

A Literature Review on Bilingualism among Children Diagnosed with Autism Spectrum Disorders

Una revisión de la literatura sobre el bilingüismo entre los niños diagnosticados con Trastornos del Espectro Autista

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RESUMEN

Los fonoaudiólogos son comúnmente consultados por padres bilingües de niños con Trastornos del Espectro Autista (TEA) respecto de la decisión de adoptar el monolingüismo o bilingüismo con sus hijos. Estos padres solicitan la opinión profesional porque temen que la exposición a dos idiomas podría contribuir a desafíos adicionales y retrasos en la evolución del lenguaje de sus hijos. Sin embargo, es escasa la literatura disponible para que los fonoaudiólogos los guíen en su elección de utilizar una o dos lenguas con sus hijos. Sin investigaciones basadas en evidencias, los fonoaudiólogos siguen recomendando que los padres bilingües de los niños con TEA limiten la exposición lingüística de sus hijos a un solo idioma (con mayor frecuencia inglés). Las ideas subyacentes en dicha recomendación son tres: a) convertirse en bilingüe es demasiado difícil para los niños con TEA; b) el bilingüismo dificulta el rendimiento académico de los niños; y c) el bilingüismo es una fuente adicional de retrasos de lenguaje y habla. Esas tres ideas acaban por producir más preocupaciones en los padres que, consecuentemente, optan por el monolingüismo. En este trabajo se analiza si –y hasta qué punto– esta recomendación es ratificada o refutada por la literatura publicada en los últimos diez años y se ofrece una mirada crítica a los resultados de la misma.

Palabras clave: bilingüismo, niños, autismo.

ABSTRACT

Speech-language pathologists (henceforth SLPs) are constantly consulted by bilingual parents of children with Autism Spectrum Disorders (henceforth ASD) regarding their decision to adopt monolingualism or bilingualism with their children. These parents fear that dual-language exposure could contribute to additional challenges and delays in their children's language development. Scarce literature is currently available for SLPs to guide parents of bilingual children with ASD in their decision to use one or two languages with their children. Despite the dearth of evidence on which SLPs would base their language recommendations, it is reported that they often recommend parents of bilingual children with ASD to limit the linguistic exposure of their children to only one language (most often English). The assumption in such a recommendation –which echoes the parents' fears– is that becoming bilingual is too challenging for children with ASD; detrimental to their academic achievement; and a source of additional language and speech delays. The purpose of this review is to analyze whether –and to what extent– this recommendation is supported or disputed by the literature published in the last ten years, and to critically discuss the results of that literature.

Keywords: bilingualism, children, autism.

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Introducción

Bilingual children and children with ASD are two noteworthy demographics that are increasing within the U.S. school-age population. According to the U.S. Department of Education, the percentage of school-age children being raised in bilingual families (also referred to as English Language Learners - ELL) increased from 8,7% (an estimated 4.1 million students) in 2002-2003 to 9,1% (an estimated 4.4 million students) in 2012-2013. Regarding ASD, the Center for Disease Control's (CDC) most updated count for the prevalence of children diagnosed with ASD¹ was 1 in 68, reported in 2010 (CDC, 2010) – a staggering increase in the last ten years. This increase may be a consequence of many factors such as changes in the definitions of autism and its broader range; changes in diagnostic criteria over time; variability in diagnostic practices; earlier diagnosis and, genetic and environmental factor, among others. The CDC also reported that ASD has increased among minorities and accounts that African-American and Latino children show the greatest increases in ASD prevalence, 91% and 110%, respectively. Asians have the third highest prevalence rate – 1 in 103 children (CDC, 2012).

Unfortunately, the CDC does not report on the linguistic demographics of children with ASD nor does the Department of Education report on the

prevalence of ASD within the bilingual population. However, considering that the CDC indicates that the prevalence of ASD has increased among minorities (and minorities frequently speak a language other than English), it is possible to estimate that the number of children diagnosed with ASD and raised in bilingual families may have increased proportionally.

The literature that approaches bilingualism as a health/medical issue is extensive. Rudimentary research for studies on bilingualism and studies on ASD were conducted on three database search engines –ComDisDome, CINAHL, and Medline– between March and May of 2015. An abundance of studies on bilingualism was found on each of the three database search engines: 349, 1,573, and 53 respectively. A quick access to the same database searches ComDisDome, CINAHL and Medline – revealed the numerical abundance of studies on ASD: 2,641, 1,540, and 5,987, respectively. When the variable *children* was included in an advanced search, the number of studies rose to 4,999, 2,178, and 10,322, respectively. However, despite the immense attention given to bilingualism and to ASD in children as isolated factors, the search showed that little attention is given to the connection of children diagnosed with ASD when they are bilingual. In other words, when the three variables *bilingualism*, *autism*, and *children* were entered together in the advanced search, the decrease of the number of articles available was significant: 3, 4, and 5, respectively.

This dearth of research integrating the three variables signifies that little is known about whether being raised bilingual is advantageous or detrimental to language development in children with ASD.

¹ Autism spectrum disorder (ASD) is defined as a neurodevelopmental disorder characterized by deficits in social communication and social interaction and the presence of restricted, repetitive behaviors. Social communication deficits include impairments in aspects of joint attention and social reciprocity, as well as challenges in the use of verbal and nonverbal communicative behaviors for social interaction. Restricted, repetitive behaviors, interests, or activities are manifested by stereotyped, repetitive speech, motor movement, or use of objects; inflexible adherence to routines; restricted interests; and hyper- and/or hypo-sensitivity to sensory input. <http://www.asha.org/Practice-Portal/Clinical-Topics/Autism/>

In the context of diagnosis and treatment of speech and language impairments, this scarcity of literature may implicate two complementary sets of questions from two different perspectives. From a clinical perspective, one may ask: Why is the literature on bilingualism and ASD so limited? How can such a limitation influence SLPs' clinical practice when dealing with ASD bilingual population? Considering such a lack of research, how are SLPs supposed to use evidence-based practice² to support their clinical work with bilingual children diagnosed with ASD? How can SLPs provide support to parents of children with ASD regarding their decisions to communicate in one or two languages with their child? From a research perspective, one may ask: How can SLPs conduct therapy with bilingual children with ASD when there is no empirical evidence to support their practices? What are the scientific underpinnings of the recommendations SLPs give to parents of ASD bilingual population? What are the consequences of such recommendations? What are the substitutes for evidence-based practices that guide SLPs' services to ASD bilingual population?

Even if it is far beyond the boundaries of this text to answer these questions extensively, these are not formulated as a mere rhetorical strategy. Besides being methodological, they are also, and more significantly, substantive. They are formulated as an ontological and epistemological exercise with which it is possible to delineate a crucial need to integrate research and practice regarding the relationship between bilingualism and ASD.

² Evidence-based practice (EBP) in speech-language pathology is an approach to clinical decision making in which different sources of information (i.e. external empirical evidence, internal evidence developed by the clinician, and the client characteristics) are integrated into an action plan that best serves the long-term interests of individuals with communication disorders.

Hence, this “chicken or egg” dilemma points not only to the futility of identifying the foundation of a circular cause and consequence, but also, and more importantly, to the urgent need for researchers and SLPs to combine their efforts and skills to find ways to better serve ASD bilingual population. In other words, those two dichotomized sets of questions could be merged and reformulated as: How can researchers and SLPs work together to better serve the ASD bilingual population? What are the questions that both researchers and clinicians need to ask –and answer– when dealing with ASD bilingual population?

In this context, and considering the constraints of this paper, this study focused on reviewing the available literature on bilingualism among children diagnosed with ASD and, as a corollary, on commenting on some of the recommendations –as well as their implications– that SLPs give to parents of bilingual children with ASD. Themes that were common or uncommon among the studies were highlighted.

Methodology

A preliminary survey of the literature indicated that a systematic review would provide the most appropriate results due to both the diversity of employed research designs and the heterogeneity of the populations, interventions, and methods adopted by the studies. A structured review was restricted to peer-reviewed literature published from May 2005 to May 2015, with additional sources consulted as needed for coverage of certain topics. A template was developed to summarize each study. *ComDisDome*, *CINAHL*, and *Medline* database

searches were conducted from March to May 2015 to retrieve articles related to bilingual children with ASD. Search items included “autism”, “bilingualism”, and “children”. Journal articles were retrieved from diverse fields of study, such as autism development disorder, autism spectrum disorders, language communication disorders, medical speech pathology, and child neurology.

The reviewer independently read each article in full text ($n = 12$ articles), evaluated the relevance of retrieved articles, and recorded the main findings of each study in a table. Next, each article was determined to be included or excluded based on the criterion of the article’s relevance to the study. Ten articles were included, as shown in Table 1.

Table 1

List of Articles on Bilingualism among Children with Autism Spectrum Disorders

Article	Methodology	Participants	Outcomes
Fahim & Nedwick (2014) studied Dual Language Learners (DLLs) children with ASD in order to present cultural and linguistic evidence-based intervention practices and strategies that are useful for young children and their families in the home.	Case history	3 bilingual families (English & Arabic; English & Yoruba; Spanish & English) raising ASD children.	The exposure of DLLs children with ASD to bilingual education had positive affects in terms of child’s long-term well-being, mental health, access to community, and educational benefits.
Yu (2013) studied the language practices of bilingual immigrant mothers with their ASD children in order to understand the nature of the language practices, their constraints, and their impact.	Phenomenological study	10 Chinese-English bilingual mothers of children with ASD.	Bilingual mothers of children with ASD believed that bilingualism made learning more challenging to their children; consequently, they adopted the English Only approach with their children because they perceived it as advantageous to intervention access and wellness.
Garcia, Breslau, Hansen & Miller (2012) conducted a study on the social consequences of an “English Only” recommendation for bilingual families of children with the Autistic Spectrum Disorders.	Ethnographic narrative	5 bilingual families of children with ASD.	“English Only” recommendation was given to all families participating in the research. Diverse negative effects of this language choice on the lives of the children, including loss in family, school, and community interactions were found.
Hambly & Fombonne (2011) studied the impact of bilingual environment on language development in children with ASD in order to investigate whether bilingually-exposed children with ASD experienced additional delays in language development.	Statistical analysis	75 bilingual children with ASD.	No evidence that bilingual exposure caused additional delay for children with ASD.
Chaidez, Hansen & Hertz-Picciotto (2012) analyzed the relationship between multiple language exposure and language function and scores of ASD children in order to compare differences in autism between Hispanic and non-Hispanics.	Case-control study	1.061 children.	Several predictors were found to be associated with lower expressive language scores including: diagnosis of ASD, speaking to the ASD child in a second language 25-50% of the time, and Hispanic ethnicity. The study also found that maternal college education was associated with higher scores.

Petersen, Marinova-Todd & Mirenda (2012) investigated lexical comprehension and production and overall language skills in bilingual and monolingual preschool-aged children with ASD.	Exploratory study	28 children diagnosed with ASD: 14 English-Chinese bilingual and 14 English monolingual.	Bilingual and monolingual children with ASD had equivalent scores on language measures including English production vocabulary, conceptual production vocabulary, and vocabulary comprehension. The study provided evidence that preschool-age children with ASD have the capacity to function successfully as bilinguals.
Valicenti-McDermott et al. (2012) analyzed multidisciplinary evaluations done in toddlers with ASD in order to compare expressive and receptive language skills in monolingual English and bilingual Spanish-English children with ASD.	Review	80 toddlers with ASD: 40 Spanish-English bilinguals and 40 English monolinguals.	Compared to monolinguals, bilingual children with ASD were more likely to vocalize and utilize gestures, with no other differences in language skills. The study concluded that bilingualism did not negatively affect language development in young children with ASD.
Bird, Lamond & Holden (2011) surveyed parents or guardians of children with autism who were members of a bilingual family in order to investigate parents' concerns related to bilingualism and autism.	Survey	49 bilingual families who had children with autism.	Parents concerned about choosing bilingualism for their children with ASD. They presented worries about lack of services and supports and concerns about whether their children would be able to learn two languages.
Seung, Siddiqi & Elder (2006) observed a bilingual Korean-English child with ASD in order to evaluate the efficacy of a bilingual speech-language intervention.	Longitudinal case study	1 Korean-English bilingual with ASD.	Language service to bilingual children with ASD should be provided first in the primary language and, as the child would make gain in the primary language, a gradual transition could be made to intervention in English.
Kremer-Sadlik (2005) studied the relationship between clinicians' recommendations on bilingualism and autism and the linguistic choice opted by bilingual families children with ASD.	Ethnography and discourse analysis	4 high functioning children with ASD and their parents.	Clinicians and educators recommended that parents of bilingual children with ASD use English Only. Bilingual families who opted to use English Only with their ASD children had more trouble making emotional connections and affective interactions with them. The study concluded that English Only recommendation is detrimental to the development in children with ASD because they need to make an emotional connection with their parents on order to maintain engagement in social interaction.

Findings

The ten mentioned above articles described relevant themes associated with bilingualism and autism. Below, the key common themes are presented.

Key common themes

Parents' perspective on bilingualism in children with ASD. Five of the ten selected articles were written by authors who interviewed bilingual parents of children with ASD. The similarity among those articles regarded not only the methodology used but also the observation yielded. All the articles reported that the parents feared that bilingualism would be

developmentally challenging to their children. Yu (2013), for example, showed that among 15 Chinese-English bilingual parents, the majority ceased speaking Chinese to their children because they did not want to confuse their children or increase their children's speech delay. The author concluded that the participants in the study considered bilingualism too developmentally challenging. Additionally, code-switching and mixing languages were seen as particularly problematic. Bird, Lamond & Holden (2011). Similarly, reported that French-English bilingual parents were fearful of speaking a non-English language to their children. Kremer-Sadlik (2005) showed that parents chose to raise their children using English only because they believed that the complexity of bilingualism would hinder their children's development. Petersen et al. (2012) suggested that the commonly held belief that bilingualism was too confusing and even unreasonable to expect of children with ASD led to potentially detrimental outcomes for autistic children from bilingual children. Hambly & Fombonne (2011) hypothesized that the social impairment characteristics of ASD could cause additional language delays in bilingually-exposed children with ASD compared to monolingually-exposed children with ASD. They proposed to investigate whether those additional delays would manifest in smaller expressive vocabulary, lower levels of language comprehension and production, and later onset of early language milestone for bilingually-exposed children with ASD. In order to test their hypothesis, the authors compared the social abilities and language level of children with ASD from bilingual and from monolingual

environments. Results of the study indicated no language delays associated with bilingual exposure for children with ASD. From this conclusion, the authors suggested that caregivers should not be discouraged from maintaining a bilingual environment for children with ASD.

In summary, the five studies consistently reported that the parents' perspective on bilingualism among children with ASD was that of apprehensiveness and fearfulness. This perspective stemmed from concerns that their children with ASD would become too confused, that learning two languages would be too hard, and that the children would not become fluent enough in English to socialize with peers and participate in school.

Clinical recommendations. Several articles suggested that SLPs share parents' opinions that bilingual language exposure should be avoided among children diagnosed with ASD. When consulted by parents, SLPs supposedly recommended that fathers and mothers limit the language input to a single language³. The authors indicated that SLPs may be aware that bilingualism does not cause additional language and speech impairments among bilingual clients with ASD. However, those same professionals may advocate moving from bilingualism to monolingualism as a way to improve their ASD clients' communications. The reasoning is that the extra demands of bilingualism, if removed, would lighten the burden

³ Of course that defining which language would be maintained is highly contentious and changes historically/geographically. In the US, for example, the advice is often that the children should have a solid foundation of English in detriment of Spanish or any other minority language. In South American countries (with few exceptions such as Brazil), on the other hand, Spanish is the dominant language and, consequently, maintained in detriment of several indigenous languages.

on the child. Then, the supposed complexity of a bilingual environment would be relieved by a reduction to one language.

For example, Kremer-Sadlik (2005) stated that all the parents participating in the study reported to have received professional recommendations to speak to their children in English only, regardless of the parent's proficiency in the language. The author reported that, according to the parents, clinicians emphasized the importance of simplifying the children's linguistic input by exposing them to the same language inside and outside the home. Bird et al. (2011) conducted a study in which respondents were asked to indicate whether they had received advice about bilingualism and ASD from professional and, if so, what advice they had received. Results showed that of parents who opted to raise their children with ASD in a monolingual environment, 80% had received advice from professionals to do so. Another issue highlighted by the authors is the need for professional training. SLPs must know that bilingualism it is not a direct cause of speech or language impairment in ASD population. They mentioned that parents were receiving conflicting advice from different SLPs or advice was not consistent with the choices families were making for their children with ASD. The authors suggested that professionals themselves need more guidance in this area. Garcia et al. (2012) reported that despite the lack of evidence on which to base such language recommendations, SLPs advised parents of children recently diagnosed with ASD to maintain an English only household. Hambly & Fombonne (2011) compared the social and language abilities of 75 children with ASD categorized into three groups:

Monolingually exposed, bilingually exposed before 12 months of age, and bilingually exposed after 12 months of age. The abilities that were assessed across the three groups included social responsiveness, initiating of pointing, response to pointing, attention to voice, total conceptual vocabulary, words in dominant and second languages, age of first words, and age of first phrases. The authors found that bilingually exposed children with ASD did not show additional delays in those areas as compared to monolingually exposed children. They concluded that given those findings, parents and caregivers should not be discouraged from continuing to speak to their children in two languages or from introducing a second language. Yu (2013) stated that in the absence of evidence that bilingualism is detrimental to children's language development, and in the light of its many benefits, advising parents to stop speaking their home languages would be highly problematic. The author also mentioned that advising parents to speak English only with their children would contradict the positions of the American Speech-Language-Hearing Association (ASHA, 2004, 2005, 2011), which urges practitioners to show deference to families' cultural and linguistic preferences.

Following the author's reasoning, it can be stated that advising parents of children with ASD not to communicate bilingually is unethical. It could also be noted that such a recommendation is unlawful since educators and health care providers have the legal responsibility to provide equal access to language appropriate services to students with disabilities⁴.

⁴ As it was affirmed by the Education for All Handicapped Children Act of 1975 and the Section 504 of the Rehabilitation Act of 1973.

Fahim & Nedwick (2014) pointed out that clinicians recommended bilingual parents and caregivers discontinue bilingual language exposure when children were diagnosed with ASD. The authors stated that in cultures where the extended family and community were highly valued, maintaining the child's home language would be important because it guarantees access to family and community supports. They concluded that the disadvantages of limiting children with ASD to input from a single language would outweigh the advantages. Considering that a language is an important cultural artifact and, at the same time, a tool to have access to cultural elements, one of the advantages encouraging bilingual language use among children with ASD would provide opportunities for them to become active members of the cultural communities in which they belong. In other words, the study by Fahim & Nedwick (2014) supports the rationale that among bilingual families who have a child with ASD, bilingualism may become an important resource for the child in the process of becoming competent member of his or her community.

Researchers' conclusions on bilingualism among children with ASD. In contrast to parents' and clinicians' perspectives regarding bilingualism, researchers' conclusions supported the use of bilingualism with children diagnosed with ASD. Nine out of ten articles concluded that bilingualism was not detrimental to children with ASD; on the contrary, they suggested that bilingualism was an important resource through which children with ASD could have access to cognitive, social, affective, and emotional advantages.

Kremer-Sadlik (2005), for example, stated that developing bilingual abilities in children with ASD was essential for the facilitation of communication with bilingual parents, the formation of ethnic identities, and the increased opportunity for social interaction in and out of the home. The author suggested that the choice to not raise a child with ASD bilingually could deny the child the benefit that would come with being bilingual. Petersen et al. (2012) compared the language abilities of 14 monolingual, English-speaking children with ASD with those of 14 age-matched bilingual English-Chinese speaking children with ASD. They compared the two groups' vocabulary skills and general language skills using a bilingual version of the *Peabody Picture Vocabulary Test-3*, the *MacArthur-Bates Communicative Development Inventories (CDI)*, and the *Preschool Language Scale-3*. They found that bilingual children with ASD had larger total production vocabulary and no significant differences in the size of their conceptual vocabulary or English vocabulary compared to the monolingual children. They concluded that children with ASD had the potential to be bilingual without experiencing disadvantages in their language development. Valicenti-McDermott et al. (2012) reviewed at testing data for toddlers with ASD. Their analysis revealed that bilingual toddlers with ASD cooed more often than the monolinguals. The bilingual groups also demonstrated increased pointing, leading to desired objects, and pretend play. Fahim & Nedwick (2014) claimed that it was not necessarily advantageous to limit a bilingually exposed child diagnosed with ASD to input from a single language. They also argued that since home is an ideal place to teach functional

communication, parents should not limit their interactions with their ASD children to only the mainstream language⁵.

Lack of bilingual interventional services. Despite researchers' findings that the use of bilingualism should be encouraged among children diagnosed with ASD, three of the selected articles demonstrated that one barrier for parents to keep using their home language and English with their ASD children is the lack of bilingual interventional services. The first article, by Seung et al. (2006), identified this lack of language services offered to bilingual children diagnosed with ASD and, based on that identification, decided to evaluate the efficacy of a bilingual speech-language intervention. The researchers conducted a longitudinal case study on a bilingual Korean-English child with ASD. The authors found that language services to bilingual children with ASD should be provided first in the family primary language and, as the child would make gain in the primary language, a gradual transition could be made to intervention in English. Bird et al. (2011) identified another barrier. In the study, bilingual parents of children with ASD reported that most, if not all, of their educational and interventional services were provided in English, and that primary language alternatives were not available. The authors suggested that children with ASD who were raised in bilingual families should have access to speech and language therapy services provided in

their two languages. Bilingual therapists were identified by the parents in the study as useful and critical in ensuring that equitable services would be available in multiple languages. A third article, by Yu (2013), showed that bilingual Chinese-English parents decided to speak only English to their children because early intervention and special education services were offered exclusively in English. According to the author, the biggest challenge identified by parents was that very few interventions were available in Chinese. All the mothers in the study reported that all of their children's service providers spoke only English.

The findings of these three studies are consistent with national data that very few intervention resources in languages other than English are available. In 2010⁶, it was reported that under 5% of 130,000 ASHA certified SLPs were self-described as bilingual (in this case, bilingual is defined as having "near native" proficiency in a language other than English⁷). At year-end 2013, ASHA⁸ represented 161,163 audiologists; speech-language pathologists (SLPs); speech, language, and hearing scientists; and audiology and speech-language pathology support personnel. Of the 161,163 individuals represented by ASHA, 7,214 (5%) indicated that they met the ASHA definition of bilingual service provider. Of these, 6,491 were ASHA-certified SLPs and 580 were ASHA-certified audiologists. Of the 7,214 individuals who met the ASHA definition of bilingual service provider,

⁵ Even though this is not the topic of this text, it is valid to mention that research comparing the language abilities of monolingual and bilingual children with Down Syndrome shows that they are similar in the degree and types of language difficulties they display. Most children with Down Syndrome do not reach the levels of proficiency in either language compared with their peers in mainstream classrooms, nevertheless they reach functional levels of proficiency in two languages according to their abilities (Baker, 2010; p. 355).

⁶ ASHA counts for Year End 2010.

<http://www.asha.org/uploadedFiles/2010-Member-Counts.pdf#search=%22ASHA%22>

⁷ Research indicate that, paradoxically, at the same time, almost all SLPs have worked with at least one client from a home where a language other than English was spoken (Kritikos, 2003).

⁸ More information:

<http://www.asha.org/uploadedFiles/Demographic-Profile-Bilingual-Spanish-Service-Members.pdf>

most (4,152 or 58%) were Spanish-English bilingual service providers.

Differences among monolingual and bilingual children with ASD. One way that researchers support their advocacy for the use of bilingualism among children diagnosed with ASD was to present empirical evidence that bilingualism was not detrimental to ASD children's language development. Petersen et al. (2012), for instance, reported no differences between bilingual children with ASD and their monolingual peers in terms of conceptual vocabulary in both home language and in English vocabulary sizes. Hambly & Fombonne (2011) showed that there was no difference between bilingual and monolingual children with ASD regarding expressive and receptive communication skills, as well as their socio-communicative levels. Valicenti-McDermott et al. (2012) showed that there were no differences regarding number of words, presence of word combinations, babbling or vocalization. These studies were consistent in reporting no difference in language development between monolingually exposed and bilingually exposed children with ASD.

Despite the mentioned similarities, some of the articles presented themes that were unique to their studies. Below, the most relevant uncommon themes are presented.

Uncommon themes

Recommendations to SLPs and Parents. Fahim & Nedwick's (2014) work was the only one to provide a set of recommendations for SLPs and parents when working with bilingual ASD children, such as: The use of alternative augmentative communications in both languages; the provision of visual support in both

languages; the development of activities schedules and visual supports for both languages; and the conduction of the same teaching and therapeutic activities in both languages. Additionally, the authors provided a specific intervention cycle to be used with bilingual children diagnosed with ASD.

Bilingualism as detrimental to language development among children with ASD. Chaidez et al.'s work (2012) was the only study to positively correlate bilingualism to language delays in children with ASD. The authors conducted a case-control study on the relationship between multiple language exposure and language function and scores of children with ASD in order to compare differences between Hispanic and non-Hispanic groups. The authors concluded that several predictors were associated with lower expressive language scores including diagnosis of ASD, speaking to the child with ASD in a second language 25-50% of the time, and Hispanic ethnicity. The study also found that maternal college education was associated with higher scores. This study data was composed of 1061 children with ASD, the highest quantity of subjects of all the studies reviewed.

Types of bilingualism and autism. The study conducted by Hambly & Fombonne (2011) was the only one to ascertain whether differences existed between bilingual children with ASD exposed to simultaneous bilingualism and those exposed to sequential bilingualism⁹. They found that the only difference in effect that the two types of bilingualism

⁹ *Simultaneous bilingualism* is used to refer to those children who have experience with two languages beginning at or shortly after birth. This is the case when two languages are spoken in the home by primary care providers. In contrast, *sequential bilingualism* is used to refer to those children who have experience with a single language first beginning at birth and begin to acquire a second language at some point during childhood.

had on children with ASD referred to interpersonal domain in which the simultaneously exposed bilinguals had the highest scores.

Discussion

This review identified a scarcity of literature that intersected reflections about bilingualism and treatment of speech language disorder of children with ASD. It showed that few studies were published in the last ten years. However, it is important to mention the few research studies available presented predominantly concurrent results. One consistent result reported by the studies pointed to the lack of evidence that bilingualism would have negative effects on the language outcomes of children with ASD. Another consistent result was that adopting monolingualism with children with ASD coming from bilingual families would be detrimental to their linguistic, cognitive, affective, and social development. Finally, regarding language and speech services rendered by SLPs, the studies concurred that they should be provided first in the family's primary language and, as the child makes gain in the primary language, a gradual transition could be made to intervention in English.

Despite the cohesiveness and quality of the articles, they presented some limitations that are worth mentioning. Firstly, the vast majority of studies (except one) employed a qualitative methodology based exclusively on observation, narrative, and interview, which consequently yielded "subjective" data. More quantitative research yielding experimental data is needed. Secondly, none of the studies included information on the severity of the participants' diagnoses. This is an important

distinction to be considered not only because, according to the DSM-5, individuals who are given the diagnosis of ASD need to be also rated with one of three levels of severity but also, and more importantly, because the rates indicate the amount of support needed in the area of social communication. Consequently, results of the adoption of monolingualism or bilingualism may vary among ASD rated as mild, moderate, or severe. Another restraint of the studies, and perhaps the most remarkable one, is that many authors mentioned that SLPs supposedly endorsed the use of monolingualism (*English Only*) with ASD children; however, none of them presented any direct data to support such statement. Thus, there is a lack of research that present surveys, interviews, observations, or consultations with SLPs regarding their positions about bilingualism and ASD population. These limitations indicate that more research is needed.

There remain several critical issues to consider in the field of speech-language pathology regarding the interplay of ASD and bilingualism. Contributions to be made by future studies may include: 1) experimental studies regarding the efficiency of exposing children with different severities of ASD to bilingualism; 2) exploratory studies regarding parental education about bilingualism and ASD; 3) SLPs' training in bilingualism and ASD at both the pre-service and in-service levels; 4) in-depth research on SLPs' perspectives on serving the bilingual ASD population.

The results of this literature review suggest that Speech-Language Pathologists, when serving bilingual children diagnosed with ASD, should

collaborate with their clients' parents in order to meet those children's unique linguistic needs and, ultimately, to increase their rates of social communication in bilingual contexts.

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