Bilingualism in Autism Spectrum Disorders:

What do Speech-Language Pathologists Need to Know?

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Introduction and Background:

Speech-language pathologists typically serve at least one bilingual client in their caseload (Kritikos, 2003). A bilingual is defined as someone who is proficient (speaks, reads, and writes) in two languages. The growing number of bilingual clients and clients from linguistic minorities occur in tandem with the rise in incidence of children with autism spectrum disorders (ASDs) – 1 in 59 children (CDC, 2018). Autism spectrum disorder involves developmental challenges in social communication and the presence of restricted and repetitive behaviors (DSM-V, 2013). As of 2018, 90% of school-based speech-language pathologists (SLPs) worked with students on the autism spectrum (ASHA, 2018) with several children raised in bilingual households.

While substantial research evidence supports the cognitive and communication benefits of bilingualism in typically developing children (Roseberry-McKibbin, 2002), little is known regarding the impact of bilingualism among children on the autism spectrum (Hudry, Rumney, Pitt, Barbano, & Vivanti, 2017). In addition, there is limited research evidence to inform best practices for bilinguals and linguistic minorities with ASD. As a result, recommendations and resources to guide parents and service providers are inadequate. Bilingual parents are often confused and worried about the choice of language input in the home environment (Yu, 2013); they worry that children, who already present with language challenges, would be confused by the exposure to two or more languages.

Overwhelmed and anxious parents often bring their concerns to speech-language pathologists, who are among the primary service providers for children with ASD. As part of their clinical duties, SLPs are required to understand parent priorities, answer questions regarding the choice of language, provide relevant research-based suggestions, and support parents in their everyday interactions with the child. In order to provide a well-informed, research-based guidance for SLPs working with bilingual families of children with ASD, the current clinical resource has one main purpose: to provide suggestions and guidelines for SLPs to achieve best practices in service delivery for children with ASD from bilingual backgrounds. The article adopts a question and answer format in achieving this goal. This format was adopted for several reasons: (1) to provide a readily available clinical resource for SLPs to consult, (2) to clarify issues around working with bilingual children with autism and their families, and (3) for the increased readability and accessibility to a wider audience (both early-career professionals and experienced clinicians). Question and answer formats in review articles have been previously used in the literature on communication disorders in addressing questions regarding the use of alternative and augmentative communication in early intervention (Cress & Marvin, 2003), understanding evidence-based practices and resolving myths (Schlosser, 2012), and identifying characteristics of central auditory processing disorders (Musiek & Chermak, 1995).

Method

A thorough review of literature search was conducted using electronic research databases such as ASHAWire, PsycINFO, and Web of Science. Search terms included “bilingualism,” “linguistic diversity,” “second language users,” and “autism” to identify studies published over the past 25 years that addressed bilingualism in ASD. In addition, we manually searched the

reference lists of the identified articles. We included only articles published in English. A total of 35 articles that identified bilingualism in ASD were identified. Both the authors read the articles, and excluded articles that did not address the purpose of the review. A final list of 26 articles were identified and were summarized by the first author. Languages represented by the families involved in these studies included Spanish (9 articles), Asian languages (5 articles), French (4 articles), Armenian (1 article), and other European languages (3 articles). Table 1 (Appendix) provides a summary of the purpose, methods, results, and implications of these 26 articles organized chronologically.

Results

After reviewing and summarizing the literature on bilingualism in autism spectrum disorders, we have integrated the findings in a question and answer format. In this article, we address 14 common questions raised by SLPs working with bilingual children with ASD. The responses to the questions integrate relevant literature on bilingualism in ASD.

Q1. As an SLP working with bilingual families of children on the autism spectrum, how important is it for me to know or speak the native language of my clients?

A1. Speaking the client's native language can be both helpful and convenient in developing a stronger sense of trust and rapport with the client and his/her family, and in communicating effectively (Santhanam & Parveen, 2018). However, it is likely that clinicians work with families that do not speak their primary language. Even bilingual SLPs might not share the language of their client. For example, a Spanish-English bilingual SLP may be working with a Hindi-speaking family.

Q2. What solutions are available for me when I work with a client who does not speak my native language?

A: There are several solutions available for you as an SLP who does not speak the client's native language.

1. Use of a language interpreter.
2. In the absence of a language interpreter, using a family member who is fluent in both English and the client's native language would be helpful (Roseberry-McKibbin, 2002). It is always helpful to form partnerships with family members, as their input will be helpful in the assessment and intervention process.
3. Several web-based applications provide real-time audio, video, and text-to-voice translations. A few examples of medical translation apps include xrompt, mediBabble, and Canopy Speak. Although these resources might lack accuracy in translating, they can act as alternatives in the absence of a professional language interpreter.
4. Looking up resources on the client's native language on the web or using the ASHA Special Interest Group 14 on cultural and linguistic diversity (SIG 14) as a resource.

Q3. Does a child with autism experience harmful effects because of dual language exposure? How can I support a family who is confused and overwhelmed about raising their child with autism in a bilingual home environment?

A3: Several parents and professionals alike have believed in the harmful effects of bilingual exposure to language development in children with autism. In fact, some studies in the past indicate that speech-language pathologists recommend the use of only one language in the home environment fearing negative impact on the child's language and cognitive development (Jegatheesan, 2011; Kay-Raining Bird, Lamond, & Holden, 2012; Yu, 2013).

Although research in this area is limited, most existing studies indicate that language development in children with ASD is not negatively impacted from dual language exposure. Children with ASD have the potential to be bilingual, and bilingual children with autism perform comparably to monolingual children with autism. Seung, Siddiqui, and Elder (2006), through a longitudinal investigation, showed that a Korean-English preschooler with autism made receptive and expressive language gains with systematic intervention in both languages. Peterson, Marinova-Todd, and Mirenda (2012) compared bilingual and monolingual children with ASD on their receptive and expressive vocabulary. Results revealed no differences between the groups. Similarly, Hambly and Fombonne (2012) reported comparable performances on social interaction, receptive, and expressive language measures between bilingual and monolingual children with ASD.

Even early vocalizations (Valicenti-McDermott, Tarshis, Schouls, Galdston, Hottinger, Seijo, Shulman, & Shinnar, 2013) and first word acquisition (Ohashi, Mirenda, Marinova-Todd, Hambly, Fombonne, Szatmari, et al., 2012) were similar between both groups. One study examining pragmatic language competencies of children with ASD exposed to two Chinese languages, (Reetzke, Zou, Sheng, & Katsos, 2015) revealed that bilingual children matched their monolingual counterparts. Although these studies differ in their participant characteristics and language assessment measures used, it is clear that despite recommendations to use only one language, bilingual and monolingual children with ASD perform comparably in their communication and language.

Q4. Is dual language exposure beneficial to the language development of children with autism?

A4. In contrast to research on the benefits of bilingualism to typically developing bilingual children (Adesope, Lavin, Thompson, & Ungerleider, 2010), we do not have research evidence to support the idea that dual language exposure is beneficial for children with autism. We do know that children with autism have the potential to be bilingual, but we do not know if they benefit from bilingual exposure in ways that typically developing children do.

Q5. If a child with ASD is exposed to two or more languages, will the child demonstrate the same amount of proficiency in each of those languages?

A5. Similar to typically developing children, language proficiency depends on several factors. In children with autism, factors such as symptom severity, presence of maladaptive behaviors, the child's attention and memory, the amount of language input in each language, and the child's motivation and interest toward a specific language are some of the contributing factors.

Q6. What can I do if the family chooses to give up their native language and chooses English over native language use?

A6. Bilingual families with children on the autism spectrum have the same choices and preferences as bilingual families that do not have a child with autism. In the United States, several bilingual families of children with ASD prefer using only one language, typically English, due to several factors. Several parents believe that English exposure provides more social and academic advantages over native language use (Yu, 2013). In an interview study involving 15 Chinese-English bilingual families, parents reported that they chose English over Chinese because parents believed that code switching and bilingualism would worsen the child's pre-existing language challenges. Further, intervention and supports are predominantly available in English as access to bilingual service providers is limited (Jegatheesan, 2011). As a service provider, our role is to understand and respect the family's reasons and priorities in choosing one

language over the other. Nevertheless, it is within our scope of practice to discuss the academic and social implications of single versus dual language use.

Q7. How can I foster or encourage native language use at home?

A7. Bilingual parents typically prefer that their child is proficient in both English and their native language. There is overwhelming evidence from studies in parents of typically developing children from linguistic minorities indicative of a preference for heritage language maintenance. Parents report that using their native language builds a sense of intimacy among family members, helps claim cultural membership, develops a sense of pride in knowing and using the native language, and helps children communicate effectively with the extended family (Fishman, 2001). In one study, Chinese-English bilingual parents of children with ASD perceived that speaking their native language led to better parent-child interactions and a strong sense of maintaining their linguistic heritage (Yu, 2013). Using English alone limited children's interactions with members of their own linguistic community (Hambly & Fombonne, 2012). Further, sustaining interactions in English alone were difficult as parents were more fluent and comfortable in their primary language (Yu, 2016).

Despite the strong desire for bilingual proficiency, parents worry that concurrent or sequential bilingual exposure might exacerbate the child's language challenges. Given below are some ways that we can foster and support native language use:

- Discuss the importance and positive implications of maintaining the family's native language.
- Encourage parents to use the language that they are most comfortable with.
- Be instrumental in connecting parents to other bilingual families of children with ASD; these connections would allow parents to share and learn from the experiences of others.

- Educate parents on the absence of harmful effects of bilingualism and clarify any misconceptions that may exist.
- Remember that as SLPs, our role is to respect and support the family's preferences and the family's language choice.

Q8. I work with a child with ASD who uses a speech-generated device (SGD) to communicate because he is non-verbal. This child is raised in a bilingual environment. Do clinical considerations vary if the child is a bilingual AAC (Augmentative and Alternative Communication) user?

A8. Children acquire language by participating in meaningful social interactions. For children to participate in meaningful interactions, they need access to a modality for language use. In this situation, the language modality happens to be the use of a speech-generated device.

Speech-language pathologists can support the family in various stages of service delivery starting from assessment, selection of an AAC device, goal planning, customization of the device, and intervention. With very limited research evidence that guides clinical practice in bilingual AAC users, we can only make few informed considerations.

(1) One important consideration is the applicability and use of the device in multiple communication contexts (school, home, recreation, etc.).

(2) A thorough understanding of the client's native language and language development is required.

(3) We would also need to understand specific ways in which the client's native language differs from English. For example, English speakers interpreter picture-based sentences by using word order, but Japanese speakers use morphological markers (Nakamura, Iwabuchi, & Alm, 2006).

By working closely with the family, we can identify the child's communication needs and involve them in goal planning. Intervention goals need to be consistent with the family's language choice and cultural preferences. Soto and Yu (2014) recommend that while programming and customizing a communication device, we need to choose culturally appropriate symbols and messages, add culturally and linguistically relevant vocabulary, and incorporate the child's existing communication patterns. Family members need one-on-one coaching and support to learn how to use the communication device at home.

As individuals who do not speak the client's native language, the process of designing, customizing, and implementing an AAC device for a bilingual child with ASD can be extremely challenging. Therefore, it is important to work closely with families, address barriers that restrict service delivery, collaborate with language interpreters, and seek support from colleagues who speak the client's primary language.

Q9. Are access to services comparable for monolingual English-speaking and bilingual or linguistically diverse families?

A9. They are not comparable! In the last 5 years, studies have documented the disparities in time of diagnosis and access to services among families of children with ASD from linguistic and cultural minorities (Keller-Bell, 2017). Zuckerman, Mattox, Donelan, Batbayar, Baghaee, & Bethell (2013) reported that Latino families of children with ASD faced multiple challenges in accessing services and in the diagnostic process. While young children with ASD can receive a reliable diagnosis between 1 to 3 years of age (Landa, 2007), the median age of diagnosis for children with ASD from minority backgrounds is 50 months (Christensen, Baio, Van Naarden Braun, Bilder, Charles, Constantino, & Yeargin-Allsopp, 2016).

Access to health care, educational status, lack of English proficiency, socio-economic status, lack of awareness of disability among family members, lack of advocacy, and negative perceptions or stigma associated with disability are some factors that contribute to the discrepancy. Increasing awareness and education among families from cultural and linguistic minorities is important. In addition, we need to work with researchers, policy makers, and non-profit organizations to reduce disparities in service delivery.

Q10.What efforts has ASHA taken to increase the number of bilingual SLPs in the nation?

A10. According to ASHA (2013), only 6.5% of SLPs working in the United States are bilingual; a large number of SLPs are monolingual English speakers. In addition, among the bilingual SLPs, 4.41% are Spanish-English bilinguals. Therefore, the remaining 2.21 % comprises of bilingual SLPs who speak languages other than Spanish and English. This situation clearly indicates that the linguistic diversity among the clients we serve is not reflected among our service providers. The American Speech-Language-Hearing Association recognizes the need for more bilingual SLPs, and in recent years, several initiatives have targeted this need.

(1) Several graduate programs in communication sciences and disorders (CSD) have developed a specialized focus on issues related to CLD service delivery. For example, the graduate program in North Carolina Central University offers an immersive experience in working with CLD clients through clinical practicum and international field experiences (Keller-Bell, Scott, Jackson, Miller, Gillespie, & Bridges-Bond, 2017).

(2) ASHA encourages university programs to enroll more diverse students including students from minority racial/ethnic backgrounds and students from low socio-economic households (Anderson, 2016)

Q11. What resources are available for me when I work with bilingual or CLD clients?

A11. Given below are a list of resources. This list is not exhaustive, but is useful for clinicians to get started in their efforts to serve bilingual clients and clients from linguistic minorities.

(1) An ASHA special interest group (SIG 14) focuses on issues related to cultural and linguistic diversity. SIG 14 encourages its members to share resources and participate in online discussions.

(2) Numerous multicultural constituency groups are supported by ASHA. These groups assist several minority and diverse groups including the Native American Caucus, Asian Indian Caucus, Pacific-Islander Caucus, the Hispanic Caucus, and the National Black Association for Speech, Language, and Hearing (NBASLH), and the L'GASP-GLBTQ caucus. Members of these constituency groups respond to questions that clinicians may have about a specific group, and connect clinicians to useful resources.

(3) Several continuing education courses are offered by ASHA and the Colorado Speech, Language, Hearing Association (CSHA) that focus on support bilingual students, English language learners, and children from CLD backgrounds. A list of resources can be found in this link.

(4) Individual initiative as a service provider is also important. Reaching out to colleagues through the ASHA communities or social media groups (e.g., Bilingual SLPs group) can be a helpful resource. In addition, clinicians can also reach out to researchers working with a specific bilingual or linguistically diverse group to learn more about ways to support clients and their families.

(5) Specific to bilingualism in ASD, please use the reference list in this paper as a resource to reach out to researchers who focus on this area of study. Reading research on the topic

through ASHAWire or signing up for Google Scholar alerts can help you stay updated on recent developments.

(6) As a service provider, it is also important to conduct self-assessments to evaluate our cultural competence, and identify areas for improvement. Several resources are available on the ASHA website for service providers to heighten their awareness of providing services to bilingual or CLD clients. These include self-assessment checklists, an interactive web-based tool to evaluate one's own cultural competence.

Q12. What resources are available for me as an SLP working in Colorado?

A12. In Colorado, the Colorado Department of Education website provides resources and recorded webinars for working with CLD clients. These resources can be found in this link.

Q13. Are there any federal and/or state laws that I need to abide by when I work with bilingual or CLD families?

A13. The Individuals with Disability Education Act (IDEA), 2006 and Colorado state laws (CDE, 2010) require that assessment and treatment for clients from diverse language backgrounds should be conducted in their primary language or in a language that the client is most comfortable with. In addition, communication between the service provider and the client should be in a language and a format that they can easily understand. For example, handouts, pictorial descriptions, and web-based translation apps should be used appropriately to aid in comprehension of the content.

Q14. What additional resources are available for me to learn more about bilingualism in children with autism spectrum disorders?

A14. The table in the appendix provides a summary of articles that investigated bilingual children on the autism spectrum and their families.

Conclusion

Given the limited number of articles that address bilingualism in children with ASD in the last 25 years, more research is warranted to support families from diverse cultural and linguistic backgrounds and to guide professionals working with these families. Nevertheless, we understand that children with ASD have the potential to acquire two languages, and being bilingual is not disadvantageous for language acquisition or language use. Bilingual children with ASD perform comparably to their monolingual peers in all measures of language. Speech-language pathologists need to foster and support native language use in bilingual families and families of children from linguistic minorities. Clinicians should also engage in continued education on cultural competence, and make a commitment to evidence-based service delivery for the families they serve.

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Appendix

Table summarizing research on bilingualism in children with autism spectrum disorders and their families.

Authors	**Aim of Study**	**Participants**	**Findings**
Garcia, Breslau, Hansen & Miller (2012)	An ethnographic narrative case series to examine the social consequences of "English-only" recommendation for multilingual families of children with ASD	5 mothers of bilingual families with children with ASD in Boston	"English-only" recommendation in multilingual families altered the linguistic environment for their children with ASD with disruptions to family and social networks.
Hambly & Fombone (2012)	(a) To compare bilingual and monolingual children with ASD on language development (b) To compare simultaneous versus sequential language exposure of bilingual children with ASD (c) To look at social abilities of bilingual and monolingual children with ASD	75 children with ASD ages 36-78 months from Montreal and Ontario coming from both bilingual and monolingual families	(a) Bilingual-exposed children with ASD did not experience additional delays in language development compared to monolingual-exposed children (b) The timing of language exposure (simultaneous versus sequential) did not impact outcomes in the children's dominant language abilities (c) Social abilities were evenly distributed across all groups
Kay-Raining Bird, Lamond & Holden (2012)	(a) To investigate if bilingual families are raising their children with ASD to be bilingual (b) To examine what factors influence parents' decisions to raise or not raise their children with ASD bilingually	49 parents or guardians of children with ASD in bilingual families	(a) 61% of bilingual families exposed their children with ASD to two languages; 14% exposed their children with ASD to three languages; 25% exposed their children with ASD to one language (b) Respondents felt that bilingualism is important for

	(c) To look at how successful individuals with ASD are at becoming bilingual (d) To see what advice families receive from professionals about raising their child with ASD bilingually		opening doors for their children with ASD. Personal enrichment, travel, access to jobs and communication at school were listed as benefits to bilingualism. Respondents felt barriers of bilingualism as well, including limited access to resources and professional advice. Respondents also felt their child's language abilities, overall functioning and motivation were factors in deciding on bilingualism or not. (c) Parent responses revealed several children had strong abilities in two languages (d) 43% of parents reported that at least one professional advised them restrict their child to a monolingual environment, while 16% reported that professionals encouraged a bilingual language environment
Peterson, Marinova-Todd & Mirenda (2012)	To investigate lexical skills of monolingual and bilingual children with ASD	(a) Monolingual group (English only): 14 children with ASD in the age range of 44-73 months (b) Bilingual group(English-Chinese): 14 children with	(a) Bilingualism did not negatively affect young children with ASD (b) Bilingual children with ASD had larger total production vocabularies

		ASD in the age range of 43-73 months	(c) Both groups had equal conceptual vocabulary, English vocabulary and vocabulary comprehension (d) Bilingual children with ASD showed no differences in lexical development between both languages, although English scores tended to be higher than Chinese.
Ohashi et al. (2012)	To compare early language abilities of young monolingual and bilingual children with ASD who have been recently diagnosed	(a) 20 bilingual children with ASD simultaneously exposed, ages 31-50 months (b) 40 monolingual children with ASD, ages 31-52 months	No statistically significant differences between the two groups on any language measures. Bilingual environment does not hinder children with ASD in early stages of development
Valicenti-McDermott et al. (2012)	To compare expressive and receptive language skills in monolingual English and bilingual English-Spanish children with ASD.	80 toddlers with ASD, 40 classified as monolingual and 40 classified as bilingual.	Bilingual children with ASD did not show additional harmful effects to language development compared to monolingual children with ASD. Bilingual children with ASD produced more gestures than monolingual children with ASD.
Yu (2013)	To understand immigrant bilingual mothers' perceptions on the following: (a) The nature of their native language and bilingual practices with their children with ASD	10 mothers of at least one child with diagnosed ASD, who speak Mandarin Chinese as their primary language, who routinely communicate in English without an interpreter and who immigrated to the	(a) All mothers prioritized the language that was dominant in the society in which they intended to reside in to help their child with ASD participate in school and integrate into society in the

	(b) The factors constraining and/or facilitating language practices with their children with ASD (c) The impact of their chosen language practices on their children with ASD and their families	U.S. after receiving primary schooling in their countries of origin	U.S. All mothers valued Chinese highly, most frequently noting it enhances parent-child communication. (b) The biggest challenge mothers expressed was lack of services and resources available in Chinese. Most mothers also felt they did not know how to support their child's intervention after receiving no information or poor advice. (c) Majority of mothers described difficulties speaking English with their children with ASD.
Hambly & Fombone (2014)	To explore bilingual exposure, language, social impairment and cognitive factors that could influence second language (L2) expressive vocabulary size measured on the MacArthur-Bates Communicative Development Inventories.	33 bilingual children with ASD from Quebec and Ontario, ages 3-7 years old, with at least 50 words in expressive vocabulary	It is possible for young children with ASD to develop L2 expressive vocabularies with direct exposure to communication interactions. L2 vocabulary size correlates with dominant expressive language scores. Children with cognitive impairments have the ability to acquire bilingual vocabularies.
Kim & Roberti (2014)	To examine external social and cultural contexts that help raise bilingual children with ASD.	One child with ASD who was exposed to two different languages on a daily basis, without additional disabilities	Language consistency in the household is the most important factor. Parent involvement in their child's education is also a crucial

		or hearing loss, with at least 50 expressive words.	factor. Preserving heritage and cultural identity are just as important as communication in household language.
Soto & Yu (2014)	To review key research in bilingualism in children with communication disorders and discuss relevant needs to the use of AAC strategies and techniques.	Several previous studies on the topic	A sociocultural approach to serving bilingual children with AAC needs should include preservation of cultural and linguistic heritages, the promotion of positive regard for linguistic diversity and evidence of the benefits of bilingualism. This approach is necessary for professionals to understand the needs of bilingual children and their families throughout service delivery.
Xue et al. (2014)	To understand coping strategies, resources of support and positive meanings in raising a child with ASD in an Asian context through the the Family Adjustment and Adaptation Response (FAAR) model as theoretical framework.	65 Singaporean parents of 3- to 11-year-old children with ASD	Coping strategies through family integration and optimism were the most impactful coping strategies, followed by gaining knowledge about ASD from professionals and other families. Collectivist family functioning (rather than individualist) may lead to better coping strategies from the belief that families grow when facing challenges together, thus setting a more

			positive framework for raising a child with ASD.
Drysdale, van der Meer & Kagohara (2015)	A systematic review of eight previous studies that address bilingual language development in children with ASD, along with issues/perceptions of bilingualism in parents of children with ASD.	Eight previous studies conducted on the topic of bilingualism in children with ASD. In total, 182 children with ASD (20 months to 22-years-old) and 62 parents of children with ASD.	There is a discrepancy between the ability of children with ASD to acquire two or more languages and the advice given by professionals about implementing a bilingual environment. All studies showed evidence that bilingualism is not harmful to language development in children with ASD, while majority of parents reported professionals advising against it.
Kay-Raining Bird, Genesee & Verhoeven (2016)	To review research on the following areas of bilingual development in children with ASD: (a) the timing and amount of bilingual exposure (b) outcomes from either direct language intervention or language-in-education placements	Several previous qualitative and quantitative studies on the topic were included in the review.	(a) Simultaneous and sequential bilinguals did not differ from monolingual children with ASD on language or communication abilities, with the exception of one study. Total vocabulary is a better reflection of vocabulary skills in bilingual children than each language separately. The current amount of time a bilingual child is exposed to a particular language has positive correlation with vocabulary and pragmatic abilities,

			whereas lifetime measures of exposure are not. (b) One study revealed effectiveness in treatment done first in L1 and then in L2, improved skills in both languages and in the mother's feeling of competence, but with the lack of experimental controls, further research is needed.
Yu (2016)	An ethnographic case study to examine family members' beliefs, management efforts and actual practices of language use in a bilingual, minority-language family of a child with ASD who committed to speaking English with him, rather than their native language. The study used the framework of family language policy and communicative practice.	A family living in the U.S. for 10 years with a six-year-old boy with ASD from a linguistic background of Mandarin-Chinese. Family members participating were the child, his parents, his paternal grandfather, 10-year-old sister and adult cousin.	The family members switched from speaking Mandarin Chinese to English to their child with ASD 6 months after his diagnosis after receiving advice from an early interventionist that bilingualism could hinder language development. Both parents felt unclear and distressed about making language choices after receiving mixed information from professionals. The mother reported feeling unhappy speaking English to her child, but did so to ensure he would receive services. Findings showed that the child best communicated during interactions that were relevant to the context and sustained his

			attention, regardless of whether it was Mandarin Chinese or English. This suggests a need to view bilingualism between parents and children with ASD as a coordination within a unified pragmatic environment, rather than management of two separate languages.
Gonzalez-Barrero & Nadig (2017)	To investigate the effects of bilingualism on set-shifting and working memory in children with ASD.	20 children with ASD (10 monolingual/10 bilingual) and 20 typically developing children (10 monolingual/10 bilingual). All children were age range 6- to 9-years-old.	Bilingual children with ASD showed advantage over monolingual children with ASD in the set-shifting task observed in the study, but not in daily life tasks, according to parent reports. Working memory was similar for bilingual and monolingual children with ASD. The findings suggest bilingualism might improve some set-shifting skills in children with ASD.
Hampton, Rabagliati, Sorace & Fletcher-Watson (2017)	To investigate what factors influences the language choices of bilingual parents of children with ASD and to compare how these factors would differ in bilingual parents of typically developing children	17 bilingual parents of a child with ASD and 18 bilingual parents of a typically developing child in the U.K.	Parents of children with ASD feared that exposure to two languages could be detrimental to their child's language, cognitive and behavioral development. This was especially true for families whose child with ASD had limited verbal ability.

			However, parents of typically developing children did not report any concerns with bilingual exposure. Parents in both groups emphasized the importance of maintaining their native language to form stronger emotional parent-child bonds and to connect with their cultural heritage.
Hudry et al. (2017)	To examine parent-child interactions in bilingual families using native vs. non-native language.	39 parent-child dyads, each with a young child with ASD, 2- to 6-years-old. 19 parents were bilingual with English as a non-native language, 20 parents were monolingual with English as their native language. All were recruited in the Melbourne, Australia metro area.	Bilingual parent-child interactions showed similar grammatical complexity, synchronous communication and use of scaffolding in both native and non-native languages. Expansions were observed more during bilingual parents' use of non-native English. Monolingual interactions showed more synchrony and use of expansion than bilingual interactions.
Ijalba (2016)	To understand Hispanic immigrant mothers' viewpoints on raising a child with ASD regarding family social environment, cultural beliefs about ASD, and perceptions of bilingualism.	22 Hispanic mothers of preschool children with ASD	Lack of awareness and cultural stigmas about autism led Hispanic mothers to feel social isolation and confusion about language choices. Mothers reported feeling that not being able to speak in Spanish to their child with ASD led to feelings of sadness. Hispanic

			families should be encouraged to speak their native language in the home environment to facilitate strong parent-child bonds. Speech-language-pathologists and other professionals need to learn about Hispanic cultural views and their perceptions of ASD to deliver culturally competent services.
Lund et al. (2017)	A systematic review of literature comparing monolingual to bilingual early language development in children with ASD.	Seven previous research studies that looked at an array of languages and involved young, simultaneously bilingual children with ASD.	Young bilingual and monolingual children with ASD showed similar expressive and receptive language outcomes. Bilingual children showed a slight advantage in vocabulary and monolingual children showed slight advantage in terms of development of first word. Findings suggest that bilingualism does not have a significantly negative effect on language development in young children with ASD.
Nadig & Mulligan (2017)	To investigate if enhanced auditory short-term memory contributes to the learning of novel word forms in children with ASD.	9 children with ASD and 9 typically developing children recruited in Montreal, Canada with 75% exposure to English across settings.	Findings showed evidence of better memory for longer non-words in children with ASD compared to younger typically developing children who were matched on language.

Angulo-Jimenez (2018)	A clinical/parental resource that addresses frequent concerns regarding bilingualism in children with ASD based on current research.	N/A	N/A
DuBay, Watson & Zhang (2018)	To explore how Latino caregivers perceive intervention models, strategies and targets with regards to cultural beliefs.	27 Latino Spanish-speaking (LSS) and 27 non-Latino White (NLW) parents of young children with ASD.	Latino caregivers reported a strong negative stigma with ASD in their culture in which they received criticism and negative judgement from family and friends. Hence, Latino families seek social support elsewhere and prefer certain therapy strategies. Latino families also reported unmet needs from service providers, including lack of open communication and professionalism. Professionals should be prepared to implement culturally modified intervention strategies for Latino children and families.
Gonzalez-Barrero & Nadig (2018)	To look at the impact of amount of language exposure on vocabulary and morphological skills in school-age children with ASD (with no intellectual disabilities).	30 children with ASD and 47 typically developing children in Montreal, Canada, ranging from 4- to 11-years-old.	Current amount of language exposure is the strongest predictor of receptive vocabulary and expressive morphological skills. This reveals a strong correlation between current language exposure and language proficiency.

Summers et al. (2018)	To determine whether a monolingual English treatment condition or a bilingual English/Spanish treatment condition would provide better language outcomes in bilingual children with ASD.	2 bilingual children with ASD who spoke English and Spanish fluently, analyzed between ages 3-8	The two children responded similarly to both monolingual and bilingual treatments, improving language outcomes in both conditions. This suggests that professionals should consider bilingual treatment approaches when working with bilingual children with ASD.
Keller-Bell (2018)	To investigate disparities in the identification and diagnosis of children with ASD from culturally, linguistically and economically diverse backgrounds.	Previous studies on the subject were reviewed.	The percentages of Black and Hispanic children who met ASD criteria were typically evaluated for ASD later in childhood. The findings suggest the need to increase the level of awareness of ASD to reach diverse populations. These efforts will in turn lead to early identification, diagnoses and treatment.
Dai et al. (2018)	To examine language functioning and nonverbal cognitive abilities in bilingually- exposed and monolingually- exposed toddlers with ASD or developmental disorders (DD) before experiencing intervention. In addition, the study looked at the impact of socioeconomic status and	388 young children (average age ~26 months) who failed the M-CHAT and suspected of having ASD or DD. The sample included 282 monolingually-exposed children and 106 bilingually-exposed children.	Children with ASD performed worse than children with DD on all domains of cognitive functioning. Language exposure (monolingual vs bilingual) did not have a main effect on language abilities and nonverbal cognitive functioning for either children with ASD or DD. Results were maintained when controlling for socioeconomic status.

	nonverbal intelligence on language development.		