.g., *messo*, *mette*, *mettere*, *metto*; *mangia*, *mangiato*, *mangio*), as well as gender and number variations in adjectival agreement (e.g., *rossa*, *rosse*, *rosso*). This proves that his lexicon is not composed of frozen routines but rather points to a transition phase toward rule-based generative grammar, even though these forms are not always deployed in the correct morphosyntactic context.

A.'s linguistic trajectory presents a striking case of atypical bilingualism. Despite substantial daily exposure to Albanian at home, A. does not produce Albanian utterances. Instead, his initial expressive communicative channel was English, driven by a strong personal affinity for the language. This represents a clear example of unexpected bilingualism, in which a person autonomously selects a preferred language of expression, usually via media exposure, over the primary language of the household. Over time, however, a shift occurred, consolidating Italian as his primary expressive medium (comprising 85% of total production), while English remains an auxiliary compensatory strategy (3% of utterances; 9.8% of noun types). Notably, A. displays a clear metalinguistic

awareness when switching channels, systematically deploying English as a strategic resource during word-finding difficulties or retrieval blocks in Italian. Interestingly, when directly prompted by the clinician to speak English, A. exhibits reluctance or refusal. This behaviour suggests different hypotheses: an internalization of past warnings from parents or teachers urging him to speak Italian, or the consolidation of Italian as his primary expressive language.

The precise mechanisms underlying his complete non-adoption of Albanian, his initial adoption of English, and his subsequent transition to Italian raise fundamental questions regarding language acquisition in autistic profiles, which will be further elaborated in the final General Discussion.

4. Case B

B. is a seven-year-old boy born in Italy to Filipino parents. He is the youngest of three siblings, alongside a thirteen-year-old brother and a nine-year-old sister. His medical history includes a diagnosis of Kawasaki disease in infancy. He lives in the province of Venice with his family.

B. is a sweet, energetic child who enjoys drawing with crayons and physical movement. He entered the local school system at the age of three and is currently enrolled in the second grade of elementary school, which includes weekly swimming lessons during school time. Outside of school, he receives two hours of weekly therapy, comprising speech and occupational therapy.

While he predominantly engages in solitary play, he maintains a close bond with his sister and spends most his time at home or in local parks with his mother and sister. B. demonstrates a strong interest in letters, numbers, and colours. He frequently consumes digital content via YouTube, where he watches videos with subtitles and listens to alphabet songs in multiple languages.

4.1 Clinical Background and Diagnostic Profile

B. was initially referred to public neurodevelopmental services at the age of 2 years and 9 months, receiving a formal diagnosis of Autism Spectrum Disorder, F84.0 according to ICD-10 criteria (ICD-10 : international statistical classification of diseases and related health problems: tenth revision n.d.). Standardized evaluation via the ADOS-2 yielded scores exceeding clinical cutoff thresholds across both the Social Affect and Restricted and Repetitive Behaviour domains. Administration of the Leiter-R cognitive assessment was suspended due to behavioural dysregulation and attentional constraints. Clinical observations highlight executive dysfunction, particularly within response inhibition and attentional shifting, with sustained attention restricted to highly motivating activities.

According to B.'s first speech evaluation, his receptive language competencies are largely contextualized. Expressively, he produces some words, although he frequently relies on physical strategies using adult-hand leading to signal requests.

To support his communication, an Augmentative and Alternative Communication (AAC) system based on low-tech picture exchange was introduced by his initial speech therapist. This system was configured exclusively in Italian and integrated within the school environment, though it was not adopted within the household. Clinical evaluations emphasized B.'s dependence on visual cues for both comprehension and expressive output. Currently, B. continues to use low-tech AAC at school while undergoing clinical assessment for a high-tech electronic AAC device.

At the present time, B.'s spoken language is characterized primarily by single-word productions, marked by articulation difficulties and variable phonological attempts at the same target word. Additionally, he exhibits a tendency to pronounce words as written (e.g. /'tube/ instead of /'tu:b/ or /'tju:b/). When encountering expressive breakdowns, B. attempts to write words by tracing letters in mid-air or onto surrounding surfaces, rather than requesting paper or writing materials. Notably, B. produces orthographic representations across multiple language systems, utilizing distinct writing scripts. Naturalistic observations document his spontaneous use of the Italian, English, and Cyrillic alphabets.

4.2 Semi-Structured Parental Interview

The semi-structured parental interview revealed that the mother moved to Italy from the Philippines in 2013, whereas the father had settled in the country at a young age. B. was born in Italy and is the youngest of three siblings. A significant branch of the extended family resides in California, USA, introducing an additional element to the multilingual family's context.

Inter-parental communication relies on a fluid multilingual repertoire comprising Ilocano (one of the multiple languages spoken in Philippines), Tagalog, and English. However, when communicating with the child, parents prefer to use Italian and English. The parents also report an initial attempt to expose all three children to Tagalog and Ilocano; however, perceiving a lack of functional comprehension, they shifted their domestic communication strategy to Italian and English. This decision was guided by pragmatic factors: Italian was adopted to facilitate socio-educational integration in the country, while English was prioritized to ensure communicative competence and relationship maintenance with family members in California.

While the father uses both Italian and English with the children, the mother utilizes Italian and English as primary languages, occasionally reverting to Tagalog when encountering lexical or expressive constraints in the former two languages. Sibling interaction occurs exclusively in Italian and English.

Outside the domestic sphere, B. is predominantly exposed to Italian through school attendance, peer interactions, occupational therapy, and swimming classes. Formal institutional instruction in English is limited to a single hour per week within the primary school curriculum. However, in clinical speech therapy sessions conducted by the examiner, English input is selectively integrated in order to maintain engagement and secure a better communication.

Intimate and affective home routines reveal nuanced language choices: lullabies and children's songs are selected in both Italian and English depending on the repertoire (e.g., *Twinkle, Twinkle, Little Star*), whereas shared book reading is conducted exclusively in Italian, driven by the availability of local literacy materials. When evaluated on receptive competence, the mother suggested Italian as B.'s primary language of comprehension, though uncertainty remains regarding his proficiency across languages.

Digital devices represent a major pathway for language exposure in B.'s daily routine. Transitioning from early smartphone use to tablet, B. accesses screen

media for approximately two hours per day, complemented by continuous background television presence in the household.

B.'s media preferences demonstrate a dynamic, diachronic evolution of language choices. At the time of evaluation, his self-selected digital media content spanned English, Italian, Russian, and more recently, Korean. Retrospectively, his media intake also encompassed French and German. As reported by his mother, during screen-time B. echoes auditory input and transcribes written text directly onto paper, a mechanism through which he independently acquired literacy skills in the Cyrillic alphabet. Furthermore, his mother states that the input offered by the media strongly influences his autonomous play behaviours. While functional communication with interlocutors relies primarily on Italian and English, B.'s solitary play features expressive lexical items in non-societal languages. Indeed, B's mother identified Russian lexical items during doll-directed pretend play, thanks to mobile translation applications (e.g. Google Translate).

As he grew up, B. demonstrated self-directed multilingual counting and toy-alignment routines in French and German, patterns that subsequently shifted toward Russian and Korean. Interlocutor-driven language switching is also observed: B. often exhibits language alignment based on the input language of his conversation partner. When queried regarding the nature of B.'s utterances, the mother observed that his spoken output appears to reflect generative language use rather than pure delayed echolalia.

To support functional communication, a low-tech picture-based AAC system was introduced during early speech therapy and continues to be utilized within the school setting. Due to a lack of specific home-tailored materials, the AAC system was not implemented within the domestic environment. The system's monolingual Italian configuration is not reported as a barrier by the family.

B's mother reports that, initially, parents exhibited apprehension regarding potential cognitive confusion resulting from multilingual exposure. At present, however, the parents express support for a multilingual profile, prioritizing Italian

for local integration and English for heritage-family connections, while placing less emphasis on Tagalog acquisition.

Importantly, despite empirical evidence refuting the notion that multilingualism delays developmental trajectories in autistic children, both B.'s first speech therapist and school personnel advised the family to enforce monolingualism in Italian, explicitly discouraging exposure to Tagalog and English.

4.3 M-BLUE assessment

Sections "B" through "G" of the questionnaire were completed by the parents. The mother self-rated her language proficiency as somewhat fluent in Italian (score: 2/5), very fluent in English (score: 4/5), and fully fluent in Tagalog (score: 5/5), which constitutes her native language. In terms of weekly direct contact with B., the mother provides 25 hours per week of Italian exposure during weekdays and 18 hours during weekends; 10 hours per week of English during weekdays and 5 to 6 hours during weekends; and 10 hours per week of Tagalog during weekdays alongside 5 hours during Saturday and Sunday.

The father self-rated as fully fluent in Italian (score: 5/5), having lived in Italy since a young age, as well as fairly fluent in both English (score: 3/5) and Tagalog (score: 3/5). He communicates with B. in Italian for 10 hours per week during weekdays, and 16 hours during Saturdays and Sundays. The father provides 7 hours per week of English exposure, while only 5 hours during weekends. He also speaks Tagalog for less than 5 hours Monday to Friday and 16 hours across Saturdays and Sundays.

In the school setting, B. receives between 34.1 and 40 hours per week of linguistic contact in Italian, alongside one hour per week in English. Outside of the immediate and extended family, B. receives no contact in Tagalog.

B. interacts with his brother and sister for 25 hours per week during weekdays and 26 hours across Saturday and Sunday. In these sibling interactions, communication occurs interchangeably in both English and Italian throughout the

day; consequently, the mother was unable to specify the exact hourly breakdown per language. Additional language exposure includes contact with grandparents, whose primary language is Tagalog, for 1 hour during weekdays and 1 hour during weekends, delivered in Italian and English. Interpersonal contact with aunts, uncles, and cousins (whose primary language is Italian) occurs in English or Italian for 1 to 2 hours during weekdays and an equivalent duration during weekends. Furthermore, B. attends weekly swimming lessons conducting 1 hour of instruction in Italian, as well as 2 to 3 hours per week (including weekends) of cultural community activities involving individuals whose primary languages are Tagalog, English, and Italian, where communication takes place in English or Italian.

Regarding Section “F”, B. demonstrates a preference for using Italian and English with all family members, while exclusively preferring Italian with friends at school.

Finally, media exposure patterns reveal a heavy English dominance within the household. The family engages in approximately 20 hours per week of television programming in English, 6 hours of English-language movies, 5 hours per week of English radio broadcasts, and 24 hours per week of other English multimedia content. Occasionally, they watch Tagalog video content for approximately 3 hours per week. Literacy activities include the mother reading to B. in Italian for approximately 2 hours per week, alongside B. independently reading to himself in Italian for approximately 2 hours per week.

4.4 Speech analysis

A 28-minute video recording was conducted during a child-led, play-based speech therapy session, representing the second encounter between B. and the therapist. The primary activities involved playing with colourful plastic bath animals and blowing bubbles. During the session, B. attempted to express himself and when experienced a communication breakdown with the therapist,

he spontaneously resorted to graphic communication, tracing letters onto a foam floor mat with his finger. Recognizing this communicative bid, the therapist provided paper and coloured pencils, which B. used to write sequences corresponding to three distinct scripts: Italian, English, and Cyrillic.

Quantitative analysis of the 28-minute transcription yielded a total of 132 verbal and vocal utterances across five language categories (Italian, English, Russian, Tagalog, and Unidentified) and eight pragmatic functions, detailed in the table below (Table 5):

Pragmatic Analysis B						
	English	Italian	Russian	Tagalog	Unidentified	Total
Request	8	16		3		27
Interaction	1	35			13	49
Answer	2	1				3
Initiating		1			2	3
Echolalia		2				2
Private-speech	5	4	7		1	17
Communicative Echolalia		4				4
Undetected					27	27
Total	16	63	7	3	43	132
Total %	12%	48%	5%	2%	33%	100%

Table 5

As shown in Figure 3, Italian served as the primary language during the session, accounting for 47.7% ($n = 63$) of all recorded utterances. English accounted for 12.1% ($n = 16$) of overall productions, utilized primarily for requests ($n = 8$) and private speech ($n = 5$). A substantial proportion of utterances (32.6%, $n = 43$) could not be linguistically identified due to low volume, articulatory imprecision, or idiosyncratic jargon. Russian accounted for 5.3% ($n = 7$) of total

output, occurring exclusively within private speech routines focused on naming or reciting letter names while drawing Cyrillic characters. Tagalog comprised 2.3% (n = 3) of utterances, appearing solely in requestive contexts. Specifically, B. repeated the word "*lobo*" three times while playing with bubbles, although with a different pronunciation each time. Initially the utterance was unintelligible to the clinician but was subsequently identified by the mother during video-review as the Tagalog word for "balloon" or "bubble."

Pragmatically, the predominant communicative function was Interaction (37,1%, n = 49), followed by Requests (20,5%, n = 27) and Private Speech (12,9%, n = 17). The Undetected category (20,05%, n=7) comprised utterances with unclear intentionality or mumbled execution. Other functions included Answers (n = 3), initiating turns (n = 3), communicative echolalia (n = 4), and non-communicative echolalia (n = 2).

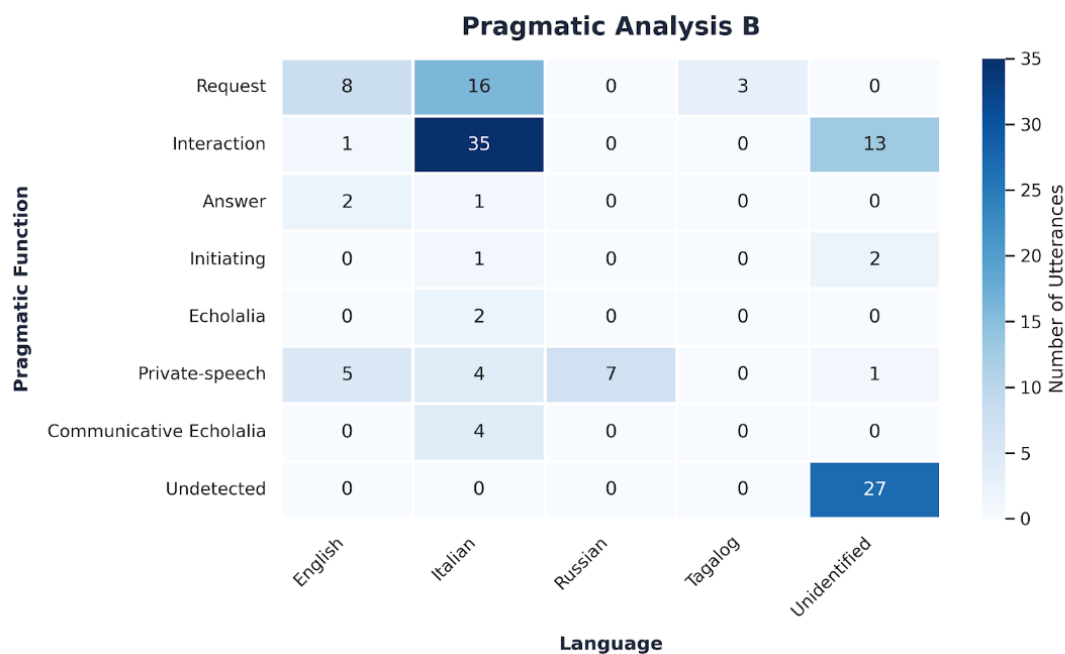


Figure 3. Heatmap of utterance distribution across pragmatic functions and language choices for Case B.

Lexical classification presented substantial analytical challenges due to reduced intelligibility, articulatory variations, and frequent code-mixing during the

session. The 136 lexical tokens identified across the transcription were categorized by grammatical/functional class, as summarized in the table below (Table 6):

Lexical Analisy B	
Nouns	28
Adjectives	11
Verbs	4
Letters/Alphabets	50
Other	43

Table 6

As illustrated in Figure 4, tokens classified under Letters/Alphabets ($n = 50$) and "Other" ($n = 43$) constituted the most frequently produced categories, followed by Nouns ($n = 28$), Adjectives ($n = 11$) and Verbs ($n = 4$).

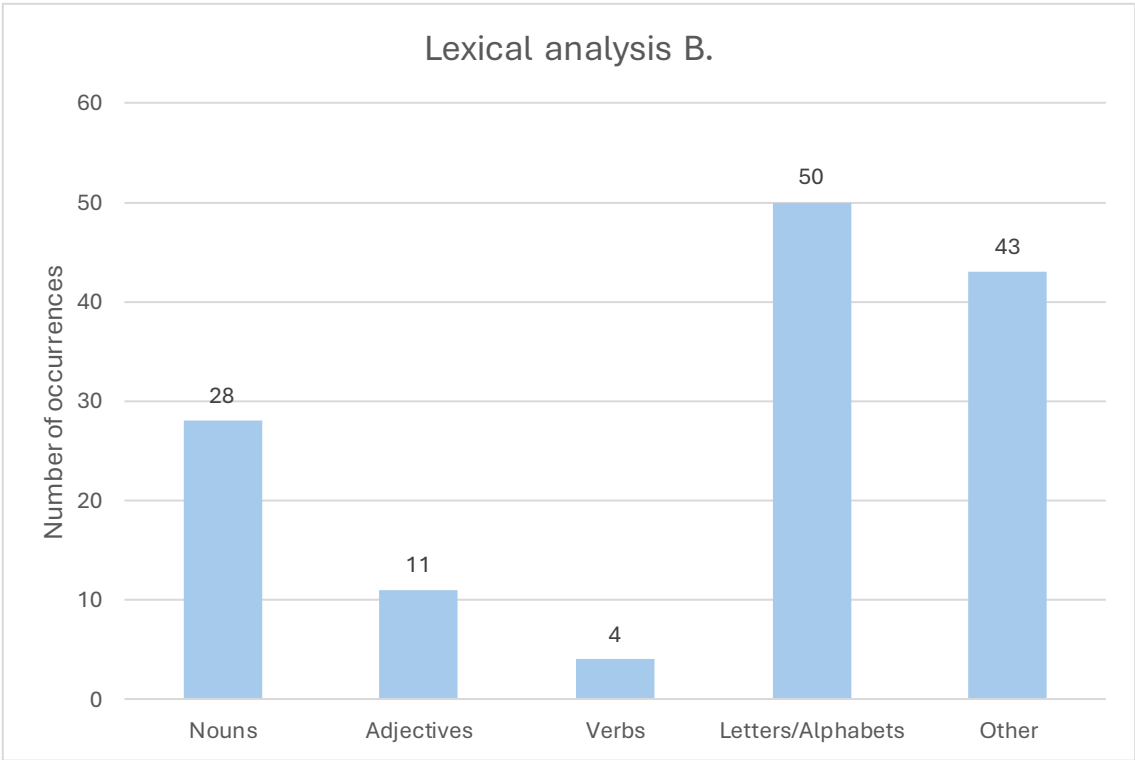


Figure 4. Distribution of lexical items for Case B across categories

Differentiating tokens by target language was frequently complicated by cross-linguistic phonetic overlaps in letter naming between Italian, English, and Cyrillic scripts. Despite these classification challenges, an effort was made to provide a detailed analysis of each grammatical class. Verbal output was restricted to a single Italian infinitive, “*mangiare*” (“to eat”), produced four times. Of the 28 nominal tokens, 24 occurred in Italian (colour labels were subsumed under this category due to their functional usage during play). Tagalog accounted for three nominal tokens (*lobo*, “bubble/balloon”), while one token corresponded to B.’s family surname. Adjectival output (n = 11) was exclusively English, consisting of contrastive dimensional descriptors: *big* (n = 5) and *small* (n = 6). Regarding the Alphabet Items (n = 50), B. named letters and recited alphabet, drawing from Italian, English and Russian. The category “Other” (n = 43) encompassed affirmative and negative markers (*sì*, *no*), Italian functional onomatopoeia (*gnam-gnam* for eating), and four highly ambiguous verbal sequences:

/kaw/ (“cow”): produced during letter-tracing rather than in a semantic context related to animals, rendering its communicative intent unclear.

/rize/ (“rise”): uttered repeatedly while the clinician feigned sleep, shortly before B. produced the Italian word *luna* (“moon”). This temporal sequence suggests a potential orthographic or semantic attempt to invoke the English verb *rise*.

/su-pare/: appeared to represent non-segmentable jargon speech.

/tʃatz/ (“chatz”): exhibited variable phonological articulation throughout the interaction. A plausible sociolinguistic interpretation links this production to the colloquial Russian temporal adverb *сейчас* (/sʲɪˈtʃas/ short form /ɕ.as/, meaning “now”), as it occurred systematically while B. waited for the clinician to blow bubbles.

A particularly compelling finding concerns B.’s spontaneous, graphic productions during the session, illustrating inter-lingual transfer. First, while vocalizing the English adjective “*big*” out loud, B. wrote the sequence БН Г. The outer graphemes Б (/b/) and Г (/g/) belong to the Cyrillic alphabet. Given that B.

systematically substituted the Latin letter N for the Cyrillic И (/i/) throughout the session, the intended graphic string aligns with БИГ, a phonetically accurate Cyrillic transliteration of the English word /big/. Later on, B. produced the Cyrillic-like string CXPНHK. Applying the same graphemic substitution rule (N for И), this sequence renders as CXПИHK, closely mirroring the phonological articulation of the English verb *shrink*. Remarkably, when the clinician pointed to the written string and asked for clarification, B. repeatedly pointed to the text and responded "*small*", possibly alluding to a semantic association between *shrink* and *small*.

4.5 Discussion

Language distribution within the video-recorded session may suggest a functional specialization. Italian emerged as the dominant communicative language, utilized primarily to sustain interpersonal interactions, whereas English served predominantly requestive functions. Russian occurred exclusively within private speech routines, and Tagalog was restricted to a specific request for bubbles (*lobo*).

Despite marked emotional and motor dysregulation, B. demonstrates a clear communicative orientation toward the clinician. His communicative style is predominantly interactive and requestive. Lexically, Italian exhibits greater structural variety and frequency, encompassing nouns, verbs, and conversational markers (e.g., *si*, *no*), while English output features descriptive adjectives (*big*, *small*) and nominal items, though lacking verbal forms. Russian productions remain tied to letter names, Cyrillic script recitations, and the potential temporal adverb *чac* ("now"). Tagalog is limited to the articulation of *lobo*.

A core finding of this analysis is B.'s reliance on multimodal communicative channels, spanning to vocal and graphic modalities. Given his primary environmental exposure to Italian, English, and Tagalog, his spontaneous engagement with the Cyrillic script may represent a salient manifestation of Unexpected Bilingualism (UB). This clinical observation directly mirrors the

findings from the parental semi-structured interview, in which the mother reported B.'s spontaneous production of Russian lexical items during solitary pretend play with toys.

B.'s affinity for written graphemes and subtitles, when watching YouTube videos, constitutes an important entry point for his language acquisition. As corroborated by maternal report, B. routinely enables subtitles on digital devices, simultaneously echoing the auditory input and transcribing text onto paper, the exact mechanism through which he independently acquired the Russian alphabet.

This behavioural pattern was further highlighted by a naturalistic clinical observation following the therapy session: while waiting alongside his mother, B. was observed actively reading the textual description under a YouTube video on a mobile device.

Far from assuming exceptional savant-like abilities or over-interpreting the data, a cautious reading of these patterns suggests that graphical output may represent a spontaneous attempt to map oral language across writing systems. This hypothesis is further supported by the curious instance of B.'s Cyrillic writings, which resemble the phonetic representation of English words.

5. Case C

C. is a seven-year-old boy, an only child born in Italy to Sri Lankan parents. He resides with his family in the province of Venice. He is an affectionate, energetic, and happy child. He enjoys playing with other children, running games like tag, and engaging in pretend play where he often acts like cartoon characters. He loves the pool and attends swimming lessons once a week.

At the age of three, he started attending the local school and is currently enrolled in the second grade of primary school. Outside of school, alongside his swimming lessons, his therapy program consists of approximately two hours of weekly treatment: fifty minutes of speech therapy and fifty minutes of occupational therapy. Starting in September 2026, the occupational therapy service transitioned into a small-group therapy format with a child of the same age, conducted jointly by the speech therapist and occupational therapist.

5.1 Clinical Background and Diagnostic Profile

At three years of age, C. received a formal diagnosis of Pervasive Developmental Disorder, Unspecified (F84.9 according to ICD-10 criteria, corresponding to Autism Spectrum Disorder). Standardized evaluation via the ADOS-2 yielded a profile consistent with Autism Spectrum Disorder across both the Communication and Social Interaction domains, as well as Restricted and Repetitive Behaviours.

Initial clinical documentation noted limited communicative intentionality, which was restricted predominantly to requestive functions. Verbal abilities were restricted to intelligible single-word productions, almost exclusively in English, occasionally combined with pointing gestures. Receptive language was effective predominantly when supported by contextualized communication, with major comprehension observed in English compared to Italian. He demonstrated a marked preference for proprioceptive, tactile, and vestibular motor-input. He displayed a strictly solitary play, marked by active avoidance of peer and adult

proximity. Standardized psychometric assessment was not feasible due to attentional deficits and non-compliance.

At the time of the present study, C exhibits significant developmental progression in social engagement, demonstrating an active, prosocial orientation toward both peers and adults. Receptive comprehension remains stronger in English than in Italian, though overall comprehension efficiency continues to be constrained by attentional dysregulation. Expressively, C has transitioned from single-word utterances to multi-word sentence structures, though these remain predominantly short.

His expressive repertoire relies heavily on echoed language chunks derived from cartoons; notably, however, these scripted utterances are deployed functionally to establish social connections and convey communicative intent. Interestingly, despite predominant daily immersion in Italian through school attendance, C is only now beginning to produce emerging Italian words and occasional short phrases.

Phonetically and prosodically, his verbal output is characterized by tachylalia and sporadic jargon speech. Articulatory precision is variable, rendering his speech occasionally unintelligible to unfamiliar listeners, particularly during imaginative play when enacting cartoon characters. Attentional difficulties remain a persistent clinical feature.

5.2 Semi-Structured Parental Interview

C's mother and father migrated to Italy from Sri Lanka in 2016. Between the parents, communication occurs in Tamil and English. Prior to C's diagnosis, parental input was divided, with the mother speaking English to him and the father employing both English and Tamil. Following the diagnostic process, both parents adopted a bilingual approach, using English and Tamil within the domestic sphere. English functions as the primary vehicle for daily domestic interactions, whereas Italian is integrated out of practical necessity due to

residence in Italy and educational requirements. The mother's choice of English over Tamil is because English is an international language, providing the ability to communicate anywhere.

C is immersed in an Italian-dominant social environment through his primary school, peer interactions, swimming lessons, occupational therapy, and speech-language therapy. However, micro-adjustments in language input are present: his elementary school teacher possesses foundational English skills and selectively utilizes English to scaffold communication when necessary. Similarly, during speech-language therapy, the clinician employs English to facilitate comprehension, increase task compliance, and foster rapport.

Domestic literacy and routine practices reflect distinct language choices: parent-child book reading is conducted in Italian, driven by locally acquired reading materials, whereas singing and lullaby routines are performed exclusively in English. Evaluated on receptive competence, both parents identify English as C's strongest language of comprehension.

Digital media constitutes a prominent source of language input in C's routine, with daily phone and tablet usage estimated at two to three hours. His content preferences centre on educational videos, children's songs, and animated series, with a particular affinity for *Mickey Mouse* and *Lego* media content. C exclusively selects English-language programming. Screen time is characterized by active repetition, immediate echolalia, and enactments of scenes from the screen.

Expressively, English remains C's preferred and primary mode of communication. A functional differentiation in language choice is observed across communicative intents: while requestive functions are expressed in both Italian and English, higher-level social communication, such as sharing interest, narrative recounting, and self-directed private speech, is conducted almost exclusively in English.

Parents state that C demonstrates pragmatic code-switching behaviour, conditioned by sociolinguistic context and listener characteristics; although this ability seems to be deployed only during greeting routines as he alters his

linguistic choices based on the interlocutor; parent reports note that he spontaneously employs culturally specific greetings when encountering members of the Muslim community, while utilizing Italian or English greetings with individuals from other background communities.

Over time, a gradual shift toward Italian has emerged. While his early expressive profile was restricted to English, he is progressively incorporating more Italian into his daily repertoire. C's mother noticed that the shifting initiated as he started elementary school.

Regarding echolalic structures, the parents report a dual presence of static repetitions from animated media alongside functionally deployed echolalia used adaptively for real-time communication.

To support functional communication, a low-tech picture-based AAC system configured in Italian was implemented within the school environment. The system is not utilized in the household. The parents express no concern regarding the monolingual Italian setup of the AAC tool.

Parental attitudes toward multilingualism are markedly positive and additive. The parents do not express apprehension regarding potential cognitive or linguistic overload from multi-input exposure. Instead, they prioritize heritage language maintenance alongside societal language acquisition, viewing Tamil as essential for sustaining familial and cultural ties with relatives in Sri Lanka. At this regard, the mother states that they sometimes speak in Tamil in front of C and they speak to their family in Sri Lanka via video-call.

Clinically, the guidance received by the family differs notably from standard strict monolingual recommendations: healthcare professionals explicitly advised the parents to maintain active, continuous exposure to both Italian and Tamil.

5.3 M-BLUE assessment

In the M-BLUE questionnaire, the mother self-rated her language proficiency as fairly fluent (3) in Italian (the majority language) and fully fluent (5) in both English

and Tamil. She reported having direct contact with C. in Italian for less than 5 hours per week, with little to no contact during weekends. Conversely, she reported over 40 hours of direct English contact per week, including weekends. Regarding Tamil, she reported only minimal contact ("a little") throughout the week and weekends.

The father self-rated his proficiency as very fluent (4) in Italian and fully fluent (5) in both English and Tamil. He reported high exposure levels for both Italian and English, exceeding 40 hours per week for each language across weekdays and weekends, alongside minimal contact in Tamil.

At school, C. receives 40 hours of weekly Italian exposure and less than 5 hours of English exposure. During weekends, he engages in 1–2 hours of peer play with friends who speak both Italian and English. In swimming lessons, the instructor primarily uses Italian, occasionally resorting to English to facilitate better communication.

In terms of language preference, C. prefers to express himself in English with both parents, while using a combination of English and Italian with friends, teachers, and therapists. During family activities, media consumption (television) is conducted in English and occasionally in Italian. Book-reading sessions with both parents occur in English alongside Italian, as C. does not yet read independently.

5.4 Speech analysis

During the 43-minute video recording, C. asks to play "pizzeria." A pretend play activity is then initiated, in which a pizzeria is constructed using materials available in the room (large soft foam blocks, a large mat, etc.). C. demonstrates excellent pretend play skills. During play, however, he tends to immerse himself entirely in character role-play, occasionally displaying reduced receptivity to external social initiation. After a while, interacting with the therapist, C. asks to "go see his swimming pool"; the pretend play scenario thus shifts from the

pizzeria to the swimming pool. During the session, the play was interrupted by one of the centre's therapists entering the room to pick up a toy; C. addressed her in Italian in a context-appropriate manner.

The pragmatic analysis of C.'s spontaneous speech produced the results shown in the table below (Table 7):

Pragmatic Analysis C					
	English	Italian	Code-Mixing	Unidentified	Total
Request	12	21			33
Interaction	88	33	1	2	124
Answer	30	51	3	2	86
Initiating	4				4
Echolalia	8	8	1		17
Private-speech	114	9		1	124
Communicative Echolalia	17	10			27
Undetected	2			36	38
Total	275	132	5	41	453
Total %	61%	29%	1%	9%	100%

Table 7

As shown in Figure 5, total of 453 utterances were recorded during the session. The pragmatic analysis revealed that Interaction and Private Speech were the two most frequent functional categories, each accounting for 27.37% of the total production ($n = 124$ each). Answers represented 18.98% ($n = 86$), followed by Requests ($n = 33$, 7.28%), Communicative Echolalia ($n = 27$, 5.96%), and Echolalia ($n = 17$, 3.75%). Initiating utterances were minimal, accounting for less than 1% ($n = 4$). A remaining portion of utterances was classified as Undetected ($n = 38$, 8.39%).

In terms of language distribution, English was the predominant language used, comprising 60.71% of all utterances (n = 275). Within English production, Private Speech constituted the largest category (n = 114), followed by Interaction (n = 88), Answers (n = 30), Communicative Echolalia (n = 17), Requests (n = 12), Echolalia (n = 8), Initiating (n = 4), and Undetected (n = 2).

Italian represented 29.14% of total speech production (n = 132); it was primarily utilized for Answers (n = 51) and Interaction (n = 33), followed by Requests (n = 21), Communicative Echolalia (n = 10), Private Speech (n = 9), and Echolalia (n = 8).

Code-mixing occurred in 5 instances (1%), distributed across Answers (n = 3), Interaction (n = 1), and Echolalia (n = 1). Finally, 41 utterances (9%) were classified as Unidentified, consisting mainly of Undetected vocalizations (n = 36), along with small occurrences in Answers (n = 2), Interaction (n = 2), and Private Speech (n = 1).

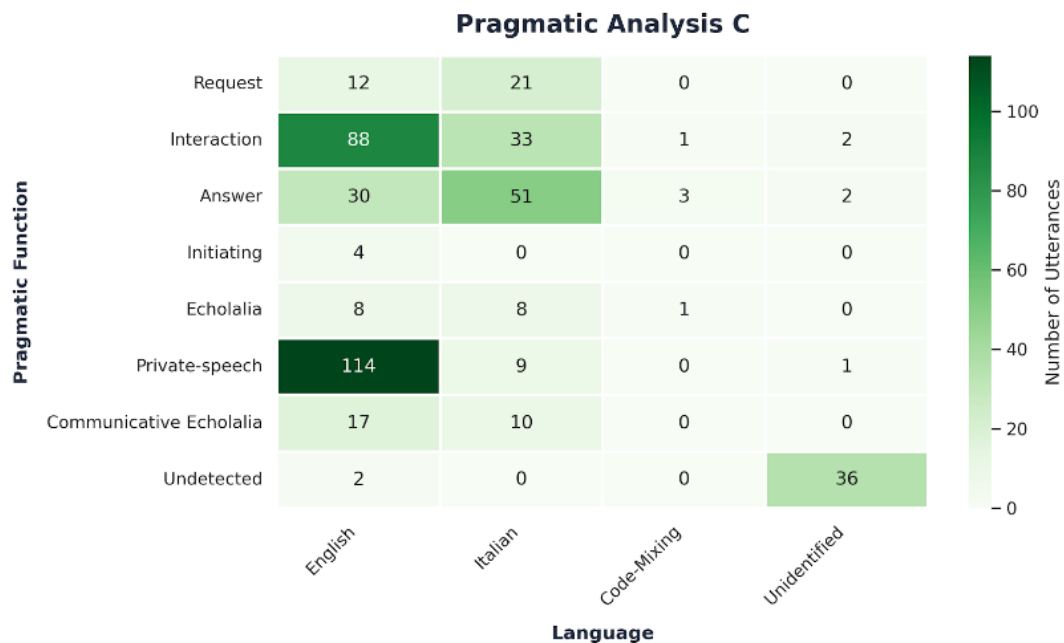


Figure 5. Heatmap of utterance distribution across pragmatic functions and language choices for Case C.

Table 8 summarizes the findings of the lexical analysis.

Lexical Analysis C.								
	Italian		English		Unidentified		Total	
	Token	Types	Token	Types	Token	Types	Total token	Total types
Nouns/ Names	83	39	103	51	2	2	188	92
Verbs	29	16	171	53			200	69
Adjectives	12	8	22	15			34	23
Adverbs	8	6	33	14			41	20
Numbers	1	1	5	2			6	3
Other	51	15	286	44	112	18	449	77
Letters/ Alphabet	0	0	0	0	0	0	0	0

Table 8

A total of 918 total words (tokens), corresponding to 284 distinct lexical types, were produced by C. Words classified as "unintelligible," "mumbles," or "inaudible" were excluded from this analysis as they were not suitable for lexical categorization.

As illustrated in Figure 6, the most frequently produced overall category was Other, which encompassed functional language items such as pronouns, determiners, conjunctions, and exclamations, alongside incomplete phonetic attempts and unidentifiable word targets. An effort was made to differentiate this category into *Other English*, *Other Italian*, and language-neutral *Other*. The language-neutral *Other* category (112 tokens, 18 types) primarily included exclamations not strictly attributable to either language (e.g., "oh-no"). These expressions were retained in the lexical count as they serve as meaningful indicators of C.'s communicative and pragmatic competence. The most

prominent subcategory within *Other* was *Other English*, accounting for 286 tokens and 44 types, which largely consisted of articles and pronouns. By contrast, *Other Italian* comprised 51 tokens across 15 types.

The second most frequent category was English verbs, accounting for 171 tokens across 53 different types. In comparison, Italian verbs accounted for only 29 tokens across 16 types.

Regarding nominal expressions, English nouns comprised 103 tokens (51 types), whereas Italian nouns accounted for 83 tokens (39 types). Additionally, 2 proper names (2 tokens, 2 types) were produced, corresponding to C.'s own name and the therapist's name.

Adjectives and adverbs followed a similar pattern of English dominance: 22 English adjective tokens (15 types) were produced compared to 12 Italian adjective tokens (8 types). For adverbs, 33 English tokens (14 types) were recorded versus 8 Italian tokens (6 types).

Finally, a total of 6 numbers were produced across both languages (5 English tokens, 2 types; 1 Italian token, 1 type). Importantly, these numbers were not produced as a mechanical self-regulatory counting routine, but were utilized in a functional, communicatively context during play.

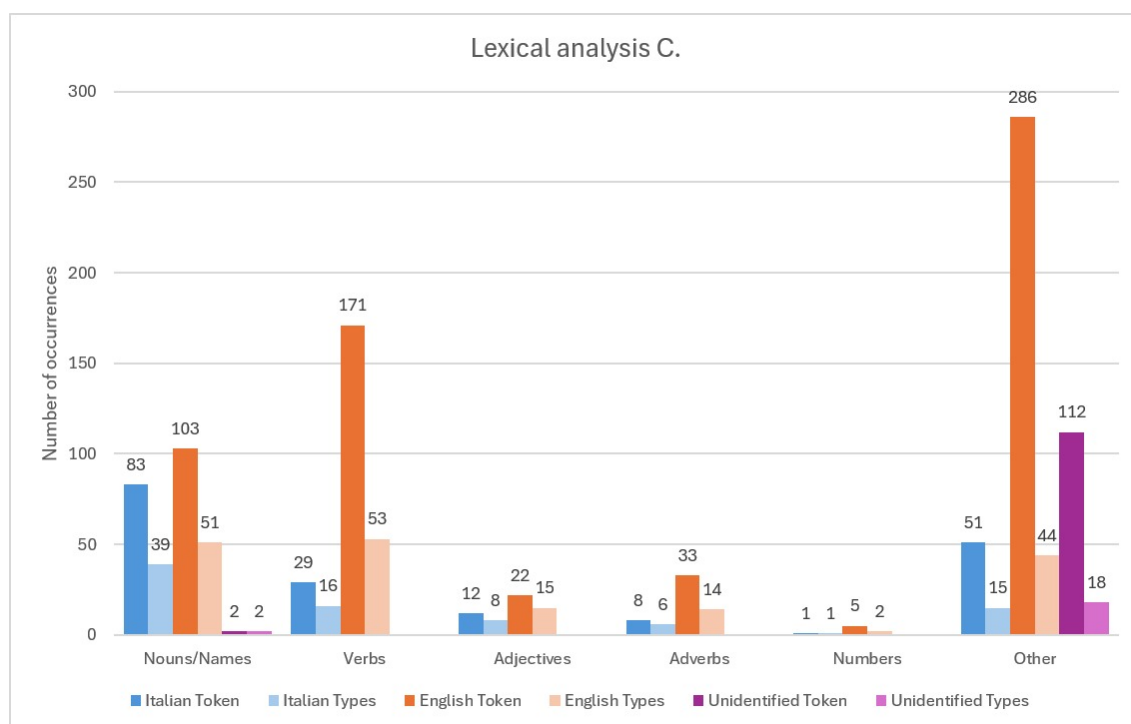


Figure 6. Distribution of lexical items for Case C across languages.

5.5 Discussion

English was the most utilized language overall, serving as C.'s first language. Nevertheless, Italian was predominantly employed to answer questions and to formulate requests. This functional distribution demonstrates not only an improvement in C.'s Italian linguistic competence, but also an emergent pragmatic ability to code-switch based on communicative function: more predictable exchanges, such as answering a direct question or making a request, appear to elicit Italian more readily than spontaneous interaction, which still relies primarily on English. Indeed, English was mainly employed during private speech to guide his play, self-regulate, and organize ongoing activities.

The numerical equivalence between Private Speech ($n = 124$, 27.37%) and Interaction ($n = 124$, 27.37%) provides key insights into C.'s cognitive-linguistic profile and communicative style during pretend play. This symmetrical distribution highlights the dual function of speech during complex pretend play scenarios (such as the pizzeria and swimming pool play contexts). While interactive speech was sustained to maintain social engagement with the clinician, an equal amount of private speech was required to support self-regulation, narrative structuring, and cognitive organization within the play domain. As noted during observation, C. becomes highly immersed in play scenarios; private speech serves as an essential tool to guide his own actions and sustain internal play scripts. Although not substantial, communicative echolalia represented 6% of the overall speech production ($n = 27$). Taken together with the high proportion of private speech, this finding shows that C. remains strongly reliant on linguistic scripts to process and structure his verbal output. Moreover, one of the most remarkable aspects of C.'s linguistic profile lies in his prosody and phonological accent. Indeed, C. often exhibits a distinct American English pronunciation. This stylistic feature is particularly noteworthy given that no member of his immediate family originates from North America; his mother chose to speak English with him primarily to provide a global, international language rather than a native or heritage language. Furthermore, C.'s prosody frequently mirrors the stylized intonation patterns

characteristic of animated media, at times closely resembling the vocal style of characters such as Mickey Mouse.

As reported by his mother, C. regularly recreates episodes from his favourite YouTube cartoons in daily life routines. This behavioural pattern was directly observed during the pretend play session: while organizing the pizzeria scenario, C. exclaimed, *"I'll call our friends,"* referencing a Thanksgiving dinner invitation script, and later explicitly brought the character Minnie into the play narrative. These elements underscore how media-derived scripts serve as foundation for C.'s imaginative play and spontaneous verbal routines.

A total of 5 tokens (3 distinct types) of code-mixing were detected during the session, spanning three different functional and structural modalities. First, phonological hybridization and lexical blending were observed twice when C. produced the form *"straberra"* while attempting to denominate a strawberry in Italian (*fragola*), merging the English root (*strawberry*) with an Italian-like phonological ending. Second, a phonetic approximation occurred when C. produced the form *"forca"* while trying to label a fork (*forchetta*) in Italian. Finally, code-mixing insertions were identified when C. repeated the sentence *"I forgot borraccia"* twice, seamlessly inserting a specific Italian noun (*borraccia*, meaning *water bottle*) into an English syntactic frame (*"I forgot..."*). These instances demonstrate how C.'s code-mixing operates both at the lexical and morphological level and at the syntactic level through insertion.

The lexical analysis shows how C. employs a rich variety of terms spanning diverse grammatical categories. Although occasional errors occur, C. is generally accurate in his deployment of adverbs, pronouns, and verbal structures. Notably, he exhibits an advanced grasp of morphosyntactic contractions in English, correctly using reduced forms such as *"'ll"* for the future auxiliary *will* (e.g., *"I'll"*) and *"'ve"* for *have*. This indicates that his language production is not restricted to simple labelling or object nomination; rather, he utilizes language functionally to describe his surrounding reality and actively operate upon the world, as evidenced by the high diversity and frequency of verb forms.

A cross-linguistic comparison of his lexical distribution reveals compelling differences between the two grammatical classes of nouns and verbs. Although English speech production was higher overall, nominal occurrences were approximately balanced between the two languages. Italian nouns accounted for 9.04% (n = 83 tokens) of total lexical production, whereas English nouns represented 11.22% (n = 103 tokens). Conversely, the verbal category exhibited a striking disparity. English verbs accounted for 18.63% (n = 171 tokens across 53 types), whereas Italian verbs represented only 3.16% (n = 29 tokens across 16 types). This sharp contrast may suggest that while C. possesses a solid bilingual inventory for concrete referents (nouns), his functional framework for actions and narrative generation relies predominantly on his primary language, English.

6. Discussion and limitations

6.1 General discussion

The qualitative and quantitative analysis of semi-naturalistic language samples, united to the semi-structured interviews and questionnaires gave a rich understanding of the three children's language development. Despite the small number of participants and the lack of previous analysed samples, the collected data permit an in-depth analysis.

In the next section the three case studies will be discussed following the structure of chapter 1 for a better understanding.

6.1.1 Stakeholder and social perspectives

To the best of the author's knowledge, immigrant parents' perspectives on bilingualism in Italy have received little, if any, attention in the existing literature. Consistent with previous research conducted in other countries, two families reported initial concerns about raising their children bilingually. These concerns are particularly noteworthy because both families had been advised by speech and language therapists or school professionals to limit their children's exposure to more than one language. Similar recommendations have been documented in different national contexts (e.g. Lim et al. 2025; Rasheed, Tiwari, e Padickaparambil 2025). At the same time, all three families considered the maintenance of the heritage language, or, in B.'s case, the language most frequently used by members of the extended family, highly important. This finding is in line with previous studies highlighting the role of heritage-language maintenance in family communication and relationships (e.g. Howard, Gibson, and Katsos 2024; Jegatheesan 2011; Lim et al. 2025). However, parents' positive attitudes towards heritage-language maintenance did not always correspond to their reported language practices. When compared with the M-BLUE responses, the data indicate that B.'s and C.'s parents used their native languages less frequently with their children than other languages in their repertoires. In A.'s

case, the reported exposure data were more difficult to interpret and appeared internally inconsistent. The family reported a similar amount of weekly exposure to Italian and Albanian, although the information collected in the interview suggested that such a distribution was unlikely to reflect the child's actual direct exposure. Rather than treating this inconsistency as a simple reporting error, it may be understood as an indication of the complexity of the family's linguistic decision-making. The mother appeared to be negotiating several factors: her wish to maintain Albanian, the practical demands of everyday family life, the child's language difficulties, and the advice received from school and clinical professionals. The apparent discrepancy between reported beliefs and language practices may therefore reflect the difficulty of translating positive attitudes towards bilingualism into everyday language use; therefore, the bilingual environment should not be understood as a static or fixed condition, but rather as a dynamic practise (Yu 2013).

Another important issue concerns the limited availability of assessment materials to evaluate the language abilities of autistic bilingual children. As noted by Davis, Zaki, and Sargent (2024), many existing tools are designed for monolingual or typically developing populations and may therefore fail to capture the complexity of multilingual autistic language development. This problem may lead to an inaccurate assessment of children's abilities, as happened to A., particularly when only one language is evaluated. An additional concern is that some professionals continue to advise families against raising their autistic children bilingually, despite the growing body of evidence indicating that multilingual exposure is not detrimental to language development. Particularly within the Italian context, this discrepancy between empirical evidence and professional guidance needs to be further investigated.

6.1.2 Language development

As previously discussed, current research does not support the claim that bilingual exposure hinders language development in autistic children. Moreover,

the cases of A. and C. might suggest that exposure to, and use of, English may have functioned as a bridge towards the development of Italian. According to A.'s clinical records and his mother's report, his preferred language gradually shifted from English to Italian. Nonetheless, English remains available as a lexical retrieval strategy, particularly when he experiences difficulties retrieving an Italian word.

A comparable developmental shift can be observed in C.'s profile. Indeed, while his early expressive language was almost exclusively English, he has gradually begun to use Italian, particularly in interactions with Italian-speaking interlocutors. His current language practices therefore indicate an increasing ability in language use. Taken together, these cases suggest that the use of English did not prevent the development of Italian; rather, English may have provided an important communicative and developmental resource during the children's linguistic trajectories. This developmental shift is also reflected in the lexical and pragmatic analyses of the video-recorded sessions. These analyses make it possible to move beyond the children's overall language preferences and examine how Italian and English were distributed across lexical categories and communicative functions. In this way, language development can be understood not only in terms of the amount of speech produced in each language, but also in terms of the communicative purposes and linguistic resources associated with each language.

In A.'s case, the predominance of Italian in the recording is particularly clear: Italian accounted for 85% of the utterances, whereas English represented only 3%. Italian was used across a wider range of communicative functions, including interaction, answering, requesting, and initiating. English, by contrast, occurred only sporadically and was mainly used as a lexical retrieval resource when A. experienced difficulty accessing an Italian word. The lexical analysis points in the same direction. Italian was used for nouns, verbs, adjectives, adverbs, and functional items, while English productions were largely restricted to nouns. Importantly, A.'s production included a relatively broad range of lexical categories

and a considerable number of word types. Although these findings cannot establish the presence of a fully developed grammatical system, they suggest that his language was not limited to a small set of isolated labels. Instead, his output included productive lexical and morphological variation, consistent with the possibility that language development can continue beyond the early preschool period in some autistic children. This interpretation is compatible with longitudinal research showing that language development in autism is heterogeneous and that some autistic children continue to acquire verbal language after the age of five or six (Brignell et al. 2018).

C's profile is characterised by a predominance of English with 61% of the utterances, while Italian represented 29% of his production. Interestingly, Italian was more frequent in answers and requests, whereas English was especially prominent in private speech and pretend-play routines. This may be interpreted as an emergent ability to code-switch based on the interlocutor language choice. This finding is in line with Crockford, Gibson, and Katsos (2025) and Maes et al. (2026). The lexical analysis further showed that English was used across a wide range of grammatical categories, particularly verbs and functional items, while Italian nouns were relatively comparable in frequency to English nouns. Longitudinal follow-up would be valuable to determine whether other Italian grammatical categories gradually expand.

The analysis of B. shows a complex picture. His language displays a predominance of Italian and English. Importantly, the Russian language emerges as private-speech and as a tool to self-regulate and guide his actions while writing. His speech was largely characterised by single-word productions, and letters represented a substantial proportion of his lexical output, in line with his special interest in letters, numbers and colours. Although B.'s spoken lexical repertoire was relatively restricted, the pragmatic analysis showed that interaction was the most frequent communicative function, accounting for 37% of the identified utterances, followed by requests and private speech. These findings suggest that limited spoken production should not be equated with limited

communicative participation. Indeed, during the session, B. showed a brilliant strategy to communicate: he traced letters in the air and subsequently wrote words with his finger when paper and crayons were provided. His communicative repertoire therefore extended beyond speech and included vocal, graphic, gestural, and multimodal resources.

This observation highlights the importance of analysing autistic children's language development beyond spoken language alone. In B.'s case, writing and alphabetic knowledge appeared to provide alternative channels to express linguistic knowledge and communicative intentions. According to recent literature, this kind of production should not be interpreted solely through the category of "non-verbal" or "minimally verbal". Instead, it suggests the need to examine how language may develop and be expressed across modalities (Bottema-Beutel et al. 2025).

Overall, these cases illustrate the heterogeneous and dynamic nature of bilingual language development in autistic children. They also demonstrate that bilingual competence cannot be evaluated solely through the amount of spoken output in each language, but requires attention to multiple elements, such as communicative functions, lexical distribution, code-switching and writing.

6.1.3 Unexpected Bilingualism

The case of A. shows a salient example of Unexpected Bilingualism. Notably, despite substantial exposure to Albanian within the family environment, A. neither produced nor appeared to understand Albanian, according to his mother. By contrast, English emerged as his preferred language during the earlier stages of development, despite the absence of regular direct interaction in English. Interestingly, his mother reported that A.'s brother was also exposed to English-language videos and digital media but did not develop comparable expressive or receptive abilities in English. Previous literature shows that in typical developing children, the passive use of screen time does not provide the right exposure to

learn a second language (Kuhl, Tsao, and Liu 2003). Although the comparison between A. and his brother is anecdotal, it indicates that media exposure may interact with individual characteristics (e.g. autism), interests, and learning preferences. This finding is in line with previous studies, which highlight the possibility for some autistic children to learn a language from the media (Dumont et al. 2024; Morales et al. 2026; Zhukova et al. 2023). Several explanations have been proposed for this pattern. Screen-based input may provide a relatively stable and repetitive linguistic environment with reduced demands for reciprocal interaction. In addition, a highly preferred topic or activity may increase the child's motivation to attend to the linguistic material. Moreover, some studies have hypothesized that some autistic children might have a better accuracy in pitch discrimination, so that listening to controlled repetitive output from media could help learning a language (Dumont et al. 2024). Additionally, some autistic individuals may have enhanced sensitivity to non-adjacent dependencies (Dumont et al. 2025). Media-derived input may also contribute to the development of accent and prosody. Repeated exposure to the same voices, intonation patterns, and phonetic sequences may help explain why some autistic children's speech resembles the pronunciation of media characters more closely than the accents of the people in their immediate environment (Beccaria, Gagliardi, and Kissine 2025).

Although C.'s profile cannot be classified as a clear case of unexpected bilingualism, since English was also used by his parents in the household, his language profile raises questions concerning the relative contribution of direct and mediated input. Despite attending an Italian-speaking school from the age of three, C. continues to show stronger expressive and receptive abilities in English. More notably, his accent resembles the pronunciation and prosodic patterns of the cartoon characters he frequently watches and imitates. This is quite interesting, given that his parents are not native speakers of English. This observation is consistent with Beccaria, Gagliardi, and Kissine's (2025) findings concerning the possible influence of screen media on autistic children's accents.

C.'s case should therefore be understood as a mixed naturalistic and mediated bilingual trajectory rather than as a prototypical instance of UB. It nevertheless illustrates how media exposure may shape different aspects of language.

B.'s profile provides a different perspective on unexpected bilingualism, particularly because his multilingual development is expressed through both spoken and written modalities. He shows a strong interest in letters, numbers, and different writing systems. During the recorded session, he used the Cyrillic script to represent the pronunciation of words associated with another language, suggesting an attempt to establish correspondences between linguistic sounds and graphic symbols. This pattern is known as hyperlexia and is argued to show primary signs of UB in autistic children (Gagnon, Ostrolenk, and Mottron 2025). Similar the case of B., Ostrolenk et al. (2024) found anecdotal evidence of non-social acquisition of foreign languages and alphabets in minimally verbal children. The authors argue that some children might display an atypical language trajectory and learn to decode written text before they can use oral communicative language; on the contrary typically developing children need to acquire oral language abilities prior to reading through explicit teaching (Rayner et al. 2001). Additionally, Ostrolenk et al. (2024) show that the intensity of interest in letters displayed by some autistic children can result in the very early emergence of reading skills. Crucially, as in the case of B., this interest develops regardless of the children's level of oral communicative language and it might contribute to the future development of oral language (Mottron, Ostrolenk, and Gagnon 2021; Ostrolenk et al. 2024). Interestingly, B.'s interest in written input is outlined by his use of subtitles during media consumption.

This may indicate that his ability to understand and learn language might be triggered by written, structured language. As proposed by Mottron, Ostrolenk, and Gagnon (2021), some autistic children may be particularly responsive to structured linguistic information, including written forms.

B.'s interest in languages is also notable for its breadth. Indeed, B. is curious about different linguistic families including English, Russian, French, German,

and Korean. Media-related languages were primarily observed in solitary play and private speech, whereas Italian and English were more consistently used in interpersonal communication. This distribution suggests that B.'s linguistic repertoire was functionally differentiated: some languages were associated with play and self-directed activities, while others supported interaction with caregivers and clinicians.

Across all three cases, media exposure influenced their language, although with different roles. In A.'s case, English emerged as the first expressive language, despite it was not the language spoken in his environment. In B.'s case, multilingual media content appeared to be associated with alphabetic knowledge, writing, and private speech. In C.'s case, media exposure influenced accent, prosody, scripted language, and pretend-play routines. These findings call for a better understanding of media device for autistic individuals. Screen use may have different effects depending on a diverse number of variants. These findings should not be interpreted as evidence that unrestricted screen exposure automatically promotes language acquisition. At the same time, it is important to understand how helpful devices could be for the language development of some autistic children (Ophir et al. 2023).

6.2 Limitations and further directions

Several limitations should be considered when interpreting the findings of the present study. First, the sample consisted of only three male participants. Although the multiple case-study design allowed for a detailed examination of individual linguistic trajectories and sociolinguistic environments, the small and homogeneous sample does not permit statistical generalisation. The findings should therefore be regarded as exploratory and analytically informative rather than representative of autistic bilingual children as a population. Future research should include larger and more diverse samples, including girls and gender-diverse autistic individuals.

Second, the study adopted a cross-sectional design. Although parental reports and clinical records provided valuable information about earlier stages of language development, they cannot replace repeated direct observations over time. A longitudinal design would make it possible to examine changes in language development. At the same time, the reliance on parental reports also means that some information may have been affected by recall bias or by different interpretations of what constitutes language knowledge or fluency.

A further limitation concerns the absence of standardised bilingual assessments. Such tools are difficult to identify or unavailable for autistic bilingual children, particularly when participants present attention deficits and atypical language profiles. Consequently, it was not always possible to compare linguistic abilities across languages. Nevertheless, the use of video-recorded semi-structured language samples represents an important strength. Indeed, the study contributes detailed qualitative data on how autistic bilingual children use their linguistic repertoires in context. This contribution is particularly relevant in the Italian context, where fine-grained observational data on the spontaneous language production of autistic bilingual children remain limited.

Finally, some limitations concern the comparability and analysis of the language samples. The sessions differed in duration, activities, interlocutors, and levels of participation, and were conducted in a clinical setting rather than in the children's homes or schools. In addition, the category *Other* included heterogeneous material; a more in-depth analysis should be conducted for future research. Language attribution was occasionally uncertain due to reduced intelligibility and phonological variability. Moreover, all recordings were transcribed and analysed by the author alone, and no independent inter-rater verification was conducted. Future studies should therefore involve at least one additional trained multilingual annotator and report inter-rater reliability.

7. Conclusion

This thesis examined the bilingual and multilingual experiences of three autistic children, with particular attention to the linguistic output. The findings highlight that bilingual development in autism is inherently heterogeneous and dynamic. Crucially, these empirical findings reinforce prior research challenging the assumption that exposure to multiple languages inevitably hinders language acquisition. On the contrary, multilingual exposure can be compatible with the gradual mastery of the dominant societal language, underscoring the necessity of evaluating an autistic child's complete linguistic system.

Findings also suggest that unexpected bilingualism can manifest in different forms and through different channels, from spoken vocabulary to written production, therefore assessments of the phenomenon should consider both verbal and written production. Moreover, unexpected bilingualism has important theoretical implication for the understanding of language acquisition, which needs to be assessed in further studies. However, its significance must not depend solely on its utility for validating linguistic models or identifying cognitive advantages. Indeed, unexpected bilingualism carries profound intrinsic value as a legitimate form of expression and lived experience. When an autistic child demonstrates a sustained interest in an additional language or script, that channel might serve as a functional tool for communication, self-regulation, play, and learning. Depriving a child of a meaningful linguistic resource, without evidence of harm, constitutes an unjustified restriction of their communicative autonomy.

Finally, parental interview revealed that the families value heritage-language maintenance; nonetheless, translating positive attitudes towards bilingualism into everyday language use can be challenging. Moving forward, future longitudinal and multimodal research should aim to document the full diversity of autistic language experiences, thereby fostering educational and clinical practices assessing multilingualism as a vital cultural and personal resource.

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