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# Perspectives on Bilingualism in Persons with Autism Spectrum Disorder in the Rio Grande Valley

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# PERSPECTIVES ON BILINGUALISM IN PERSONS WITH AUTISM SPECTRUM DISORDER IN THE RIO GRANDE VALLEY

A Thesis

by

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# ABSTRACT

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The present study examined the perspectives of both professionals working with individuals with ASD from bilingual households and parents of children with autism spectrum disorder (ASD) from bilingual households regarding bilingualism and ASD. The participants included 37 professionals and 12 parents from the Rio Grande Valley. Data was collected via an online survey. Overall, it was found that majority of the professionals (*n*=16, 62%) have recommended a bilingual approach for a person with ASD from a bilingual household. These recommendations were based on professional expertise, evidence-based studies, carry-over, generalization, patient's progress in therapy and parental report. Furthermore, parents reported to feel supported by professionals when choosing a bilingual approach for their child with ASD (*n*=7, 63%). Moreover, group, level of education and language were found to have a significant effect on some perceptions regarding bilingualism and ASD.

These findings will not only provide fundamental knowledge but will allow for breaking the silence on the topic of perceptions of bilingualism in the field of ASD. Therefore, the outcome of this research is to expand the literature for both parents and professionals, in order for them to make informed decisions about this population, and to encourage the development of bilingual services and support for children with ASD and their family members.

Keywords: autism spectrum disorder, diagnosis, Speech Language Pathologists, parents, professionals, perspectives, Rio Grande Valley

# DEDICATION

The completion of my master's degree would not have been possible without the support of my family, and my boyfriend.

Eternamente agradecida a ustedes, Mamá y Papá, gracias por sus sacrificios para hacer de esta maestría una realidad, sin ustedes nada de esto hubiera sido posible. Gracias a mi hermano y su familia por su apoyo infinito y por estar ahí cuando mas los he necesitado. A Sergio, mi novio, por su inmensa paciencia, apoyo y por motivarme siempre a dar lo mejor de mi.

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TABLE OF CONTENTS

LIST OF TABLES

Page

LIST OF FIGURES

# CHAPTER I

## BACKGROUND

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by impairments in communication development and social interaction, with the presence of restricted or repetitive patterns of behavior, interests or activities (American Psychiatric Association, 2013; Landa 2007; Schechtman, 2007, Szatmari, 2003). ASD may impact an individual's receptive and expressive vocabulary and their pragmatic understanding. Additionally, this population suffers from language delays and language impairments in areas such as phonology and morphosyntax (Boucher, 2012; Eigsti et al., 2017; Wittke et al., 2017).

Even though there are numerous studies that discuss the effects of ASD on language and communication, and the effects on the language and communication abilities of bilingual individuals with ASD. There is still a common misconception in which parents and professionals presume that bilingual exposure can be confusing, complicated and bring forth additional language and social impairments for children with ASD. The misconception that exists about bilingualism is not supported by research, yet decisions are made about language, treatment, and instruction for bilingual children with ASD (August et al., 2010). Moreover, these decisions have led to unfavorable consequences for the individual with ASD and their family members (Petersen et al., 2012; Yu, 2009).

Recent findings suggest that multilingual exposure does not have a negative impact on children with developmental disorders, and in fact could have positive effects in the social and linguistic development of a child (Dai et al., 2018; Drysdale et al., 2015; Uljarevic et al., 2016). In the United States alone over 20 percent of children are raised in homes where languages other than English are spoken, this is nearly 12 million kids (U.S. Census Bureau, 2015; Kids Count, 2016). Marinova-Todd et al. (2016) highlights the need to understand practitioners' perspectives on the intersectionality between ASD and developmental conditions.

The purpose of this study is to investigate the perceptions of professionals and parents regarding bilingualism in individuals with autism spectrum disorder. This information will not only provide fundamental knowledge but will allow for breaking the silence on the topic of perspectives from both professionals and parents regarding bilingualism and ASD. Consequently, the main outcome of this research is to expand the literature for parents and professionals to make informed decisions for this population, to encourage the development of bilingual services and to increase support for children with ASD and their family members.

# CHAPTER II

# LITERATURE REVIEW

## Definition of autism spectrum disorder (ASD)

The description, diagnosis, and understanding of what we know today as autism spectrum disorder (ASD) has been in a state of evolution throughout the years (Volkmar, 2015). The condition was first described by Kanner in 1943, in his report of eleven children with what seemed to be a novel condition characterized by a lack of interest in the social world and a group of behaviors described as being resistive to change (Volkmar & Reichow, 2013).

In the DSM-III autism was included as a class of conditions called pervasive developmental disorder (PDD), the definition was focused on infantile autism. The essential diagnostic features of infantile autism were summarized as a lack of awareness to other people, an impairment in communicative skills, and an unusual response to numerous aspects of the environment (American Psychiatric Association, 1987). Additionally, The DSM-III was the first edition of the DSM to separate autism from schizophrenia.

Then in 1994, the fourth edition of the DSM expanded the subtypes of PDD to include Asperger's disorder, childhood disintegrative disorder and Rett's Disorder. Pervasive Developmental Disorders were usually characterized by impaired social interaction communication and/or stereotyped behavior (Hosseini & Molla, 2012). Moreover, the DSM-IV was the first edition to include a separate classification for Asperger's disorder. The diagnostic criteria for this subgroup were the presentation of slight deficits in delayed language, cognitive

development, and adaptive skills when compared with someone with ASD. Asperger's disorder presented deficits only in the social domains and in the restricted interests or repetitive behaviors (Volkmar et al., 1994).

In conclusion, since the DSM-III, there has been a substantial change in the terminology and classification of autism spectrum disorder (ASD). The modifications include a change in name and a merge of categories previously introduced: Asperger's disorder, childhood disintegrative disorder and PDD-NOS, which were all merged into one term: autism spectrum disorder (King et al., 2014). Decisively, the most current version of the DSM (5) was published in 2013, and it defined autism spectrum disorder as a neurodevelopmental disorder identified by impairments in communication development and social interaction, with the presence of restricted or repetitive patterns of behavior, interests, or activities (American Psychiatric Association, 2013). Autism spectrum disorder is characterized by a spectrum from mild-severe and is ranged in three severity levels: Level 1 defined as requiring support, Level 2 defined as requiring substantial support and Level 3 is defined as requiring very substantial support (American Psychiatric Association, 2013).

Table 1. *DSM-V Diagnostic criteria for autism spectrum disorder (ASD)*

| Severity Level of ASD | Social Communication | Restricted interests and repetitive behaviors (RRB) |
|---|---|---|
| Level 3: Requiring very substantial support | Severe deficits in verbal and nonverbal social communication skills cause severe impairments in functioning, very limited initiation of social interaction and minimal response to social approaches from others | Preoccupations, fixated rituals and/or repetitive behaviors markedly interfere with functioning in all contexts or domains. Marked distress when rituals or routines are interrupted, very difficult to redirect from fixated interests or returns to it quickly. |

| | | |
|---|---|---|
| Level 2: Requiring substantial support | Marked deficits in verbal and nonverbal social communication skills; social impairments apparent even with supports in place; limited initiation of social interactions and reduced abnormal response to social approaches from others | RRB's, preoccupations or fixated interest appear frequently enough to be obvious to the casual observer and interfere with functioning in a variety of contexts. Distress or frustration is apparent when RRB's are interrupted, difficult to redirect from fixated interest. |
| Level 1: Requiring Support | Without supports in place, deficits in social communication cause noticeable impairments. Difficulty in initiating social interactions and shows clear examples of atypical or unsuccessful responses to social approaches of others. May appear to have decreased interest in social interactions. | RRBs cause significant interference with functioning in one or more contexts. Resists attempts by others to interrupt RRB's or to be redirected from fixated interest |

Moreover, the evolution of the definition of autism spectrum disorder throughout the years, there has been confusion and disagreements regarding the updated definition. Due to this, some professionals might not be utilizing the accurate terminology, which is a cause of concern. ASD may impact all aspects of an individual's social abilities, personal interactions, community structure, family functioning, overall communication, emotions, peer interaction, and an overall relationship with others (Johnson & Myers, 2007; Landa, 2007; National Research Council, 2001; Schechtman, 2007; Szatmari, 2003). Additionally, individuals within this population suffer from language delays in receptive vocabulary, phrase understanding, expressive vocabulary, and are affected by language impairments (Baird & Baird, 2003; Kjelgaard & Tager-Flusberg, 2001).

## Prevalence

The Center for Disease Control and Prevention (CDC) estimates that about 1 in 54 eight-year-old children have been identified with autism spectrum disorder. The first studies of the prevalence of autism, which were conducted in the 1960s and 1970s in Europe and the United States, reported prevalence estimates in the range of 2 to 4 cases per 10,000 children, which led to the impression that autism was a rare childhood disorder (Lotter, 1966; Rutter, 2005; Treffert, 1970). In the year 2000, the Autism and Developmental Disabilities Monitoring (ADDM) Network began tracking the prevalence of autism spectrum disorders, and the numbers have consistently increased year after year. The prevalence estimates for the year 2000 were 1 in 150 children whereas in 2012, the estimated prevalence of ASD among 8-year-olds increased dramatically to 1 in 68, and then 1 in 59 in 2014 (Center for Disease Control and Prevention, 2019). The prevalence increased again in 2016 to 1 in 54; when comparing estimates from 2014 and 2016, there has been a 10% increase in the prevalence reported (Center for Disease Control and Prevention, 2016; 2020). The significant increase in prevalence could be due to both increase in awareness and to the evolution of the Diagnostic and Statistical Manual of Mental Disorders (DSM) criteria, from a childhood form of schizophrenia in 1952, to a core diagnosis of a spectrum of disorders in the present (Zeldovich, 2018). Future changes in the diagnostic and reporting practices, as well as modifications to standardized diagnostic instruments will more than likely continue to affect future trends in ASD prevalence estimation and may run counter to the potential effects of the DSM-5 criteria (Maenner et al., 2014). However, accurate numbers are considered difficult to obtain due to possible under or over-identification, lack of biological markers, variations in quality and quantity of behaviors, as well as other factors (Mulvihill et al., 2009).

Autism spectrum disorders occurs in all racial, ethnic, and socioeconomic groups but is about 4 times more common among boys than girls. Likewise, some authors have hypothesized that ASD traits may be "camouflaged" in females and that current diagnostic procedures may be biased against females thus resulting in underdiagnosing them (Kirkovski et al., 2013; Lai et al., 2016). Furthermore, ASD prevalence estimates for non-Hispanic (white), non-Hispanic black (black), and Asian/Pacific Islander children were approximately identical (18.5, 18.3, 17.9%), however for Hispanic children the prevalence estimate was 15.4% in the United States (Maenner et al., 2016). While the CDC found no difference in prevalence rates between black and white children, a gap remains in prevalence among Hispanic children, which indicated a need to expand screening and intervention among this group (Autism Speak, 2020). The continued discrepancy between groups could be due to stigma, lack of access to healthcare services and the patient's language being other than English (Hodges et al., 2020).

## Causes

As of yet, we do not know the cause(s) of autism spectrum disorder, but we have learned that the disorder could be a cause of genetic, biological and/or environmental factors. Many scientists agree that genes are one of the risk factors that could make a person more likely to develop ASD (Huguet & Bourgeron, 2013). Given that we know that autism spectrum disorder is more common in boys than in girls, there is a possibility that there is a link to the X chromosome (Chakrabarti & Fombonne, 2005). Additionally, hereditary factors can be traced to more than 50% of autism spectrum disorder cases and thus the genetic essence of ASD has been identified in family and twin studies (Gaugler et al., 2014). Also, children born to older parents are at higher risk for having ASD (Durkin et al., 2008; Gao et al., 2020).

Furthermore, individuals with certain genetic or chromosomal conditions, such as fragile X syndrome, tuberous sclerosis, down syndrome, Rett syndrome, among others, are at greater risk for having ASD. When having an abnormal genetic code, there could also be a possibility of atypical brain development, which could cause cognitive and neurobiological abnormalities or even characteristic behaviors of ASD (Williams, 2012).

Neurological abnormalities can include an increase in gray matter in the frontal and temporal lobes along with cortical alterations, differences in the cerebellar structure and connectivity (Courchesne et al., 2011), abnormalities in the limbic system, and subtle malformations (Ecker et al., 2013). Previous literature has found that young patients with autism spectrum disorder have shown abnormally enlarged neurons in the cerebellar nuclei, inferior olive, and vertical limb of the diagonal band of Broca's (Kemper & Bauman, 1998). Changes in the ASD brain have been investigated recently, another study found increased number of neurons in the prefrontal cortex in the brain of ASD children (Hashem et al., 2020). Generally, pathology has suggested that there is a restricted brain pattern development in ASD individuals (Zikopoulos & Barbas, 2010). An fMRI study revealed that ASD individuals had reduced activation of higher-order social (fusiform, cingulate, amygdala, gyrus, insula) and executive processing (prefrontal cortex) of the brain and higher activation of lower-order structures that are involved in the intervention of primary motor and sensory processing during emotional task performance (Noonan et al., 2009; Sauer et al., 2012; Safar et al., 2018).

Lastly, researchers have also investigated environmental factors that could be a possibility for the development of autism spectrum disorder. There is evidence that the critical period for developing ASD occurs before, during and immediately after birth (Gardener et al., 2011). Thus, there could be factors such as diet, exposure to drugs and environmental toxics that

could interact with genetic vulnerability to ASD. In a study conducted, birth complications that are associated with trauma or ischemia and hypoxia showed strong links to ASD (Moddabernia et al., 2017).

## Bilingual Populations

Bilingualism has been defined as the use of two or more languages (American Speech Language Hearing Association, 2014; Baker, 2011; Bhatia & Ritchie, 2006). Bilingualism is a multidimensional characteristic that is influenced by multiple factors such as sociolinguistic context, age of acquisition, amount of exposure, usage (for children) or proficiency (for older children and adults), among others (Surrain & Luk, 2017). When speaking about bilingualism, the term *majority language* is used to refer to the language spoken by the majority of individuals in a given community, while the terms *minority, home*, or *heritage* language refer to the language spoken by a minority of speakers in a given community.

For many bilingual speakers, their languages are closely linked to the culture associated to each language they speak (Kremer-Sadlik, 2005). In 2018, the Census Bureau data reported a record 66.6 million U.S. residents (native-born, legal immigrants, and illegal immigrants) spoke a language other than English at home. This number has more than doubled since 1990 and almost tripled since 1980. There are now more people who speak Spanish at home in the United States than in any country in Latin America, with the exception of Mexico, Colombia, and Argentina (Zeigler, 2019). Hence, this number is expected to continue rising year by year and it is estimated by the U.S. Census Bureau that by 2050, the U.S. will have 138 million Spanish speakers (Hernández-Nieto & Gutierrez, 2017). Comparably, 59.9 million people make up the Hispanic population of the United States as of July 1, 2018, making people of Hispanic origin the nation's largest ethnic or racial minority.

Hispanics constitute 18.3% of the nation's total population (U.S. Census Bureau, 2015), and according to the 2002 National Survey of Latinos, 46% of Hispanic adults speak both English and Spanish. In Texas alone, it was reported by the American Community Survey (ACS) 2009-2013 multi-year data, that of the nearly 24 million people in Texas five years or older, 65% spoke only English at home and the rest of the people spoke more than 160 languages combined, with Spanish being the most popular language spoken in the homes (U.S. Census Bureau, 2015). Thus, the number of bilingual Texas households is growing and so are the challenges associated with providing educational and healthcare services to this increasingly diverse state population. These concerns not only include the neurotypical population but the neurodiverse population as well. Bilingually exposed children with autism spectrum disorders (ASD) are those who are exposed to two languages from early ages. These children are typically being raised in bilingual families and/or bilingual communities (Gonzalez-Barrero & Nadig, 2020). Although there is substantial evidence to support bilingualism in children with typical development, parents and professionals are still fearful of speaking more than one language with children who have specific language impairments and other developmental disabilities (Yu, 2013).

Correspondingly, Speech-Language Pathologists (SLPs) in the United States are seeing a rise in their caseload of culturally and linguistically diverse (CLD) clients. In 2016, only 6.5% of American Speech-Language-Hearing Association (ASHA) members identify themselves as bilingual service providers. Spanish-English bilingual SLPs constitute 4.41% of the overall bilingual service providers and 2.1% of bilingual providers speak languages other than Spanish. We not only have a need for skilled service providers, but those who possess the self-efficacy to work with clients from diverse linguistic and cultural backgrounds (Santhanam & Parveen, 2018).

## ASHA's Perspective on Bilingualism

The American Speech-Language Hearing Association (2004) defines bilingualism as "the use of at least two languages by an individual". Bilingualism is defined by the variability in the proficiency of two languages due to the amount of exposure to the language and the varying opportunities to practice the two languages. It is also defined as self-motivated and a fluid process across different domains such as experiences, tasks, topics, and time (Pot et al., 2019).

Given that bilingualism have variabilities depending on the person, much of the variety could be attributed to the method in which the language is or has been learned. Thus, clinicians must be prepared to address the unique situation of each client. A proposal by ASHA states that when determining what language will be utilized for intervention among bilinguals, the general recommendation is that the stronger language be utilized as the language of intervention (ASHA, 1985, 2004, 2005, 2011; Kohnert, 2010).

Furthermore, as indicated in the Code of Ethics, audiologists and speech language pathologists are obligated to provide culturally and linguistically appropriate services to their clients and patients, regardless of the clinician's personal culture, practice setting, or caseload demographics. The Code of Ethics is in place, to ensure that the highest quality of service is provided to all patients (ASHA, 2016). ASHA's Principle of Ethics I, Rule C states that "individuals shall not discriminate in the delivery of professional services" and on Principle II, Rule A "individuals shall engage in only those aspects that are within the scope of their professional practice and competence". Therefore, speech language pathologists should continue their lifelong learning to develop the appropriate knowledge and skills to provide culturally and linguistically appropriate services.

Moreover, ASHA defines cultural and linguistic competence as a set of behaviors, attitudes, and policies that come together in a system, agency, or among professionals that enable effective work in cross-cultural situations and involves understanding to the unique combination of those cultural variables. ASHA's document *Issues in Ethics: Cultural and Linguistic Competence* also states that proficient care is providing service that is respectful and responsive to an individual's values, preferences, and language thus competent services to all populations and the recognition of their cultural and linguistic experiences are required (ASHA, 2013). Not only does ASHA urges practitioners to show respect of the cultural and linguistic preferences of their patients, they also ethically bind clinicians to be culturally competent and considerate of cultural and language differences in their practice (Smith et al., 2018).

Although there is an increasing number of bilingual speakers in the U.S., there is limited information about the clinician's preparedness to provide services to bilingual speakers and about clinician's self-confidence and attitudes about such services. In 2016, only 6.5% of American Speech-Language-Hearing Association (ASHA) members identified themselves as bilingual service providers and of these individuals, 64.9% were Spanish-language services providers (Santhanam & Parveen, 2018). In general, both monolingual and bilingual SLPs continue to report that they feel inadequately competent to support the unique needs of patients of diverse background. Professionals working in the area of communication and language disorders have not always felt competent with how to work with bilingual families (D'Souza et al., 2012; Moore & Perez-Mendez, 2006). In a survey conducted by Kritikos (2003), SLPs mentioned they felt somewhat competent in assessing bilingual clients and that they attributed the sense of competence to three reasons: first, their personal experiences in a diverse background; second, their knowledge and awareness of their limitations in working with

culturally language diverse clients and third, their willingness to seek out assistance when needed. Consequently, ASHA has been actively creating more educational resources, supporting research endeavors, and assisting university programs to prepare a competent next generation of SLPs (Santhanam & Parveen, 2018).

## Findings on Bilingualism and ASD

Discoveries in the literature have concluded that there is no evidence to support the idea that being bilingual will result in additional language delays for children with primary language impairments (Gutiérrez-Clellen et al., 2008; Korkman et al., 2012; Paradis et al. 2003), down syndrome (Feltmate & Kay-Raining Bird, 2008), or ASD (Drysdale et al., 2015; Hambly & Fombonne, 2012; Park, 2014; Petersen et al., 2012; Valicenti-McDermott et al., 2012) when compared with their monolingual peers. Moreover, Sen and Geetha (2011) suggested that bilingualism had neither a positive nor a negative effect on language abilities in children with ASD. They also concluded that parent's language choice is influential in children with ASD, and it was established that caregivers should be encouraged to speak their home-language to ensure high-quality social and language input during their child's language development. These findings were then supported by Hambly and Fombonne (2012), who found that there was not a significant difference between the skills of children with ASD raised in a simultaneous vs. a sequential bilingual environment. Hence, they concluded that caregivers should not be discouraged from speaking two languages to their children nor be afraid of introducing a new language.

Moreover, Petersen et al. (2012) found that bilingually exposed three- to seven-year-old children with ASD had greater total production vocabularies compared to monolingual subjects. Furthermore, bilingually exposed toddlers with ASD showed higher adaptive functioning than monolingually exposed toddlers with ASD and showed greater gains in total gesture use (Valicenti-McDermott et al., 2012). Reetzke et al. (2015) examined the association between bilingual exposure and pragmatic language development in 54 Chinese children with ASD and they reported that bilingual language exposure was not associated with additional challenges for the development of the dominant language in children with ASD. Likewise, Ifigeneia and Savvas (2020), found that a bilingual child developed his phonological abilities, receptive and expressive vocabulary, verbal and non-verbal pragmatic abilities as well as his cognitive abilities quicker when compared to a monolingual child. These authors concluded that children with ASD have the potential to be bilingual without a disadvantage in their language development.

In retrospect, bilingual toddlers and preschool children with ASD were found to reach language milestones, such as first words and onset of first sentences, at a similar age as their monolingual peers with ASD (Valicenti-Mcdermott et al., 2013). Findings showed that these individuals developed their expressive and receptive vocabulary and language (Hambly & Fombonne, 2012; Petersen et al., 2013), pragmatic abilities (Reetzke et al., 2015), and cognitive functioning (Valicenti-Mcdermott et al., 2013) at a similar rate to that of children with ASD exposed to only one language (Dai et al., 2018, Hategan & Talas, 2014; Ohashi et al., 2012; Petersen et al., 2012; Sen & Geetha, 2011).

Additional case studies were found, in which benefits from bilingual treatment in children with ASD were discussed. For example, Yu (2016) noticed that a bilingual Chinese-English speaking 5-year-old boy with ASD was found to utilize conversational code switching

during the case study. Summers et al. (2017) compared a monolingual English treatment to a bilingual treatment for two English-Spanish bilingual children with ASD; the participants made gains in both conditions, but it was found that the bilingual treatment was effective in improving language outcomes and in fact did not harm the child's language skills. Seung et al. (2006) studied the progress of a three-year-old bilingual boy with ASD during two years of a Korean-English bilingual speech-language intervention, and they found marked improvement in the child's expressive and receptive language along with nonverbal communication such as increased eye contact and decreased maladaptive behaviors. Lang et al. (2011) found that a four-year-old with ASD from a Spanish-speaking household was more successful at following directions and had fewer challenging behaviors when the treatment was provided in Spanish than when it was administered in English. Likewise, Seung et al. (2006) found that a speech-language intervention provided in the family's native language was effective in helping the child with ASD to make progress towards treatment goals and to develop the English language. Children with ASD may require more opportunities to hear and use their home language, especially those who receive more exposure to the dominant language (Paradis & Govindarajan 2018).

Therefore, it was concluded that a bilingual environment does not disadvantage nor hinder children with ASD in early stages of language development. There is no evidence to suggest that children with severe disabilities are unable to successfully become bilingual (Park, 2014; Ohashi et al., 2012; Wharton et al., 2000). However, while there are studies recommending practitioners to motivate parents to speak their native language at home, Kay-Raining et al. (2012) found that parents raised concerns in choosing bilingualism when they did not have enough bilingual resources, services or supports about whether their child would be able to learn two languages.

Moreover, current studies have found that young individuals with ASD have reported being more satisfied with their social life and their social quality of life. Digard et al., (2020) investigated the perceptions of 297 adults, this sample included 89 monolingual English speakers, 98 bilinguals and 110 multilinguals. Respondents with proficiency in two or more languages rated their social life as more satisfactory than their monolingual peers, additionally social quality of life was higher for the multilingual group when compared with the bilingual people. This is one of the first studies to reveal the range and complexity of language learning among people with ASD and has shown how many of these participants learned one or more languages at school or independently and use the languages moderately as many people without ASD do.

## One-language approach

Since ASHA has emphasized the importance of bicultural and bilingual service delivery, the understanding of bilingual language acquisition and language instruction models are imperative for speech-language pathologists as they continue to see an increase in bilingual children on their caseloads. Speech Language Pathologists must make fundamental clinical decisions as determining an individual's language proficiency and which language(s) to utilize during the treatment intervention. Still, a clear consensus has not been established among professionals about the selection of appropriate language(s) use in intervention when working with children with ASD (Kay-Raining Bird et al., 2012).

Although there has not been a clear agreement, clinicians and educators regularly recommend that bilingual parents expose their children with autism spectrum disorders (ASD) to only one language, despite the current research on bilingualism and children with ASD (Pilar-Trelles & Castro, 2020; Hampton et al., 2017; Hudry et al., 2018). Hence, many professionals

fear that dual-language exposure could contribute to additional challenges and delays in language development, and they often advise bilingual families of children with ASD to focus on the language of schooling and to refrain from using the family's native language to avoid language confusion or further language delays (Seung et al., 2006; Yu, 2009; Jegatheesan et al., 2011; Bird et al., 2011; Park, 2014).

Typically, the recommended language is English, as it is the dominant language of education and treatment services in the United States (Park, 2014). Bilingual parents of children with ASD often report that most, if not all, of their educational and interventional services are provided in English, and that primary language alternatives are not available (Kay- Raining Bird et al., 2012; Mueller et al. 2006; Yu, 2009). Monolingual recommendations are often supported by a logically sounding rationale that centers on the next assumptions. First, that a bilingual individual must recognize that a single concept needs to be represented by two or more labels across languages. Second, children with ASD have impaired joint attention that help map word labels to the proper stimulus. Therefore, bilingualism could lead to delays in acquisition of receptive and expressive vocabulary in both languages (Parish-Morris et al., 2007; Hambly & Fombonne, 2012). Thus, the practice of advising bilingual parents of children with ASD to speak in a single language is often grounded on logical arguments and assumptions rather than empirical evidence (Lim et al., 2018).

Although determining language dominance and choosing a primary language for intervention is important and valued, it should not mean that the other language(s) should be disregarded. Professionals might not realize that when they recommend a one-language approach in the home, they might be harming the child's childhood by limiting their social experiences to only a specific group of people who speak the English language. Thus, professionals might be

reducing the opportunities for the child to learn how to coexist within their cultural communities since languages are often closely linked to cultural identities (Jegatheesan et al., 2011). It can also hinder the development of multicultural perception and identity, which is very important for children with ASD (Howard et al., 2019). Therefore, the commonly held belief that bilingualism is too confusing and even unreasonable to expect of children with ASD has led to unfavorable outcomes for a child with ASD and youth from bilingual families (Petersen et al., 2012, Yu, 2009, 2013).

Additionally, this misconception has led to practitioners advising parents to concentrate on one language to support a child's language development (Moore and Perez-Mendez, 2006). Furthermore, the literature review is consistent on discussing the parents' perspectives on the effects in the upbringing of a child with ASD in a bilingual household. Many families report consistently being discouraged from raising their child bilingually and in fact they have reported a lack of adequate support for their bilingual families, (Kay-Raining Bird et al., 2012; Kremer-Sadlik, 2005; Yu, 2013). Parents of bilingual children with ASD are being advised to use only one language (predictably English) due to fears that the bilingual exposure would cause the child more confusion and further impairments or negative effects on the child's communication skills and language. (Jegatheesan, 2011; Kremer-Sadlik, 2005; Wharton et al., 2000; Yu, 2013).

Given these recommendations, many parents follow through and try to teach their child an English-only approach. But when they do, they report that they have a harder time in making an emotional family connection with their child since they cannot talk to each other in their native language (Wharton et al. 2000; Park, 2014). Limiting the child to only language, might lead to an invisible disconnection from the society as the child may find it difficult to communicate with peers or adults who do not know the language that the child speaks.

Professionals in the field of early intervention and education of children with ASD must consider no longer encouraging for a single language only (English) approach, as it can lead to detrimental effects to the development of social language (Sendhilnathan & Chengappa, 2020).

Additionally, parents with limited English proficiency express more stressful and unnatural interactions with their child (Wharton et al., 2000; Yu, 2013) while parents of bilingual children who spoke their native language to them expressed a more natural, relaxed and intimate interaction with their child when they used their native language instead of English (Kay-Raining Bird et al., 2012). This is consistent with the findings of Wharton et al. (2000) who found that communication, social interaction and emotional involvement were enhanced when the native language was used during interactions as well as an increased length of interaction and improved emotional attachment. Some parents of bilingual children with ASD have reported that they understand and value the importance of English acquisition, but that they continue to have concerns regarding the complete elimination of their native language (Yu, 2013). Moreover, some parents who reside in highly bilingual areas feel that bilingualism can increase their child's opportunities. However, regardless of receiving erroneous advice from professionals to use an English-only approach with their child with ASD, many parents have reported that they are unable to follow this recommendation due to limited English proficiency (Kay-Raining Bird et al., 2012; Kremer-Sadlik, 2005; Wharton el al., 2000; Yu, 2013).

# CHAPTER III

## RESEARCH QUESTIONS AND HYPOTHESES

The purpose of the present study is to investigate the perceptions of

1) Professionals regarding bilingualism in individuals with ASD,

2) Parents regarding bilingualism in individuals with ASD.

Particularly, the following research questions were addressed:

1. What are the perceptions of professionals regarding bilingualism in individuals with ASD?
2. What is the professional's reasoning when recommending a monolingual or a bilingual approach for a person with ASD?
3. What are the perceptions of parents regarding bilingualism in individuals with ASD?
4. Is there a difference in perceptions between parents and professionals regarding bilingualism in individuals with ASD?

It was hypothesized that:

1. The professionals will advise parents to use a monolingual approach, and to reinforce the language that is spoken the most in the community.

2. The professionals' reasoning will be based on their own perspectives of ASD and bilingualism due to lack of consistency of recommendations between practitioners and limited bilingual resources.
3. The parents of individuals with ASD will therefore utilize a monolingual approach as advised by professionals, and due to lack of bilingual support and resources.
4. There will be a difference in perceptions between parents and healthcare professionals regarding bilingualism and ASD, given the literature review that supports parents wanting to maintain their native language in the home (Robertson et al., 2014; Marinova-Todd et al., 2016; Howard et al., 2021).

# CHAPTER IV

# METHOD

## Participants

### Professionals

Recruitment of participants began after permission was obtained from the University of Texas at Rio Grande Valley's Social and Behavioral Sciences Institutional Review Board (IRB) (See Appendix A). An e-mail list was compiled consisting of healthcare practitioners and education professionals in the Rio Grande Valley that may want to participate in the study. The e-mails were obtained from public records, organization websites and public social media groups. An e-mail was sent to the professionals describing the research study and requesting participation. If the individual was interested in participation, he/she was sent an E-mail containing the link to complete consent to participate in the study and the specific survey questions through Qualtrics.

The following healthcare and education practitioners were recruited for participation in this study:

1. Board Certified Behavior Analysts
2. Medical Doctors
3. Occupational Therapists
4. Speech-Language Pathologists
5. Special Education Teachers
6. Teachers

The decision to include these specific professionals was made because these professionals work closely with individuals with autism spectrum disorder and their families, and they provide recommendations for the patient's best care. Likewise, this multi-disciplinary team contains a variety of professionals (e.g., medical doctors, teachers, psychologists, counselors, speech and language pathologists, occupational therapists, and early childhood specialists) is recommended as the gold standard for diagnosis of ASD (Center for Disease Control and Prevention, 2018).

The inclusion criteria for participation in the study was the following:

1. Licensed health care practitioner or professional in one of these fields: general medicine, pediatrics, neurology, psychiatry, neuropsychology, psychology, early childhood, education, counseling, speech and language pathology, occupational therapy, physical therapy, and/or behavior analysis.
2. Current practice in the Rio Grande Valley, Texas, United States.

3. Had/have a caseload of individuals with the diagnosis of autism spectrum disorder, aged 0-22 years, who are from a bilingual household or that have been exposed to more than one language.

The data set included 51 hits for the professionals' survey, however 3 were deleted due to not meeting the participant's criteria by residing outside of the Rio Grande Valley, Texas, moreover 10 surveys were left blank, therefore the final usable sample was 38 practitioners. A total of 38 responses were recorded for the practitioner survey.

**Parents**

Recruitment of participants began after permission was obtained from the University of Texas at Rio Grande Valley's Social and Behavioral Sciences Institutional Review Board (IRB) (See Appendix A). Likewise, e-mail addresses of parents were obtained through the support of outside organizations such as TEAM MARIO, public records, organization websites and public social media groups. (See Appendix B and C). If the individual was interested in participation, he/she was sent an E-mail containing the link to complete consent to participate in the study and the specific survey questions through Qualtrics.

The inclusion criteria for participation in the study was the following:

1. Parent of an individual with ASD.
2. Currently resides in the Rio Grande Valley.
3. Expose their child to a bilingual household/native language.

A total of 13 hits were included for the parents' data set, 2 surveys were left blank, therefore a total of 11 responses were recorded for the parents' survey.

## Survey Procedure

To gain an understanding of the perceptions of professionals and parents, two surveys were created through the use of Qualtrics Software. These surveys were created by a thorough search of existing surveys and literature review. Upon completion of survey a panel of experts, composed of faculty from rehabilitation fields, professors, clinicians, alumni and faculty members from the Communication Sciences and Disorders department were asked to review the survey and provide feedback. Upon their feedback, changes were made if necessary. Once completed, the pilot implementation with one or two individuals for each survey was performed to measure duration of the survey time and their perception of the study. The survey was then emailed to the professionals and parents, e-mail addresses of parents were obtained through the support of two outside organizations and e-mail addresses of the professionals were obtained through public records, organization websites and through the University of Texas Rio Grande Valley resources.

The instructions and consent form on the email script informed the participants about confidentiality of the survey, and anonymous responses. Also included were the instructions that answers were voluntary and that participants could end participation if needed, the survey was provided in English or Spanish dependent on the participants primary language. The author translated the instrument from English to Spanish then a panel of three experts including an educator and two clinicians provided feedback. The educator, who is bilingual, translated back to English to verify there were no major discrepancies from original to translation. The survey aimed for the professionals consisted of 3 sections: *Demographics, Caseload, and Perspectives on Bilingualism.* And the survey aimed for the parents consisted of 3 sections: *Demographics, Perspectives on Bilingualism, and Perspectives regarding professional's advice and support.*

## Survey for Professionals

### Demographics

The demographics section consisted of ten questions that gathered demographic information regarding the participants' gender, age, ethnicity, and languages spoken. A total of 37 participants took part in the present study. Most participants were female (*n*=32, 91.43%), the rest of the participants was encompassed by 3 male participants (*n*=3, 8.57%) and 2 participants who did not disclose their gender/sex. The largest pool of participants self-identified as White (*n*=30, 81.08%), while 6 participants identified as Other (*n=6,* 16.22%) and 1 participant identified as Asian (*n*=1, 2.7%). The mean average age was 32, with a range from 24 to 67 years.

A total of 26 participants (70.27%) reported their highest level of education was a master's degree, 6 participants reported having obtained a bachelor's degree (*n*=6, 16.22%), 3 participants with a doctoral or professional degree (*n*=3, 8.11%), 1 subject reported having some college (*n=1*, 2.7%) and 1 participant selected having a high school degree (*n*=1, 2.7%). The highest influx of professionals reported were Speech Language Pathologists (*n*=21, 56.76%), additionally a total of 5 participants reported being Teachers (*n*=5, 13.51%), 4 participants reported being Occupational Therapists (*n*=4, 10.81%), 3 participants reported being Special Education Teachers (*n*=3, 8.11%), 2 participants reported being Medical doctors (*n*=2, 5.41%) and 2 participants described to be Other, which then they specified as 1 school counselor and 1 SLP, BCBA (*n*=2, 5.41%).

The participants were asked to report their work setting. A total of 15 participants reported currently working at a school district setting (*n*=15, 40.54%), while 14 participants reported working in the clinic setting (*n*=14, 37.84%). The remaining minority of participants

reported working in a home health setting (*n*=2, 5.41%), a hospital (*n*=2, 5.41%), a private practice (*n*=1, 2.70%) and Other, such as a SNF or outpatient rehab (*n*=3, 8.11%).

The participants were asked to indicate the city (or cities) where they provided services. Majority of the participants reported working in Brownsville (*n*=13, 23.21%). Furthermore, a total of 11 participants reported working in the McAllen area (*n*=11, 19.64%). A total of 6 participants reported working in the Edinburg area (*n*=6, 11.71%), the Mission area (*n*=6, 11.71%) and Other areas such as Donna, Elsa, San Juan or Alamo (*n*=6, 11.71%). A total of 5 participants worked in the Pharr area (*n*=5, 8.93%), and the Weslaco area (*n*=5, 8.93%). A minority of the participants worked in Harlingen (*n*=1, 1.79%), Hidalgo (*n*=1, 1.79%), Mercedes (*n*=1, 1.79%), and the Rio Grande City areas (*n*=1, 1.79%).

The participants were asked what language was spoken in the work environment. To which, a total of 33 participants reported speaking Spanish (*n*=33, 43.42%), aside from speaking English (*n*=37, 48.68%) and 6 participants reported utilizing American Sign Language as well (*n*=6, 7.89%). Participants were then asked to rate how fluent they were in the English and Spanish language. A total of 36 participants stated they felt their English language was very fluent (*n*=36, 100%). In comparison, when the participants rated their Spanish language a total of 25 participants stated their Spanish was very fluent (*n*=25, 67.57%). Moreover, 8 participants rated their Spanish as somewhat fluent (*n*=8, 21.62%) and 4 participants identified themselves as not being fluent in the Spanish language (*n*=4, 10.81%).

**Caseload**

A total of two questions were obtained regarding the presence of patients with ASD and bilingual patients in the professionals' caseload. The participants were asked to report the caseload inclusion of individuals with ASD in their work environment. A total of 18 participants

reported to have a caseload of 1-5 patients/students with ASD diagnosis (*n*=18, 50.0%), 10 participants reported having a caseload of 15 or more patients with ASD diagnosis (*n*=10, 27.78%), while the remaining participants reported having a caseload of 6-10 patients (*n*=4, 11.11%) or 11-15 patients (*n*=4, 11.11%) with an ASD diagnosis. When participants were asked what their caseload of bilingual individuals during the past 2 years was, a total of 17 participants reported having a caseload of 15 or more bilingual patients/students (*n*=17, 47.22%). While 8 participants reported having 1-5 bilingual patients/students (*n*=8, 22.22%), 6 participants reported having 6-10 bilingual patients/students (*n*=6, 16.67%) and 5 participants stated having 11-15 bilingual patients/students in their caseload (*n*=5, 13.89%).

Table 2. *Demographic information for professionals in the Rio Grande Valley*

| Demographics | *n*= | % |
|---|---|---|
| Age | | |
| 21-30 | 18 | 50% |
| 31-40 | 14 | 38.9% |
| 41-50 | 4 | 11.1% |
| Race | | |
| American Indian/Alaskan Native | 0 | 0% |
| Asian | 1 | 2.7% |
| Black/African American | 0 | 0% |
| Native Hawaiian/Pacific Islander | 0 | 0% |
| White | 30 | 81.1% |
| Other | 6 | 16.2% |
| Sex | | |
| Female | 32 | 91.4% |
| Male | 3 | 8.6% |
| Education | | |
| Bachelor's | 6 | 16.2% |
| Doctoral/Professional Degree | 3 | 8.11% |
| High school graduate | 1 | 2.70% |
| Master's | 26 | 70.3% |
| Some college | 1 | |
| Profession | | |
| Board Certified Behavior Analyst | 0 | 0% |
| Medical Doctor | 2 | 5.41% |

| | | |
|---|---|---|
| Occupational Therapist | 4 | 10.81% |
| Physical Therapist | 0 | 0% |
| Psychologist | 0 | 0% |
| Special Education Teacher | 3 | 8.11% |
| Speech Language Pathologist | 21 | 56.76% |
| Teacher | 5 | 13.51% |
| Other: School Counselor, SLP-BCBA | 2 | 5.41% |
| Setting | | |
| Clinic | 14 | 37.84% |
| Home Health | 2 | 5.41% |
| Hospital | 2 | 5.41% |
| Private Practice | 1 | 2.7% |
| School District | 15 | 40.54% |
| Other: SNF, outpatient | 3 | 8.11% |
| City providing services | | |
| Brownsville | 13 | 23.31% |
| Edinburg | 6 | 10.71% |
| Harlingen | 1 | 1.79% |
| Hidalgo | 1 | 1.79% |
| La Feria | 0 | 0% |
| McAllen | 11 | 19.64% |
| Mercedes | 1 | 1.79% |
| Mission | 6 | 10.71% |
| Pharr | 5 | 8.93% |
| Rio Grande City | 1 | 1.79% |
| San Benito | 0 | 0% |
| Weslaco | 5 | 8.93% |
| Other (Alamo, Donna, Elsa, San Juan) | 6 | 10.71% |
| Language spoken | | |
| English | 37 | 48.68% |
| Very fluent | 36 | 100% |
| Somewhat fluent | 0 | 0% |
| Not Fluent | 0 | 0% |
| Spanish | 33 | 43.42% |
| Very fluent | 25 | 67.57% |
| Somewhat fluent | 8 | 21.62% |
| Not fluent | 5 | 10.81% |
| American Sign Language | 6 | 7.89% |
| Caseload ASD Diagnosis | | |
| 1-5 patients | 18 | 50% |
| 6-10 patients | 4 | 11.11% |
| 11-15 patients | 4 | 11.11% |
| 15 or more | 10 | 27.78% |
| Caseload of bilingual patients | | |
| 1-15 patients | 8 | 22.2% |
| 6-10 patients | 6 | 16.67% |

| | | |
|---|---|---|
| 11-15 patients | 5 | 13.89% |
| 15 or more | 17 | 47.22% |

Note: *Participants were able to select more than one answer for the question regarding city providing services, and language.*

## Survey for Parents

### Demographics

The demographics section consisted of twelve questions that gathered demographic information regarding the participants' gender, age, race, sex, level of education, and languages spoken. Information regarding their child's level of Autism, method of communication and interactions in different languages was also examined. A total of 12 participants took part in the present study. Majority of the participants were female (*n*=11, 91.67%), with the addition of 1 male participant (*n*=1, 8.33%). The largest pool of participants self-identified as White (*n*=8, 66.67%), while 3 participants identified as Other (*n*=3, 25%) and 1 participant identified as Asian (*n*=1, 8.33%). The mean average age was 38 with a range from 30 to 48 years.

A total of 5 participants (*n*=5, 41.67%) reported their highest level of education was some college, while 4 participants reported having a bachelor's degree (*n*=4, 33.3%) and 3 participants stated having a master's degree (*n*=3, 25%). Next, the participants were asked where they resided, a total of 5 participants reported living in the Edinburg area (*n*=5, 41.67%) while the remaining participants reported living in the Mission (*n*=2, 16.67%), Pharr (*n*=2, 16.67%), Harlingen (*n*=1, 16.67%), McAllen (*n*=1, 8.33%), and Weslaco area (*n*=1, 8.33%).

Participants were asked what language was spoken in the home environment. A total of 6 participants reported to speaking English only (*n*=6, 50%), while a total of 6 participants reported speaking both English and Spanish (*n*=6, 50%). When asked how fluent the

participants were in the English language, 9 self-identified as being very fluent (*n*=9, 81.82%), while 2 participants identified as being somewhat fluent (*n*=2, 18.18%) and 1 participant chose not to respond. When the participants were asked how fluent they were in the Spanish language, a total of 6 participants reported being very fluent (*n*=6, 54.55%), 2 participants identified as being somewhat fluent (*n*=2, 18.18%), 3 participants reported being not fluent (*n*=3, 27.27%) and 1 participant chose not to respond. Consequently, the participants were asked whether they felt comfortable in speaking and teaching English to their child, a total of 11 participants reported that yes, they felt comfortable (*n*=11, 100%). When participants were asked how they would rate their interactions with their child when speaking the English language at home, a total of 6 participants reported they would rate it as average (*n*=6, 54.55%), 3 participants rated their interaction as excellent (*n*=3, 27.27%) and 2 participants rated their interactions as poor (*n*=2, 18.18%).

When asked with what level of autism their child had, a total of 6 parents reported that their child was on a Level 1 (requiring support) of ASD diagnosis (*n*=6, 50%), while 5 participants reported a Level 2 (requiring substantial support) (*n*=5, 41.67%) and 1 participant reported their child was on a Level 3 (requiring very substantial support) (*n*=1, 8.33%). Participants were then asked what their child's method of communication was, to which the majority of participants reported that their child communicated verbally (*n*=8, 73.73%), 2 participants reported that their child used a total communication approach by selecting all of the above (*n*=2, 18.18%) and 1 participant reported that their child communicated via an Augmentative and Assistive Communication Device (Low-Tech, High-tech) (*n*=1, 9.09%).

Table 3. *Demographic information for parents in the Rio Grande Valley*

| Demographics | *n=12* | % |
|---|---|---|
| Age | | |
| 21-30 | 0 | 0% |
| 31-40 | 9 | 75% |
| 41-50 | 3 | 25% |
| Race | | |
| American Indian/Alaskan Native | 0 | 0% |
| Asian | 1 | 8.3% |
| Black/African American | 0 | 0% |
| Native Hawaiian/Pacific Islander | 0 | 0% |
| White | 8 | 66.7% |
| Other | 3 | 25% |
| Sex | | |
| Female | 11 | 91.7% |
| Male | 1 | 8.3% |
| Education | | |
| Bachelor's | 4 | 33.3% |
| Doctoral/Professional Degree | 0 | 0% |
| High school graduate | 0 | 0% |
| Master's | 3 | 25% |
| Middle school | 0 | 0% |
| Some college | 5 | 41.7% |
| City residence | | |
| Brownsville | 0 | 0% |
| Edinburg | 5 | 41.7% |
| Harlingen | 1 | 8.3% |
| Hidalgo | 0 | 0% |
| La Feria | 0 | 0% |
| McAllen | 1 | 8.3% |
| Mercedes | 0 | 0% |
| Mission | 2 | 16.7% |
| Pharr | 2 | 16.7% |
| Rio Grande City | 0 | 0% |
| San Benito | 0 | 0% |
| Weslaco | 1 | 8.3% |
| Other | 0 | 0% |

| | | |
|---|---|---|
| Language spoken | | |
| English | 6 | 48.7% |
| Very fluent | 9 | 81.8% |
| Somewhat fluent | 2 | 18.2% |
| Not Fluent | 0 | 0% |
| Spanish | 0 | 0% |
| Very fluent | 6 | 54.6% |
| Somewhat fluent | 2 | 18.2% |
| Not fluent | 3 | 27.3% |
| Both English and Spanish | 6 | 50% |
| American Sign Language | 0 | 0% |
| Level of ASD child was diagnosed | | |
| Level 1 (requiring support) | 6 | 50% |
| Level 2 (requiring substantial support) | 5 | 41.7% |
| Level 3 (requiring very substantial support) | 1 | 8.3% |
| I don't know. I have never been informed. | 0 | 0% |
| Child's method of communication | | |
| Augmentative and Assistive Comm. Device | 1 | 9.1% |
| American Sign Language (ASL) | 0 | 0% |
| Verbal | 8 | 2.7% |
| All of the above | 2 | 18.2% |
| Interactions in English language | | |
| Excellent | 3 | 27.3% |
| Average | 6 | 54.6% |
| Poor | 2 | 18.2% |
| Not applicable | 0 | 0% |

## Analytical Plan

Once the participants completed the survey, it was submitted anonymously on Qualtrics. Through use of descriptive statistics, the participant's frequency of responses and central tendencies such as mean was analyzed. The data collected was analyzed through use of quantitative analysis on Qualtrics and Microsoft Excel. A qualitative descriptive statistical analysis of the survey results was utilized to analyze research questions one and two, which aimed to find the practitioners' perceptions and reasoning regarding bilingualism and ASD.

Likewise, a qualitative descriptive statistical analysis was utilized for research question three, which aims to analyze the parents' perceptions regarding bilingualism and ASD. An analysis of variance (ANOVA) was utilized for research question four, which aims to find whether there are differences in perceptions between the participants.

# CHAPTER V

# RESULTS

This chapter presents the descriptive analysis of data collected from each group of the participant's responses.

## Descriptive Analysis of Professionals' Perceptions

This section consisted of eight Likert scale questions regarding the professional's views in regard to ASD and bilingualism. An additional two multiple choice questions of their recommendations to this population, and two text entry qualitative questions that obtained their professional opinion and how their decisions may be influenced. These questions were generated because of the gap in the literature review between professional's perspectives and parent's perspectives. Parents have reported lack of support from professionals in teaching their child with ASD their native language. Additionally, a review study indicated that many practitioners would like to support bilingualism in children with developmental disabilities when relevant for families but that the lack of bilingual specialized services and educational opportunities is a major obstacle (Marinova-Todd et al., 2016).

A Likert- scale ranging from *strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, and strongly agree* was used to assess the participants' self-perceptions to indicate how strong they agreed to eight different statements. A total of 26 participants out of the 37 participated in this area of the Survey. The participants were asked to rate their perception to the statement: "A person with ASD benefits from a one-language only which facilitates language learning and use". A total of 5 participants stated they strongly disagreed (*n*=5, 18.52%), while 5 participants stated they somewhat disagreed (*n*=5, 18.52%), 6 of the participants stated to neither agree nor disagree (*n*=6, 22.22%), 9 of the participants stated to somewhat agree (*n*=9, 33.33%), and 2 of the participants stated to strongly agree (*n*=2, 7.41%).

Furthermore, when the participants were asked to rate the perception "A monolingual approach is the best fit for a person with ASD from a bilingual household". A total of 1 participant stated to strongly disagree (*n*=11, 42.31%), while 4 participants stated to somewhat disagree (*n*=4, 15.38%), 3 participants stated to neither agree nor disagree (*n*=3, 11.54%), 5 participants stated to somewhat agree (*n*=5, 19.23%), and 3 participants stated to strongly agree (*n*=3, 11.54%). Consecutively, the participants were asked their perception to the statement "A bilingual approach is the best fit for a person with ASD from a bilingual household". A total of 0 participants strongly disagreed (*n*=0, 0%), 1 participant reported to somewhat disagree (*n*=1, 3.85%), 7 participants neither agreed nor disagreed (*n*=7, 26.92%), 9 of the participants reported to somewhat agree (*n*=9, 34.62%), and 9 of the participants reported to strongly agree (*n*=9, 34.62%). The participants were then asked to rate the statement "Bilingualism can cause more delays for a person with ASD". A total of 10 participants reported to strongly disagree (*n*=10,

38.46%), 6 of the participants reported to somewhat disagree (*n*=6, 23.92%), 8 of the participants reported to neither agree nor disagree (*n*=8, 30.77%), 2 of the participants reported to somewhat agree (*n*=2, 7.69%) and 0 participants reported to strongly agree (*n*=0, 0%).

Moreover, the participants were asked to rate the statement "Bilingualism can cause confusion for a child with ASD". A total of 9 participants reported to strongly disagree (*n*=9, 34.62%), 7 participants reported to somewhat disagree (*n*=7, 26.92%), 7 of the participants reported to neither agree nor disagree (*n*=7, 26.92%), 3 of the participants reported to somewhat agree (*n*=3, 11.54%) and 0 participants reported to strongly agree (*n*=0, 0%). Additionally, the participants were asked to rate the statement: "A child with ASD from a bilingual household is able to speak both languages". A total of 1 participant reported to strongly disagree (*n*=1, 3.85%), 2 of the participants reported to somewhat disagree (*n*=2, 7.69%), 6 of the participants reported to neither agree nor disagree (*n*=6, 23.08%), 11 of the participants reported to somewhat agree (*n*=11, 42.31%), and 6 participants strongly agreed (*n*=8, 23.08%). Then the participants were asked to rate the statement: "A child with ASD from a bilingual household is able to understand both languages". A total of 0 participants reported to strongly disagree (*n*=0, 0%), 1 participant reported to somewhat disagree (*n*=1, 3.85%), 2 of the participants reported to neither agree nor disagree (*n*=2, 7.69%), 10 of the participants reported to somewhat agree (*n*=10, 38.46%), and 13 participants strongly agreed (*n*=15, 50%). When the participants were asked to rate the statement: "There are enough bilingual service providers and resources". A total of 11 participants reported to strongly disagree (*n*=11, 40.74%), 9 of the participants reported to somewhat disagree (*n*=9, 33.3%), 2 of the participants reported to neither agree nor disagree (*n*=2, 7.41%), 3 of the participants reported to somewhat agree (*n*=3, 11.1%) and 2 participants strongly agreed (*n*=2, 7.41%).

Participants were then asked whether they had recommended a monolingual approach for a person with ASD from a bilingual household. The answer choices provided were yes, no and never. The never option was provided to visualize whether the participants had been in a situation to recommend this approach. A total of 14 participants reported not having recommended a monolingual approach ($n$=14, 11.54%), while 3 participants said they have ($n$=3, 11.54%) and a total of 9 participants mentioned they had never recommended a monolingual approach ($n$=9, 34.62%). Consequently, the participants were asked whether they had recommended a bilingual approach for a person with ASD from a bilingual household. The same answer choices were provided. A total of 16 participants mentioned they had recommended a bilingual approach ($n$=16, 61.54%), while a total of 5 participants mentioned they have not ($n$=5, 19.23%) and a total of 5 participants mentioned they have never recommended a bilingual approach to a person with ASD form a bilingual household ($n$=5, 19.23%). Conclusively, the participants were then asked to type their professional opinion as to the language parents should speak to their child with ASD from a bilingual household. Three broad themes were obtained from the qualitative open-ended questions, these included: Bilingualism, Individualized recommendation, and Monolingualism. A total of 24 out of the 26 participants contributed to this section of the Survey.

**Theme I: Bilingualism**

Bilingualism has been defined as the use of two or more languages (American Speech Language Hearing Association, 2014; Baker, 2011; Bhatia & Ritchie, 2006). Bilingually exposed children with autism spectrum disorders (ASD) are those who are exposed to two languages from early ages (Gonzalez-Barrero & Nadig, 2020). A total of 11 professionals

commented on how both languages should be taught, and they included a variety of ways or settings where the child could practice the languages. For example, a participant suggested that "parents continue providing the best model to the child, and that the practitioner will provide training in relation to functional words that the child is communicating so parents may be aware", an additional recommendation from a previous professional included: "code switching and using words from both languages to make communication functional". Further recommendations included: "both languages used in the household for maximum language exposure". Likewise, a participant stated "students are at school for 8+ hours where the English language is practiced in speaking, reading, and writing. At home, Spanish can be practiced with parents and grandparents".

Furthermore, a participant emphasized the importance of culture and close relationships with family members, the entry stated: "students I have worked with are aware of their cultural backgrounds and embrace the language, because they can communicate with the people that they feel the most comfortable within their families". This statement resonates with the findings from Jegatheesan et al. (2011), they reported that languages are "often closely linked to cultural identities". Besides, if children are not taught one of the household languages by parents or by intervention providers, they will inevitably be excluded from the opportunities that engaged dialogue provides for the improvement of their social skills (Kremer-Sadlik, 2005; Uljarević et al., 2016).

**Theme II: Individualized Recommendation**

To individualize is defined as "to adapt to the needs or special circumstances of an individual" (Merriam Webster, 2021). In this theme of individualized recommendations, 7 participants recommended an approach based on the person with ASD from a bilingual

household. One of the participants suggested “the individual should use a total communication approach (visuals, gestures, vocalizations, AAC) to encourage communication”, another participant recommended to “model both languages, but to take a patient-centered approach and build-off the patient’s strengths”. Other participants mentioned that their recommendation would “depend on the exposure the child has been provided, or the level of understanding the child is showing when comparing skills of both languages of exposure”.

**Theme III: Monolingual Recommendation**

This theme topic was anticipated due to the previous literature review mentioning parents and providers are sometimes concerned that exposure to two languages will impair language acquisition in children with autism spectrum disorder (ASD) or other developmental disorders (DD) (Dai et al., 2018). Thus, childcare providers from a wide range of disciplines share this belief and recommend that parents of children with neurodevelopmental disorders speak only one language when communicating with their children (Beauchamp & MacLeod, 2017; Ijalba, 2016; Kay-Raining Bird et al., 2012; Kremer-Sadlik, 2005; Yu, 2013). In this survey data set, 4 participants suggested that the child with ASD should speak one language. A participant suggested “to speak the language that is primarily being spoken in the academic environment” while another participant suggested “the most common language in the household.” Overall, the participants in this theme agreed to a one-language approach and to “stick to one language on a consistent basis”. These findings are consistent with the findings from Moore and Perez-Mendez (2006), which state that practitioners often advise parents to concentrate on one language to support a child’s language development. However, with little research specific to bilingualism in children with ASD, professionals struggle to develop informed language recommendations for these children (Drysdale et al., 2015).

Overall, the findings from Themes I, II, and II suggest that there is in fact no clear consensus from professionals in the field regarding their recommendations for bilingual exposure in ASD (Wang et al., 2108; Smith et al., 2018; Hampton et al., 2017; Hudry et al., 2018; Trelles & Castro, 2019). Nevertheless, more awareness and education are needed in this topic to avoid conflicting views and recommendations. The participants were similarly asked to type what influences their professional opinion as to the language parents should speak to their child with ASD from a bilingual household. Three broad themes were obtained from the data, these were: Professional background, Previous experiences and Personal point of view. A total of 23 out of the 26 participants contributed to this section of the Survey.

**Theme I: Professional Background**

A total of 5 participants referred to their professional background when making decisions about bilingualism and ASD, participants mentioned that what influences their opinion is "professional expertise, evidence-based studies, experience, their SLP background or profession, best practices recommended at ASHA conventions, and referring to language acquisition".

**Theme II: Previous Experiences**

Majority of the participants fit in this Theme, a total of 13 participants reported previous experiences are what influence their opinions regarding bilingualism and ASD. A participant reported that "generalization in the academic environment and home setting along with patient's progress within therapy" is an important factor. Another sub-theme was noticed where participants referred to previous experiences with their caseload of people with bilingual ASD students/patients. Two participants suggested parent reporting, and the parent's language is an important factor when deciding bilingualism and ASD. Overall, participants referred to their

previous experiences with children with ASD from bilingual households and the individualized experience of each patient/student, for example “the child’s automatic response to the language”, what the child understands/speaks best” and “how there’s a lot of situations that affect this decision including parent proficiency and functional level”.

**Theme III: Personal Point of View**

In this theme, 5 participants reported a personal account which influence their decision making about bilingualism and ASD. A participant mentioned being a mother of a child with ASD, another mother to a bilingual child who is learning both languages was reported. A participant stated that “not being fluent in English limits work and educational opportunities which is an unnecessary barrier for someone with ASD” while another participant mentioned “Students with ASD are smart and are capable of speaking two languages at the same time. Yes, maybe it will take them longer, but they are highly intelligent and can speak two languages fluently. Especially if that’s what they’ve known since they’re young. These findings are similar to the findings from Howard et al. (2020) which founds that some practitioners mentioned that bilingual development could take longer for a child with ASD but was nonetheless possible. Furthermore, findings from this same study showed there were practitioners who mentioned that bilingualism could be confusing for a child with ASD, but it was mostly dependent on the language profile of the individual child (Howard et al., 2020).

## Descriptive Analysis of Parents' Perceptions

### Perspectives on Bilingualism

This section consisted of nine Likert scale questions, which aimed to assess the attitudes of parents regarding their child's bilingualism and their point of views regarding support from professionals. Some of these questions were inspired by Hampton et al. (2017), since in this research study parents expressed a type of burden regarding their child's bilingualism, and they also reported professional advice that was sometimes at odds with their own assessments of their child's needs. A scale ranging from *strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, and strongly agree* was used to assess the participants' self-perceptions to indicate how strong they agreed to nine different statements. A total of 11 participants out of the 12 participated in this section of the Survey.

When the participants were asked their perception about the statement "I keep communication simple for my child since two languages seem to be challenging", 1 participant ($n$=1, 10%) stated to strongly disagree, 2 participants somewhat disagreed ($n$=2, 20%), 0 participants neither agreed nor disagreed ($n$=0, 0%), 3 participants somewhat agreed ($n$=3, 30%), 4 participants strongly agreed ($n$=4, 40%), and 1 participant decided not to answer to this particular statement. Then the participants were asked whether they agreed to the perception "bilingualism (speaking two languages) will cause my child to be more confused", a total of 4 participants strongly agreed ($n$=4, 36.36%), 2 participants somewhat agreed ($n$=2, 18.18%), 2 participants neither agreed nor disagreed ($n$=2, 18.18%), 3 participants somewhat agreed ($n$=3, 27.27%), and 0 participants strongly agreed to this statement ($n$=0, 0%). When the participants were asked to rate the statement "bilingualism will cause more delays in my child's language", 3

participants stated to strongly disagree (*n*=3, 27.27%), 1 participant somewhat agreed (*n*=1, 9.09%), 3 participants neither agreed nor disagreed (*n*=3, 27.27%), 3 participants somewhat agreed (*n*=3, 27.27%), and 1 participant strongly agreed (*n*=1, 9.09%). Furthermore, the participants were then asked to rate the statement "bilingualism is an additional burden for my child". A total of 3 participants strongly disagreed (*n*=3, 27.27%), 5 participants somewhat disagreed (*n*=5, 45.45%), 2 participants neither agreed nor disagreed (*n*=2, 18.18%), 0 participants somewhat agreed (*n*=0, 0%), and 1 participant strongly agreed (*n*=1, 9.09%).

The participants were asked to rate the statement "One language is the only option for my child to actually learn a language", a total of 4 participants strongly disagreed (*n*=4, 36.36%), 4 participants somewhat disagreed (*n*=4, 36.36%), 2 participants neither agreed nor disagreed (*n*=2, 18.18%), 1 participant somewhat agreed (*n*=1, 9.09%), and 0 participants strongly agreed (*n*=0, 0%). When participants were asked to rate the perception "My child understands both English and Spanish", a total of 0 participants stated to strongly disagree (*n*=0, 0%), 1 participant somewhat disagreed (*n*=1, 9.09%), 1 participant neither agreed nor disagreed (*n*=1, 9.09%), 8 participants somewhat agreed (*n*=8, 72.73%), and 1 participant strongly agreed (*n*=1, 9.09%). Consecutively, the participants were asked to rate the statement "My child speaks both English and Spanish" and a total of 5 participants strongly disagreed (*n*=5, 45.45%), 4 participants somewhat disagreed (*n*=4, 36.36%), 0 participants neither agreed nor disagreed (*n*=0, 0%), 1 participant somewhat agreed (*n*=1, 9.09%), and 1 participant strongly agreed (*n*=1, 9.09%).

Then, the participants were asked to rate the perception "Professionals are supportive about speaking to my child in his/her native language", to which 1 participant stated to strongly disagree (*n*=1, 9.09%), 0 participants somewhat disagreed (*n*=0, 0%), 1 participant neither agreed nor disagreed (*n*=1, 9.09%), 2 participants somewhat agreed (*n*=2, 18.18%), and 7

participants strongly agreed (*n*=7, 63.64%). When participants were asked to rank the statement "there are enough bilingual services and resources available", a total of 2 participants strongly disagreed (*n*=2, 18.18%), 1 participant somewhat disagreed (*n*=1, 9.09%), 2 participants neither agreed nor disagreed (*n*=2, 18.18%), 3 participants somewhat agreed (*n*=3, 27.27%), and 3 participants strongly agreed (*n*=3, 27.27%).

**Perspectives regarding professional's advice and support**

This area consisted of two Likert scale questions which aimed to gather information regarding professional advice in one or two languages, two additional multiple-choice questions were included to specify the type of practitioner that advised this. Parents have reported to have been discouraged by practitioners (both educational and professionals) to maintain their heritage language (Baker, 2013; Yu, 2009, 2016). Parent responses from interviews included: "the pediatrician said the child was confused with two languages", "utilizing more English was suggested by the daycare", "when the child received his ASD diagnosis, his SLP recommended using English" (Paradis & GovinDarajan, 2018).

Parents were then to rate the statement "professionals have advised me to use only one language at home", to which a total of 9 participants were obtained. Of these 5 participants reported to strongly disagree (*n*=5, 55.56), 0 participants somewhat disagreed (*n*=0, 0%), 3 participants neither agreed nor disagreed (*n*=3, 33.33%), 0 participants somewhat agreed (*n*=0,0%), and 1 participant strongly agreed (*n=1*, 11.11%), 2 participants did not respond to this question. When asked what professional advised a one-language approach, 1 participant reported a Board-Certified Behavior Analyst recommended this (*n*=1, 11.11%), 2 participants reported a Medical Doctor (*n*=2, 22.22%), 2 participants reported a Teacher (*n*=2, 22.22%), a Psychologist

(*n*=1, 11.11%), a Special Education teacher (*n*=1, 11.11%), a Speech Language Pathologist (*n*=1, 11.11%), and 1 participant reported Other (n=1, 11.11%).

Moreover, the participants were asked to rate the statement "professionals have advised me to use both languages at home, to which a total of 10 participants were obtained. A total of 2 participants reported to strongly disagree (*n*=2, 20%), a total of 0 reported to somewhat disagree (*n*=0, 0%), 4 participants reported to neither agree nor disagree (*n*=4, 40%), 1 participant somewhat agreed (*n*=1, 10%), and 3 participants strongly agreed to the statement (*n*=3, 30%). Consecutively, when asked which professional has advised a two-language approach a total of 11 responses were obtained. A total of 1 participant reported a Board-Certified Behavior Analyst recommended this (*n*=1, 9.09%), 2 participants reported an Occupational Therapist (*n*=2, 18.18%), a Special Education teacher (*n*=1, 9.09%), 3 participants reported a Speech- Language Pathologist (*n*=3, 27.27%), 3 participants reported a Teacher had recommended this approach (*n*=3, 27.27%), and 1 participant reported Other (*n*=1, 9.09%).

## Analysis of Variance Relating to Participants' Perceptions

### Perspectives relating to perceptions relating to ASD and Bilingualism

In order to answer the fourth research question, is there a difference in perceptions between parents and healthcare professionals with regards to bilingualism in individuals with ASD., participants were placed into two groups. These groups were made with the participants who answered the Likert-scale survey questions regarding perceptions of bilingualism and ASD. Out of 37 professional participants only 26 responded the perception questions, and out of 12 parent participants 11 participants responded the perception questions regarding ASD and bilingualism. Group 1 consisted of professionals (*n*=26) and Group 2 consisted of parents

(*n*=11). More specifically, Group 1 Consisted of 14 Speech-Language Pathologists, 4 teachers, 3 occupational therapists, 2 medical doctors, and 1 special education teacher. These groups were made only to analyze the independent variable for group and their effect on the perceptions of bilingualism and ASD.

Therefore, a series of between-subjects analysis of variance (ANOVA) were conducted. The following independent variables were examined for their effect on perception of ASD and bilingualism: group (parent or professional), age, gender, profession (for professionals only), level of education, and language. The dependent variables included the following perceptions: (1) A person with ASD benefits from a simplified linguistic input (one-language only), which facilitates learning and use. (2) Bilingualism can cause more delays for a child with ASD. (3) Bilingualism can cause confusion for a child with ASD. (4) A child with ASD from a bilingual household is able to speak both languages. (5) A child with ASD from a bilingual household is able to understand both languages, and (6) There are enough bilingual service providers and resources.

**Group (Parent or professional)**

Table 4. *ANOVA results for the effect of group on perspectives relating to ASD and bilingualism*

| Source of Variation | SS | df | MS | F |
|---|---|---|---|---|
| Group Pers 1 | 7.515 | 1 | 7.515 | 3.940* |
| Within group error b | 66.755 | 35 | 1.907 | |
| Total | 74.270 | 36 | | |
| | | | | |
| Group Pers 2 | 4.247 | 1 | 4.247 | 3.268 |
| Within group error b | 45.483 | 35 | 1.300 | |
| Total | 49.730 | 36 | | |

| | | | | |
|---|---|---|---|---|
| Group Pers 3 | 0.340 | 1 | 0.340 | |
| Within group error b | 43.930 | 35 | 1.255 | 0.271 |
| Total | 44.270 | 36 | | |
| | | | | |
| Group Pers 4 | 23.155 | 1 | 23.155 | 17.963* |
| Within group error b | 45.115 | 35 | 1.289 | |
| Total | 68.270 | 36 | | |
| | | | | |
| Group Pers 5 | 2.155 | 1 | 2.155 | 3.504 |
| Within group error b | 21.521 | 35 | 0.615 | |
| Total | 23.676 | 36 | | |
| | | | | |
| Group Pers 6 | 14.373 | 1 | 14.373 | 8.897* |
| Within group error b | 56.545 | 35 | 1.616 | |
| Total | 70.919 | 36 | | |

*p<.05.

There was a significant effect of group use ($F(1, 35)=3.94$, $p=0.05$) on perception 1: "A person with ASD benefits from a simplified linguistic input (one-language only), which facilitates learning". Professionals were less likely to agree (M=2.92, SD=1.29) with perception 1 than parents (M=3.91, SD=1.58). Moreover, there was a highly significant effect of group use ($F(1,35)=17.96$ , $p= <.001$) on perception 4: "A child with ASD from a bilingual household is able to speak both languages". Professionals (M=3.73, SD=1.04) were more likely to agree with perception 4 (M=2.0, SD=1.34) than parents (M=2.0, SD=1.34). Furthermore, there was a significant effect on group use ($F(1, 35)=8.9$, $p=.005$) on perception 6: 'There are enough bilingual service providers and resources". Professionals (M=2.0, SD=1.2) were less likely to agree with perception 6 than parents (M=3.4, SD=1.5). Additionally, there was no significant effect of group use ($F(1,35)=3.27$, ($p=.08$) on perception 2: "Bilingualism can cause more delays for a person with ASD", perception 3: "Bilingualism can cause confusion for a child with ASD" ($F(1,35)=0.271$, $p=.61$), or on perception 5: "A child with ASD from a bilingual household is able to understand both languages" ($F(1,35)=3.5$, $p=.07$).

**Age**

Table 5. *ANOVA results for the effect of age on perspectives relating to ASD and bilingualism*

| Source of Variation | SS | df | MS | F |
|---|---|---|---|---|
| Age Pers 1 | 9.829 | 3 | 3.276 | 1.678 |
| Within group error b | 64.441 | 33 | 1.953 | |
| Total | 74.270 | 36 | | |
| | | | | |
| Age Pers 2 | 4.200 | 3 | 1.400 | 1.015 |
| Within group error b | 45.529 | 33 | 1.380 | |
| Total | 49.730 | 36 | | |
| | | | | |
| Age Pers 3 | 2.491 | 3 | 0.830 | |
| Within group error b | 41.779 | 33 | 1.266 | 0.656 |
| Total | 44.270 | 36 | | |
| | | | | |
| Age Pers 4 | 8.422 | 3 | 2.807 | 1.548 |
| Within group error b | 59.848 | 33 | 1.814 | |
| Total | 68.270 | 36 | | |
| | | | | |
| Age Pers 5 | 1.034 | 3 | 0.345 | 0.502 |
| Within group error b | 22.642 | 33 | 0.686 | |
| Total | 23.676 | 36 | | |
| | | | | |
| Age Pers 6 | 10.478 | 3 | 3.493 | 1.907 |
| Within group error b | 60.441 | 33 | 1.832 | |
| Total | 70.919 | 36 | | |

*p<.05.

There was no significant effect of age ($F(3,33)=1.68$, $p=0.19$) on perception 1: "A person with ASD benefits from a simplified linguistic input (one-language only), which facilitates learning, perception 2: "Bilingualism can cause more delays for a person with ASD" ", ($F(3,33)=1.01$, $p=0.399$), perception 3: "Bilingualism can cause confusion for a child with ASD" ($F(3, 33)= 0.66$, $p=0.585$), perception 4: "A child with ASD from a bilingual household

is able to speak both languages" ($F(3,33)= 1.55$, $p=0.221$), perception 5: "A child with ASD from a bilingual household is able to understand both languages($F(3,33)= 0.502$, $p= 0.683$), or perception 6: 'There are enough bilingual service providers and resources" ($F(3,33)= 1.907$, $p=0.148$).

**Gender**

Table 6. ANOVA results for the effect of gender on perspectives relating to ASD and bilingualism

| Source of Variation | SS | df | MS | F |
|---|---|---|---|---|
| Gender Pers 1 | 3.395 | 2 | 1.698 | 0.814 |
| Within group error b | 70.875 | 34 | 2.085 | |
| Total | 74.270 | 36 | | |
| Gender Pers 2 | 0.730 | 2 | 0.365 | 0.253 |
| Within group error b | 49.000 | 34 | 1.441 | |
| Total | 49.730 | 36 | | |
| Gender Pers 3 | 2.020 | 2 | 1.010 | |
| Within group error b | 42.250 | 34 | 1.243 | 0.813 |
| Total | 44.270 | 36 | | |
| Gender Pers 4 | 0.52 | 2 | .026 | 0.13 |
| Within group error b | 68.219 | 34 | 2.006 | |
| Total | 68.270 | 36 | | |
| Gender Pers 5 | 1.676 | 2 | 0.838 | 1.295 |
| Within group error b | 22.000 | 34 | 0.647 | |
| Total | 23.676 | 36 | | |
| Gender Pers 6 | 0.450 | 2 | 0.225 | 0.109 |
| Within group error b | 70.469 | 34 | 2.073 | |
| Total | 70.919 | 36 | | |

*$p<.05$.

There was no significant effect of gender ($F(2,34)=0.814$, $p=0.451$) on perception 1: "A person with ASD benefits from a simplified linguistic input (one-language only), which facilitates learning", perception 2: "Bilingualism can cause more delays for a person with ASD" ($F(2,34)=0.253$, $p=0.778$), perception 3: "Bilingualism can cause confusion for a child with ASD" ($F(2, 34)= 0.813$, $p=0.452$), perception 4: "A child with ASD from a bilingual household is able to speak both languages" ($F(2,34)=0.013$, $p=0.987$), perception 5: "A child with ASD from a bilingual household is able to understand both languages($F(2,34)= 1.295$, $p= 0.287$), and on perception 6: 'There are enough bilingual service providers and resources" $F(2,34)= 0.109$, $p=0.897$).

**Professions**

Table 7. *ANOVA results for the effect of profession (for professionals only) on perspectives relating to ASD and bilingualism*

| Source of Variation | SS | df | MS | F |
|---|---|---|---|---|
| Profession Pers 1 | 1.572 | 5 | 0.314 | 0.156 |
| Within group error b | 40.274 | 20 | 2.014 | |
| Total | 41.846 | 25 | | |
| Profession Pers 2 | 6.322 | 5 | 1.254 | 1.295 |
| Within group error b | 19.524 | 20 | 0.976 | |
| Total | 25.846 | 25 | | |
| Profession Pers 3 | 6.027 | 5 | 1.205 | |
| Within group error b | 21.357 | 20 | 1.068 | 1.129 |
| Total | 27.385 | 25 | | |
| Profession Pers 4 | 0.592 | 5 | 0.118 | 0.089 |
| Within group error b | 26.524 | 20 | 1.326 | |
| Total | 27.115 | 25 | | |
| Profession Pers 5 | 0.611 | 5 | 0.122 | 0.160 |
| Within group error b | 15.274 | 20 | 0.764 | |

| | | | | |
|---|---|---|---|---|
| Total | 15.885 | 25 | | |
| Profession Pers 6 | 5.226 | 5 | 1.045 | 0.727 |
| Within group error b | 28.774 | 20 | 1.439 | |
| Total | 34.000 | 25 | | |

*$p$<.05.

There was no significant effect of profession on perception 1: "A person with ASD benefits from a simplified linguistic input (one-language only), which facilitates learning" ($F$(5,20)=0.156, $p$=0.976), perception 2: "Bilingualism can cause more delays for a person with ASD" ($F$(5,20)=1.295, $p$=0.305), perception 3: "*Bilingualism can cause confusion for a child with ASD"* ($F$(5, 20)= 1.129, $p$=0.377), perception 4: "A child with ASD from a bilingual household is able to speak both languages" ($F$(5,20)=0.089, $p$=0.993), perception 5: "A child with ASD from a bilingual household is able to understand both languages ($F$(5,20)= 0.160, $p$= 0.974) or perception 6: 'There are enough bilingual service providers and resources" $F$(5,20)=0.727, $p$=0.612).

**Level of Education**

Table 8. *ANOVA results for the effect of level of education on perceptions relating to ASD and bilingualism*

| Source of Variation | SS | df | MS | F |
|---|---|---|---|---|
| Education Pers 1 | 16.937 | 3 | 5.646 | 3.250* |
| Within group error b | 57.333 | 33 | 1.737 | |
| Total | 74.270 | 36 | | |
| Education Pers 2 | 4.771 | 3 | 1.590 | 1.167 |
| Within group error b | 44.958 | 33 | 1.362 | |
| Total | 49.730 | 36 | | |
| Education Pers 3 | 6.562 | 3 | 2.187 | 1.914 |
| Within group error b | 37.708 | 33 | 1.143 | |

| | | | | |
|---|---|---|---|---|
| Total | 44.270 | 36 | | |
| Education Pers 4 | 15.437 | 3 | 5.146 | 3.214* |
| Within group error b | 52.833 | 33 | 1.601 | |
| Total | 68.270 | 36 | | |
| Education Pers 5 | 5.301 | 3 | 1.767 | 3.173* |
| Within group error b | 18.375 | 33 | 0.557 | |
| Total | 23.676 | 36 | | |
| Education Pers 6 | 11.419 | 3 | 3.806 | 2.111 |
| Within group error b | 59.500 | 33 | 1.803 | |
| Total | 70.919 | 36 | | |

*$p$<.05.

There was a significant effect of level of education ($F$(5,20)=3.250, $p$=0.034 ) on perception 1: "A person with ASD benefits from a simplified linguistic input (one-language only), which facilitates learning". Participants with a bachelor's degree were more likely to agree (M=4.5, SD=0.93), followed by participants with a High School Education (M=3.0, SD=0), and participants with a Ph.D./Doctoral (M=3.0, SD=1.15), therefore the participants with a master's were less likely to agree to this perception compared to the previous levels of education mentioned. (M=2.83, SD=1.43). Additionally, there was a significant effect of level of education ($F$(5,20)= 3.214, $p$=0.035) on perception 4: "A child with ASD from a bilingual household is able to speak both languages". Participants with a High School degree (M=5.0, SD=0) were more likely to agree with this perception, followed by participants with a master's degree (M=3.54, SD=1.18), and participants with a Ph.D. (M=3.22, SD=1.377). The participants with a bachelor's degree were the less likely to agree with this perception (M=2.13, SD=1.25) compared to the other levels of education. Likewise, there was a significant effect of level of education ($F$(5,20)= 3.173, $p$= 0.037) on perception 5: "A child with ASD from a bilingual household is able to understand both languages. Participants with a High School Degree (M=5,

SD=0), a master's degree (M=4.38, SD=0.65) and a Ph.D./Doctor's degree (M=4.25, SD=0.50) were more likely to agree with this perception compared to participants with a bachelor's degree (M=3.5, SD=1.07).

There was no significant effect of level of education on perception 2: "Bilingualism can cause more delays for a person with ASD" *F(*5,20)=1.167, 0.337), perception 3: "Bilingualism can cause confusion for a child with ASD" (*F(*5, 20)= 1.914, *p*=0.146) or on perception 6: 'There are enough bilingual service providers and resources" (*F(*5,20)=2.111 *p*=0.118).

**Language**

Table 9. *ANOVA results for the effect of language use on perspectives relating to ASD and bilingualism*

| Source of Variation | SS | df | MS | F |
|---|---|---|---|---|
| Language Pers 1 | 9.435 | 2 | 4.718 | 2.474 |
| Within group error b | 64.835 | 34 | 1.907 | |
| Total | 74.270 | 36 | | |
| Language Pers 2 | 0.470 | 2 | 0.235 | 0.162 |
| Within group error b | 49.260 | 34 | 1.449 | |
| Total | 49.730 | 36 | | |
| Language Pers 3 | 0.395 | 2 | 0.198 | 0.153 |
| Within group error b | 43.875 | 34 | 1.290 | |
| Total | 44.270 | 36 | | |
| Language Pers 4 | 2.330 | 2 | 1.165 | 0.601 |
| Within group error b | 65.940 | 34 | 1.939 | |
| Total | 68.270 | 36 | | |
| Language Pers 5 | 1.011 | 2 | 0.505 | 0.758 |
| Within group error b | 22.665 | 34 | 0.667 | |
| Total | 23.676 | 36 | | |
| Language Pers 6 | 12.279 | 2 | 6.139 | 3.560* |
| Within group error b | 58.640 | 34 | 1.725 | |
| Total | 70.919 | 36 | | |

*$p<.05$.

There was a significant effect of language ($F(2,34)=3.560$, $p=0.039$ on perception 6: 'There are enough bilingual service providers and resources". Participants who used English-only at work/home (M=3.5, SD=0.95) were more likely to agree than participants who used both English and Spanish at home/work (M=2.12 SD=1.45) or participants who used English, Spanish and ASL at home/work (M=2.0, SD=0.82).

There was no significant effect of language on perception 1: "A person with ASD benefits from a simplified linguistic input (one-language only), which facilitates learning" ($F(2,34)=2.474$, $p=0.99$), perception 2: "Bilingualism can cause more delays for a person with ASD".$F(2,34)=0.162$ $p=0.851$, perception 3: "Bilingualism can cause confusion for a child with ASD"($F(2, 34)= 0.153$ $p=0.859$), perception 4: "A child with ASD from a bilingual household is able to speak both languages" ($F(2,34)=0.601$, $p=0.554$) or on perception 5: "A child with ASD from a bilingual household is able to understand both languages($F(2,34)= 0.758$, $p= 0.476$).

# CHAPTER VI

# DISCUSSION

The purpose of the current research study was to analyze the perceptions of professionals and parents regarding bilingualism in people with ASD. Understanding this information is important in order to fill in the gap between perceptions of practitioners and family members of people with ASD, thus providing both with crucial information regarding the factors that affect the perspectives relating to ASD and bilingualism. In addition, the results obtained in this study provide descriptive information pertaining to the practitioners' reasoning when recommending a monolingual or a bilingual approach. Most importantly, the results obtained provided information regarding a significant difference between practitioner and family member's perceptions.

The first research question addressed the practitioners' perceptions regarding bilingualism in individuals with ASD. It was hypothesized that the professionals would advise parents to use a monolingual approach, thus reinforcing the language that is spoken the most in the community. This study found that 47.2% ($n$=17) of the professionals had a caseload of 15 or more bilingual patients or students, therefore showing our participants had experience with the bilingual population. A total of 50% ($n$=18) of the participants also reported to have or have had a caseload of 1-5 patients with an ASD diagnosis, followed by a 27.8% ($n$=10) of participants who have or have had a caseload of 15 or more patients with ASD diagnosis.

Therefore, it was suggested that participants have had experience with an individual with ASD from a bilingual household. When the professionals were asked about their perceptions, it was found that 33% (*n*=9) of the participants somewhat agreed to the statement: "a person with ASD benefits from a simplified linguistic input (one-language only), which facilitates language learning and use". However, when the participants rated the statement: "a monolingual approach is the best fit for a person with ASD from a bilingual household", it was found that 42.31% (*n*=11) of the participants strongly disagreed. Which shows an underlying tension in recommending a monolingual approach to a person with ASD from a bilingual household. Thus, for the statement: "a bilingual approach is the best fit for a person with ASD from a bilingual household", it was found that majority of participants reported to somewhat agree (*n*=9, 35%) or to strongly agree (*n*=9, 35%).

When participants were asked whether bilingualism can cause more delays, it was found that majority of the participants strongly disagreed (*n*=10, 38.5%) or somewhat disagreed (*n*=6, 23.1%) with this statement. There was still not a clear consensus on the perception of whether bilingualism could cause confusion for a child with ASD, although most of the participants strongly disagreed, *(n*= 9*,* 34.62%), there was an equal number of participants who somewhat disagreed (*n*=7, 27%) and neither agreed nor disagreed (*n*=7, 27%). This shows that there is still not a strong understanding regarding this perception, which echoes the findings that usual recommendations for bilingual families of children with ASD for a monolingual approach are due to avoid language confusion (Jegatheesan et al., 2011) and that the linguistic and cognitive effects of bilingualism in ASD are still poorly understood (Digard et al., 2020). However, rather than causing confusion, the use of more than one language can open opportunities for

communication and shared meaning (Soto & Yu, 2014). Additionally, there was support on perceptions that stated a child with ASD from a bilingual household can speak and understand both languages with participants either by somewhat agreeing or strongly agreeing with these perceptions. These findings were expected due to the literature saying there are no differences between bilingual children and their monolingual peers in terms of vocabulary sizes, expressive and receptive communication, and milestones in their language development (Petersen et al., 2012; Hambly & Fombonne, 2012; Valicenti-McDermott et al., 2012; Ohashi et al., 2012) and that research has found that children with ASD are completely capable of becoming bilingual (Park et al, 2014).

Also, it was found that majority of the professionals ($n$=16, 62%) have already recommended a bilingual approach for a person with ASD from a bilingual household and only a few professionals ($n$=3, 11.54%) have recommended a monolingual approach to person with ASD from a bilingual household. Compared to the literature in the United States, this study provided practitioners with the opportunity of reporting their recommendations to a child with ASD from a bilingual household. Howard et al. (2020) investigated educators' perspectives in both England and Wales, they found differences between practitioners' attitudes towards bilingualism. The practitioners who worked within a bilingual educational system (Welsh-schools) were more convinced by the benefits of dual language use and more willing to endorse bilingualism in autism as they considered it a customary experience. Consequently, this study found that practitioner's views were partly influenced by the linguistic profile of the school in which they worked. This could also be the case in the Rio Grande Valley, Texas in which 80.1% of its population are estimated Spanish speakers (American Community Survey, 2015; Dávila-Montes et al., 2019).

The second research question investigated the professionals' reasoning when recommending a monolingual vs. a bilingual approach for a person with ASD. It was hypothesized that the professionals' reasoning would be based on their own personal perspectives of ASD and bilingualism, due to lack of consistency of recommendations between practitioners and limited bilingual resources. However, the study found that majority of the participants recommended a bilingual approach or recommended an individualized approach due to past experiences or their professional background. Participants' recommendations from this Qualtrics survey supported the literature findings on language advice and how it should be provided on a case-by-case basis (Hampton et al., 2017). Bilingual approach should start with an accurate assessment of the child's communicative ability, followed by collaborative goal setting, and intervention considerations such as educating and training parents, family members, teachers, and peers in order to provide language facilitation strategies (Baker, 2013; Pickl, 2011; Seung et al., 2006; Soto & Yu, 2014; Wilder et al., 2004). Recommendations should be provided according to the child's language development, and reevaluations should provide information on the child's bilingual capacity according to the child's ongoing language development (Howard et al., 2020).

Similarly, practitioners from this study echoed the view from Howard et al. (2020), by mentioning that bilingual development could take longer for a child with ASD, but it was nonetheless possible. Additionally, the study found that professional expertise, evidence-based studies, carry-over, generalization, patient's progress in therapy and parental report are what influenced a professional's reasoning when making a decision about bilingualism and ASD.

The reasoning was found to be consistent with the bilingual recommendations provided to families and individuals with ASD. Therefore, it was concluded that professionals from the Rio Grande Valley, Texas are providing informed decisions according to evidence-based practices and their previous experiences with a patient/student with ASD from a bilingual household.

The third research question investigated the perceptions of parents of individuals with ASD regarding bilingualism. It was hypothesized that parents would utilize a monolingual approach as recommended by professionals, due to lack of bilingual support and resources. The push to use only one language with a child with ASD from bilingual households is related to the notion that becoming bilingual is too challenging for children with ASD, and might even cause additional language delays (Bird, 2011; Yu, 2009), therefore parents have reported a lack of satisfactory support for their bilingual families, and that primary language alternatives or resources are usually not available (Kay-Raining et al., 2012; Bird et al., 2012; Yu, 2013, Mueller et al., 2006). The results from the survey indicated that 54% ($n$=6) of the parents rated their interactions with their child as average when they spoke to their child in the English language. These questions were of importance due to findings from Kay-Raining et al. (2012) where parents of bilingual children with ASD described more natural, relaxed and intimate interactions with their children when using their native language, not English. However, this was not the case in this study due to 100% ($n$=11) of the parents feeling comfortable in speaking and teaching English to their child, and because the majority ($n$=9, 81.8%) reported being very fluent in the English language.

This study found that majority of the parents ($n$=4, 40%) reported to keep communication simple for their child since two languages seemed to be challenging. Additionally, there was not a clear consensus from parents regarding whether they believed that bilingualism could cause

confusion or delays. This indicates that parents are not being informed by professionals on the capacity of their child to become bilingual without delays or confusion. Most of the parents (*n*=5, 45%) somewhat disagreed on the perception that bilingualism is an additional burden to their child, while 36% (*n*=4) of the participants strongly disagreed that one language was the only option for their child to learn a language, therefore suggesting that parents want their child to be bilingual. Moreover, when parents reported their child's achievements in understanding both English and Spanish, it was found that 72.7% (*n*=8) of the parents somewhat agreed that their child was able to understand both languages. However, only 9% (*n*=1) of the parents reported that their child was able to speak both languages.

When the participants were asked whether professionals were supportive about speaking to their child with ASD in their native language, 63% of the participants reported to strongly agree in that professionals do support them (*n*=7). Compared to the literature, which says parents still report a lack of support from practitioners and services when it comes to raising a child with ASD in more than one language (Hampton et al., 2017, Kay-Raining Bird et al., 2012), this study's findings showed that parents are feeling supported by professionals when choosing a bilingual approach or to teach their child their native language. Furthermore, when the parents were asked if there were enough bilingual services and resources available, there was not a clear consensus on a decision, but the majority of participants reported to somewhat agree (*n*=3, 27%) or strongly agree (*n*=3, 27%).

The last research question addressed whether there were differences in the perceptions between parents and practitioners regarding bilingualism in individuals with ASD. It was hypothesized that there would be a difference in perceptions between parents and healthcare professionals regarding bilingualism and ASD. As described by Marinova-Todd et al. (2016),

there is a noticeable "disconnection" (p.58) between practitioners' beliefs about bilingualism for the ASD population and the reality of services available to them. Findings from this study suggested there were significant differences in three perceptions between professionals and parents. These perceptions in the survey for both professionals and parents included: "A person with ASD benefits from a simplified linguistic input (one-language only)", in which professionals were less likely to agree with this perception compared to parents. Furthermore, professionals and parents had a significant difference in the perception: "A child with ASD from a bilingual household is able to speak both languages", in this perception professionals were more likely to agree than parents. And finally, parents and professionals had a significant difference in the perception "there are enough bilingual service providers and resources", in which parents were more likely to agree than professionals.

These results indicate that there is in fact a divide in perceptions between professionals and parents regarding the capability of a child with ASD from a bilingual household to be able to speak both languages and become a successful bilingual. Professionals are becoming informed of the literature review and evidence-based practice, however there might not be enough education and awareness being provided to the family members of the child with ASD. This might also be the reason why parents were more likely to agree regarding providing a simplified linguistic output (one-language) for their child with ASD. Nevertheless, professionals disagreed with parents in that there are enough bilingual service providers or resources. Although the majority ($n$=23, 88%) of the professionals in this study were bilingual, ASHA reports that about 8.5% of its members identify as Hispanic and less than 5% of speech-language pathologists speak a language in addition to English (ASHA, 2012). Therefore, there could be more of a bilingual caseload demand than actual bilingual service providers for Speech Language Pathologists.

Although this might not be the case for all healthcare or education practitioners, and parents were not able to specify which bilingual provider they were rating in the Likert-scale. Moreover, aside from group differences in perceptions regarding bilingualism and ASD, it was found that there were significant effects on level of education and language. When participants were asked to rate perception 1: A person with ASD benefits from a simplified linguistic input (one-language only), which facilitates learning and use; it was found that participants with a bachelor's degree were more likely to agree compared to participants with a master's degree. Level of education also showed a significant effect on perceptions 4 and 5, which stated the ability of a child with ASD from a bilingual household being able to speak or understand both languages. Participants with a high school degree were more likely to agree with perception 4, and participants with a bachelor's degree were the least likely to agree that a child with ASD from a bilingual household is able to speak both languages. Likewise, for perception 5, participants with a high school degree were more likely to agree, while participants with a bachelor's degree were the least likely to agree that a child with ASD from a bilingual household is able to understand both languages.

Results of this study are significant as there is a limited consistency between professionals regarding recommendations of a monolingual or bilingual approach with people with ASD. Failure to adhere to a certain recommendation can have detrimental effects in the child with ASD's life and can result in further lack of social interaction. Additionally, it is imperative that practitioners support and bilingual students with ASD with more opportunities to hear and use both languages, as this helps to develop both social skills and language confidence, improving inclusion for bilingual children with ASD also involves facilitating opportunities for social interaction with peers (Symes & Humphrey, 2010; Anderson et al., 2016; Paradis &

GovinDarajan, 2018), and celebrating their strengths and differences. Developing dual-language abilities in children with ASD from bilingual families is essential for the facilitation of communication with parents, the formation of ethnic identities, and the increased opportunity for social interaction in and out of the home (Kremer-Sadlik, 2005; Wharton et al, 2000; Yu, 2009).

## Clinical Implications

The results of this study have clinical implications for practitioners in the Rio Grande Valley, TX. The difference in perspectives relating to ASD and bilingualism has the likeliness to result in unfavorable outcomes for a person with ASD and their family members. For instance, it can harm the development of multicultural identity, which is very important for children with ASD (Howard et al., 2019). Additionally, they might be limiting child's social encounters, social and emotional growth, and the quality of language models within their cultural communities (Wharton et al, 2000; Jegatheesan et al., 2010). Given the divide between some practitioners' belief that bilingualism is detrimental to a child with ASD's development and the growing body of literature that suggests it is not (Dai et al., 2018; Lim et al., 2018), raising awareness in schools and providing educators and practitioners with more training or continued education on autism and bilingualism is crucial (Iadarola et al., 2015; Evans et al., 2016). Children from minority language families should be encouraged to continue speaking their home language and should receive the support from practitioners in this decision (Beauchamp & MacLeod, 2017; Lim et al., 2018). Best practices to support language learning for people with outside of the family environment should be further investigated, since this will allow to provide better recommendations for families from bilingual or multilingual backgrounds (Digard et al., 2020).

A recommendation by Uljarevic et al. (2016) includes increased dialogue between families and practitioners, with particular attention given to parents' existing language practices, additionally Yu (2016) recommends listening and exploring the family members' beliefs about language use, as well as understanding and addressing the family's priorities. In conclusion, by understanding the perceptions and choices of parents, and the challenges that discourage them from choosing a multilingual approach, researchers and practitioners will be better placed to provide evidence-based recommendations (Howard et al., 2020).

## Limitations of the Present Study

A major limitation of the present study was the small sample size and the unbalanced sample sizes balance between the two groups being compared. A small sample size can affect results and is at risk for a variety of errors, and the size also impedes with the ability to utilize a variety of statistical analysis. Additionally, a limited number of parents participated in this study which interferes with the validity of the current findings regarding the participants' experiences with bilingualism and professionals in the Rio Grande Valley.

Furthermore, the design of the survey could have been a possible limitation of the study. Participants might have had difficulty in understanding the instructions or questions, and the survey's questions could have been asked to better validate the findings and reason for conducting the study. Each group was provided with a different set of questions, which makes this a limitation and weakness in the study. An additional limitation includes the support from outside organizations when recruiting parents, as this could produce response bias in the study.

## Implications for Future Research

Further research in this topic should include reduplication of the study with larger number of participants so results can be more conclusive, especially with more male parents and a varied level of education from participants. Moreover, the same set of questions should be utilized with both groups to compare perceptions not included in this study. In addition, a larger and more diverse sample size of professionals in a variety of healthcare disciplines would improve the validity and provide generalizations and understanding of the findings in the different work settings in the Rio Grande Valley, TX

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# APPENDIX A

# APPENDIX A

# IRB APPROVAL

The University of Texas Rio Grande Valley
*Institutional Review Board*

March 1st, 2021

Rosa Benavidez, Principal Investigator
College of Health Professions
Via Electronic Routing System

Dear Principal Investigator:

**RE: EXEMPT DETRMINATION FOR IRB-20-0286, *"Protocol Bilingual Autism"***

The study in reference has been determined 'Exempt' under the Basic HHS Policy for Protection of Human Research Subjects, 45 CFR 46.104(d). The determination is effective as of the date of this letter within the exempt category of:

*"(2) Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:*

*(i) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects;"*

Research that is determined to be 'Exempt' under the Basic HHS Policy for Protection of Human Research Subjects is not exempt from ensuring protection of human subjects. The Principal Investigator (PI) is responsible for the following through the conduct of the research study:

1. Assuring that all investigators and co-principal investigators are trained in the ethical principles, relevant federal regulations, and institutional policies governing human subjects' research.
2. Disclosing to the subjects that the activities involve research, and that participation is voluntary during the informed consent process.
3. Providing subjects with pertinent information (e.g., risks and benefits, contact information for investigators, and IRB/ORC) and ensuring that human subjects will voluntarily consent to participate in the research when appropriate (e.g., surveys, interviews).
4. Assuring the subjects will be selected equitably, so that the risks and benefits of the research are justly distributed.
5. Assuring that the privacy of subjects and confidentiality of the research data will be maintained appropriately to ensure minimal risk to subjects.

Exempt research is subject to the ethical principles articulated in The Belmont Report, found at the Office of Human Research Protections (OHRP) Website:
www.hhs.gov/ohrp/humansubjects/guidance/belmont.html

Unanticipated Problems: Any unanticipated problems or complaints must be reported to the IRB promptly. Further information concerning unanticipated problems can be found in the IRB procedures manual.

Continuing Review: research deemed 'Exempt' is not subject to annual review by the IRB.

Modifications: Any change to your protocol requires a Modification Request (Amendment) for review and approval prior to implementation. The IRB may review the 'Exempt' status at that time and request an application for approval as non-Exempt research.

Closure: Please notify the IRB when your study is complete through submission of a final report. Upon notification, we will close our files pertaining to your study.

If you have any questions, please contact the Human Subjects Protection Program/IRB by phone at (956) 665-2093 or via email at irb@utrgv.edu.

Sincerely,

Institutional Review Board
for the Protection of Human Subjects
in Research

orc/gc

APPENDIX B

# APPENDIX B

# LETTER OF SUPPORT

**TeamMario.org**
An Autism Awareness Organization

PO Box 2985
Edinburg, Texas 78540

956-648-735
fax 888-308-099

info@teammario.or
www.teammario.or

Tax ID# 46-566143

September 14, 2020
TEAM MARIO
PO BOX 2985
Edinburg, TX 78541

RE: Perspectives on Bilingualism in persons with Autism Spectrum Disorder in the Rio Grande Valley

Dear Rosa Benavidez,
I am writing regarding the research study titled, "*Perspectives on Bilingualism in persons with Autism Spectrum Disorder in the Rio Grande Valley*" to acknowledge and provide site permission for research that will be conducted with/at Team Mario. I understand that this data will be owned by UTRGV and will be used in professional presentations and publications.

More specifically, our facility will facilitate this research in the following ways:

| | |
|---|---|
| ☐ Allow project staff to be on-site to recruit participants. | ☐ Provide space for participants to complete the research activities on site. |
| ☐ Hand-out flyers about the study. | ☐ Obtaining consent from participants |
| ☐ Provide data from records or access to records for the collection of study data. | ☐ Conduct study assessments and/or collect study samples. |
| ☐ Implement study manipulation/intervention | ☒ Other: Disseminate survey to participants/Provide e-mail lists of survey participants. |
| ☒ I/we want to be recognized by name in publications or presentations<br><br>(If checking this box, please indicate the names of people or the organization as you would expect it to appear in publications<br><br>TEAM MARIO | |

I certify to have the authority to bind my organization and to grant such permission to conduct the proposed research at TEAM MARIO.

Sincerely,

Lisa Becerra-Walker
Program Director, TEAM MARIO

APPENDIX C

# APPENDIX C

## RECRUITMENT E-MAIL FOR PARENTS

The University of Texas Rio Grande Valley

To Whom It May Concern:

My name is Rosa Nelda Benavidez; I am a graduate student from the Department of Communication Sciences and Disorders at the University of Texas Rio Grande Valley (UTRGV), and I am under the supervision of Dr. Crutchfield. SLP.D., CCC-SLP. I would like to invite you to participate in my research study, which consists of investigating the Perspectives on Bilingualism in persons with Autism Spectrum Disorder in the Rio Grande Valley.

This research study has been reviewed and approved by the Institutional Board for the Protection of Human Subjects (IRB) at the University of Texas Rio Grande Valley.

In order to participate you must be 18 years or older. Participation in this research is completely voluntary.

As a participant, you will be asked to complete an online survey, which should take about 10 minutes of your time. We will not be collecting any personal identifying information.

If you would like to participate in this research study, please click on the survey link below. If you do not wish to participate, please disregard this e-mail.

Survey Link: https://utrgv.co1.qualtrics.com/jfe/form/SV_0pHbri9TIsCUlFj

Thank you very much for your time and consideration. If you have any questions please contact the following:

Ruth Crutchfield, SLP.D., CCC-SLP.
Ruth.crutchfield@utrgv.edu
(956)-665-5273

Rosa N. Benavidez, B.S.
Rosa.benavidez01@utrgv.edu
(956)-346-4737

# APPENDIX C

## RECRUITMENT E-MAIL FOR PARENTS (SPANISH)


A quien corresponda:

Mi nombre es Rosa Nelda Benavidez; Soy un estudiante de posgrado del Departamento de Ciencias y Trastornos de la Comunicación de la Universidad de Texas Rio Grande Valley (UTRGV). Me gustaría invitarlos a participar en mi estudio de investigación, que consiste en investigar las percepciones de los profesionales y padres del Valle del Rio Grande sobre individuos con trastornos del espectro autista respecto al bilingüismo.

Este estudio de investigación ha sido revisado y aprobado por la Junta Institucional para la Protección de Sujetos Humanos (IRB) de la Universidad de Texas Rio Grande Valley.

Para participar debes tener 18 años o más.

La participación en esta investigación es completamente voluntaria.
Como participante, se le pedirá que complete una encuesta en línea, que debería tomar unos 20 minutos de su tiempo. No recopilaremos ninguna información de identificación personal. Si desea participar en este estudio de investigación, haga clic en el enlace de la encuesta a continuación. Si no desea participar, ignore este correo electrónico.

Enlace de encuesta: https://utrgv.co1.qualtrics.com/jfe/form/SV_0pHbri9TIsCUlFj

Muchas gracias por su tiempo y consideración.

Si tiene alguna duda o pregunta, favor de comunicarse con las siguientes personas:

Ruth Crutchfield, SLP.D, CCC-SLP.
Ruth.crutchfield@utrgv.edu
(956)-665-5273

Rosa N. Benavidez, B.S.
Rosa.benavidez01@utrgv.edu
(956)-346-4737

APPENDIX D

# APPENDIX D

## RECRUITMENT EMAIL FOR PROFESSIONALS

The University of Texas Rio Grande Valley

To Whom It May Concern:

My name is Rosa Nelda Benavidez; I am a graduate student from the Department of Communication Sciences and Disorders at the University of Texas Rio Grande Valley (UTRGV), and I am under the supervision of Dr. Crutchfield. SLP.D., CCC-SLP. I would like to invite you to participate in my research study, which consists of investigating the Perspectives on Bilingualism in persons with Autism Spectrum Disorder in the Rio Grande Valley.

This research study has been reviewed and approved by the Institutional Board for the Protection of Human Subjects (IRB) at the University of Texas Rio Grande Valley.

In order to participate you must be 18 years or older. Participation in this research is completely voluntary.

As a participant, you will be asked to complete an online survey, which should take about 10 minutes of your time. We will not be collecting any personal identifying information.

If you would like to participate in this research study, please click on the survey link below. If you do not wish to participate, please disregard this e-mail.

Survey Link: https://utrgv.co1.qualtrics.com/jfe/form/SV_bkjmHHJUd2ef8Lb

Thank you very much for your time and consideration. If you have any questions please contact the following:

Ruth Crutchfield, SLP.D., CCC-SLP.
Ruth.crutchfield@utrgv.edu
(956)-665-5273

Rosa N. Benavidez, B.S.
Rosa.benavidez01@utrgv.edu
(956)-346-4737

APPENDIX E

# APPENDIX E

# PARTICIPANT SURVEY: PROFESSIONALS

**Perspectives on Bilingualism in Persons with Autism Spectrum Disorder in the Rio Grande Valley**

This survey is being conducted by Rosa Benavidez B.S., a graduate student in the Communication Sciences and Disorders department, at The University of Texas Rio Grande Valley (UTRGV) under the supervision of Dr. Ruth Crutchfield, SLP.D., CCC-SLP.
The purpose of this study is to investigate the perceptions of professionals regarding bilingualism in persons with autism spectrum disorder across the Rio Grande Valley. This survey should take about 10 minutes to complete. Participation in this research is completely voluntary and anonymous. If there are any questions, which you are uncomfortable with answering, feel free to skip that question and leave the answer blank. Also, please be aware that you are entitled to withdraw from the study and terminate your participation at any time without question or comment. You must be at least 18 years old to participate. If you are not 18 or older, please do not complete the survey. All survey responses received will be treated confidentially and stored on a secure server. However, given that the surveys can be completed from any computer (e.g., personal, work, school), there is no guarantee of the security of the computer on which you choose to enter your responses. As a participant in this study, please be aware that certain technologies exist that can be used to monitor or record data and/or websites that are visited. This research has been reviewed and approved by the UTRGV Institutional Review Board for Human Subjects Protection (IRB). If you have any questions about your rights as a participant, or if you feel that your rights as a participant were not adequately met by the researcher, please contact the IRB at (956) 665-3598 or irb@utrgv.edu.

**End of Block: Consent**

---

**Start of Block: Demographics**

1. What is your age?

_____

2. What is your race?

- ○ American Indian or Alaska Native
- ○ Asian
- ○ Black or African American
- ○ Native Hawaiian or Pacific Islander
- ○ White
- ○ Other

3. What is your sex?

- ○ Female
- ○ Male

4. What is your highest level of education?

- ○ High School graduate
- ○ Some college
- ○ Bachelor's degree
- ○ Master's degree
- ○ Doctoral or Professional Degree

5. What is your profession?

- ○ Board Certified Behavior Analyst
- ○ Medical Doctor
- ○ Occupational Therapist
- ○ Physical Therapist
- ○ Psychologist
- ○ Special Education Teacher
- ○ Speech-Language Pathologist
- ○ Teacher
- ○ Other (Please Specify) _____

6. What is your employment setting?

- ○ Clinic
- ○ Home Health
- ○ Hospital
- ○ Private Practice
- ○ School District
- ○ Other (please specify) _____

7. In which city do you provide services? (Check all that apply)

- ☐ Brownsville
- ☐ Edinburg
- ☐ Harlingen
- ☐ Hidalgo
- ☐ La Feria
- ☐ McAllen
- ☐ Mercedes
- ☐ Mission
- ☐ Pharr
- ☐ Rio Grande City
- ☐ San Benito
- ☐ Weslaco
- ☐ Other _____

8. What language(s) are spoken at work?

- [ ] American Sign Language
- [ ] English
- [ ] Spanish
- [ ] Other _____

9. How fluent are you in the English language?

- ○ Very fluent
- ○ Somewhat fluent
- ○ Not fluent

10. How fluent are you in the Spanish language?

- ○ Very fluent
- ○ Somewhat Fluent
- ○ Not fluent

11. What is your caseload inclusion of individuals with ASD?

- ○ 1-5 patients
- ○ 6-10 patients
- ○ 11-15 patients
- ○ 15 or more

12. In the past 2 years, how much of your caseload has been bilingual?

- ○ 1-5 patients
- ○ 6-10 patients
- ○ 11-15 patients
- ○ 15 or more

13. Please rate these to the best of your ability.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|---|---|---|---|---|---|
| 13.1 A person with ASD benefits from a "simplified" linguistic input (one language only), which facilitates language learning and use. | ○ | ○ | ○ | ○ | ○ |
| 13.2 A monolingual approach is the best fit for a person with ASD from a bilingual household. | ○ | ○ | ○ | ○ | ○ |
| 13.3 A bilingual approach is the best fit for a person with ASD from a bilingual household. | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| 13.4 Bilingualism can cause more delays for a person with ASD. | ○ | ○ | ○ | ○ | ○ |
| 13.5 Bilingualism can cause confusion for a child with ASD. | ○ | ○ | ○ | ○ | ○ |
| 13.6 A child with ASD from a bilingual household is able to speak both languages. | ○ | ○ | ○ | ○ | ○ |
| 13.7 A child with ASD from a bilingual household is able to understand both languages. | ○ | ○ | ○ | ○ | ○ |
| 13.8 There are enough bilingual service providers and resources. | ○ | ○ | ○ | ○ | ○ |

14. I have recommended a monolingual approach for a person with ASD from a bilingual household.

- ○ Yes
- ○ No
- ○ Never

15. I have recommended a bilingual approach for a person with ASD from a bilingual household.

- ○ Yes
- ○ No
- ○ Never

16. What is your professional opinion as to the language parents should speak to their child with ASD from a bilingual household?

_____

17. What influences your opinion when making these decisions?

_____

APPENDIX F

# APPENDIX F

# PARTICIPANT SURVEY: PARENTS

**Parent Survey**

**Perspectives on Bilingualism in Persons with Autism Spectrum Disorder in the Rio Grande Valley**

This survey is being conducted by Rosa Benavidez B.S., a graduate student in the Communication Sciences and Disorders department at The University of Texas Rio Grande Valley (UTRGV), under the supervision of Dr. Ruth Crutchfield, SLP.D., CCC-SLP.
The purpose of this study is to investigate the perceptions of parents regarding bilingualism in persons with autism spectrum disorder across the Rio Grande Valley. This survey should take about 10 minutes to complete. Participation in this research is completely voluntary and anonymous. You must be at least 18 years old to participate. If you are not 18 or older, please do not complete the survey. If there are any questions, which you are uncomfortable with answering, feel free to skip that question and leave the answer blank. Also, please be aware that you are entitled to withdraw from the study and terminate your participation at any time without question or comment. All survey responses received will be treated confidentially and stored on a secure server. However, given that the surveys can be completed from any computer (e.g., personal, work, school), there is no guarantee of the security of the computer on which you choose to enter your responses. As a participant in this study, please be aware that certain technologies exist that can be used to monitor or record data and/or websites that are visited.

This research has been reviewed and approved by the UTRGV Institutional Review Board for Human Subjects Protection (IRB). If you have any questions about your rights as a participant, or if you feel that your rights as a participant were not adequately met by the researcher, please contact the IRB at (956) 665-3598 or irb@utrgv.edu.

**Perspectivas sobre el bilingüismo de personas con trastorno del espectro autista en el Valle del Río Grande**

Esta encuesta está siendo realizada por Rosa Benavidez B.S., una estudiante de posgrado del departamento de Ciencias y Trastornos de Comunicación en la Universidad de Texas Rio Grande Valley (UTRGV), bajo la supervisión de la Dra. Crutchfield, SLP.D., M.S., CCC-SLP.

El propósito de este estudio es investigar las percepciones de los padres con respecto al bilingüismo en personas con trastorno del espectro autista en todo el Valle del Río Grande. Esta encuesta tomará unos 10 minutos en completarse. La participación en esta investigación es completamente voluntaria y anónima. Si hay alguna pregunta que no se sienta cómodo con responder, no dude en omitir esa pregunta y dejar la respuesta en blanco. Además, tenga en cuenta que tiene derecho a retirarse del estudio y finalizar su participación en cualquier momento sin preguntas ni comentarios. Los participantes deben tener al menos 18 años. Si no tiene 18

años o más, no complete la encuesta. Todas las respuestas de la encuesta serán tratadas de manera confidencial y almacenadas en un servidor seguro. Sin embargo, dado que las encuestas se pueden completar desde cualquier computadora (por ejemplo, personal, laboral, escolar), no hay garantía de la seguridad de la computadora en la que elige ingresar sus respuestas. Como participante en este estudio, tenga en cuenta que existen ciertas tecnologías que pueden usarse para monitorear o registrar datos y / o sitios web que se visitan.
Esta investigación ha sido revisada y aprobada por la Junta de Revisión Institucional para la Protección de Sujetos Humanos (IRB) de la Universidad de Texas Rio Grande Valley. Si tiene alguna pregunta sobre sus derechos como participante, o si cree que el investigador no cumplió adecuadamente sus derechos como participante, comuníquese con el IRB al (956) 665-3598 o irb@utrgv.edu.

**End of Block: Start**

**Start of Block: Parents' Demographics**

Please answer these questions to the best of your ability. You are not required to answer all the questions.

Por favor conteste estas preguntas lo mejor que pueda. No esta requerido a contestar todas las preguntas.

1. What is your age?

_____

1. ¿Cuál es su edad?

_____

2. What is your race?

- ○ American Indian or Alaska Native
- ○ Asian
- ○ Black or African American
- ○ Native Hawaiian or Pacific Islander
- ○ White
- ○ Other

2. ¿Cuál es su raza?

- ○ Indio Americano o Nativo de Alaska
- ○ Asiático
- ○ Negro o Afroamericano
- ○ Nativo Hawaiano o Isleño del Pacifico
- ○ Blanco
- ○ Otro

3. What is your sex?

- ○ Female
- ○

3. ¿Cuál es su sexo?

- ○ Femenino
- ○ Masculino

4. What is your highest level of education?

- ○ Middle School
- ○ High School graduate
- ○ Some college
- ○ Bachelor's degree
- ○ Master's degree
- ○ Doctoral or Professional Degree

4. ¿Cuál es su nivel de educación más alto?

- ○ Graduado de Secundaria
- ○ Graduado de Preparatoria
- ○ Algo de Universidad
- ○ Graduado de la Universidad ó Licenciatura
- ○ Maestría
- ○ Título de Doctorado ó Profesional

5. Where do you live?

- ○ Brownsville
- ○ Edinburg
- ○ Harlingen
- ○ Hidalgo
- ○ La Feria
- ○ McAllen
- ○ Mercedes
- ○ Mission
- ○ Pharr
- ○ Rio Grande City
- ○ San Benito
- ○ Weslaco
- ○ Other _____

5. ¿En qué ciudad vive?

- ○ Brownsville
- ○ Edinburg
- ○ Harlingen
- ○ Hidalgo
- ○ La Feria
- ○ McAllen
- ○ Mercedes
- ○ Mission
- ○ Pharr
- ○ Rio Grande City
- ○ San Benito
- ○ Weslaco
- ○ Otro _____

6. What language(s) do you speak at home?

- ○ American Sign Language
- ○ English
- ○ Spanish
- ○ Both English and Spanish

6. ¿Qué idioma utiliza para hablar o comunicarse con su hijo(a) en su casa?

- ○ Lengua de señas
- ○ Inglés
- ○ Español
- ○ Inglés y Español

7. At what level of autism was your child diagnosed?

- ○ Level 1 (Requiring support)
- ○ Level 2 (Requiring substantial support)
- ○ Level 3 (Requiring very substantial support)
- ○ I don't know. I have never been informed.

7. ¿Cuál es el nivel de autismo del diágnostico de su hijo(a)?

- ○ Nivel 1 (Requiere apoyo)
- ○ Nivel 2 (Requiere un apoyo sustancial)
- ○ Nivel 3 (Requiere un apoyo muy sustancial)
- ○ No sé. No me han informado.

8. What is your child's method of communication?

- Augmentative and Assistive Communication Device (Low-Tech, High-Tech)
- American Sign Language (ASL)
- Verbal
- All of the Above

8. ¿Cuál es el método de comunicación de su hijo(a)?

- No verbal- Comunicación con fotos y gestos ó un modo de tecnología
- Lengua de señas
- Verbal
- Todas las anteriores

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9. How fluent are you in the English language?

- Very fluent
- Somewhat fluent
- Not fluent

9. ¿Qué tanto domina usted el Inglés?

- Mucho
- Poco
- Nada

10. How fluent are you in the Spanish language?

- Very fluent
- Somewhat fluent
- Not fluent

10. ¿Qué tanto domina usted el Español?

- ○ Mucho
- ○ Poco
- ○ Nada

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X→

11. Do you feel comfortable speaking and teaching English to your child?

- ○ Yes
- ○ Maybe
- ○ No

11. ¿Usted se siente cómodo en hablarle y enseñarle Inglés a su hijo(a)?

- ○ Si
- ○ Tal vez
- ○ No

12. How would you rate your interactions with your child when you speak the English language at home?

- ○ Excellent
- ○ Average
- ○ Poor
- ○ Not applicable

12. ¿Cómo calificaría sus interacciones con su hijo(a) cuando utiliza el Inglés para hablar en casa?

- ○ Excelente
- ○ Bien
- ○ No muy bien
- ○ No aplica

Please rate these from 1-5 to the best of your ability.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|---|---|---|---|---|---|
| 13.1 I keep communication simple for my child since two languages seem to be challenging. | ○ | ○ | ○ | ○ | ○ |
| 13.2 Bilingualism (speaking two languages) will cause my child to be more confused. | ○ | ○ | ○ | ○ | ○ |
| 13.3 Bilingualism will cause more delays in my child's language | ○ | ○ | ○ | ○ | ○ |
| 13.4. Bilingualism is an additional burden for my child. | ○ | ○ | ○ | ○ | ○ |
| 13.5 One language is the only option for my child to actually learn a language. | ○ | ○ | ○ | ○ | ○ |
| 13.6 My child understands both English and Spanish. | ○ | ○ | ○ | ○ | ○ |
| 13.7 My child speaks both English and Spanish. | ○ | ○ | ○ | ○ | ○ |
| 13.8 Professionals are supportive about speaking to my child in his/her native language | ○ | ○ | ○ | ○ | ○ |
| 13.9 There are enough bilingual services and resources available. | ○ | ○ | ○ | ○ | ○ |

13. Por favor califique estas declaraciones del 1-5 lo mejor que pueda.

| | Totalmente en desacuerdo (1) | Parcialmente en desacuerdo (2) | Ni en acuerdo ni en desacuerdo (3) | Parcialmente de acuerdo (4) | Totalmente de acuerdo (5) |
|---|---|---|---|---|---|
| 13.1 Mantengo las cosas simples ya que dos idiomas son un desafío para mi hijo(a). | ○ | ○ | ○ | ○ | ○ |
| 13.2 El bilingüismo (hablar dos idiomas) confunde más a mi hijo(a). | ○ | ○ | ○ | ○ | ○ |
| 13.3 El bilingüismo causa más retrasos en el lenguaje de mi hijo(a). | ○ | ○ | ○ | ○ | ○ |
| 13.4 Ser bilingüe es una carga adicional para mi hijo(a). | ○ | ○ | ○ | ○ | ○ |
| 13.5 Un idioma es la única opción para que mi hijo realmente aprenda un idioma. | ○ | ○ | ○ | ○ | ○ |
| 13.6 Mi hijo(a) entiende ambos | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| idiomas (Inglés y Español). | | | | | |
| 13.7 Mi hijo(a) habla ambos idiomas (Inglés y Español) . | ○ | ○ | ○ | ○ | ○ |
| 13.8 Los profesionales apoyan que le hable a mi hijo(a) en mi idioma natal. | ○ | ○ | ○ | ○ | ○ |
| 13.9 Hay suficientes servicios y recursos bilingües disponibles. | ○ | ○ | ○ | ○ | ○ |

14. Please continue to rate and answer the questions to the best of your ability.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|---|---|---|---|---|---|
| 14.1 Professionals have advised me to use only one language at home. | ○ | ○ | ○ | ○ | ○ |

14. Continúe clasificando y respondiendo las preguntas lo mejor que pueda.

| | Totalmente en desacuerdo (1) | Parcialmente en desacuerdo (2) | Ni en acuerdo ni en desacuerdo (3) | Parcialmente de acuerdo (4) | Totalmente de acuerdo (1) |
|---|---|---|---|---|---|
| 14. Los profesionales me aconsejan que use solo un idioma en casa. | ○ | ○ | ○ | ○ | ○ |

15. If you have been advised to use a one language approach, which professional(s) advised this? [Check all that apply]

- ☐ Board Certified Behavior Analyst
- ☐ Medical Doctor
- ☐ Occupational Therapist
- ☐ Physical Therapist
- ☐ Psychologist
- ☐ Special Education Teacher
- ☐ Speech-Language Pathologist
- ☐ Teacher
- ☐ Other (Please specify)

_____

15. Si le aconsejaron utilizar un enfoque en un solo idioma, ¿cuáles profesionales le recomendaron esto? [Marque todas las que apliquen]

- ☐ Analista de Conducta Certificado
- ☐ Doctor médico
- ☐ Terapeuta ocupacional
- ☐ Fisioterapeuta
- ☐ Psicólogo
- ☐ Maestra de Educación Especial
- ☐ Terapeuta del habla y lenguaje
- ☐ Maestra
- ☐ Otro (Por favor especifique)

_____

16. Please continue to rate and answer the questions to the best of your ability.

| | Strongly disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|---|---|---|---|---|---|
| 16.1 Professionals have advised me to use <u>both</u> languages at home. | ○ | ○ | ○ | ○ | ○ |

16. Continúe clasificando y respondiendo las preguntas lo mejor que pueda.

| | Totalmente en desacuerdo (1) | Parcialmente en desacuerdo (2) | Ni en acuerdo ni en desacuerdo (3) | Parcialmente de acuerdo (4) | Totalmente de acuerdo (5) |
|---|---|---|---|---|---|
| 16.1 Los profesionales me han aconsejado que use <u>ambos</u> idiomas en el hogar. | ○ | ○ | ○ | ○ | ○ |

16. If you have been advised to use a <u>two-language approach,</u> which professional(s) advised this? [Check all that apply]

- ☐ Board Certified Behavior Analyst
- ☐ Medical Doctor
- ☐ Occupational Therapist
- ☐ Physical Therapist
- ☐ Psychologist
- ☐ Special Education Teacher
- ☐ Speech-Language Pathologist
- ☐ Teacher
- ☐ Other (Please specify) _____

16. Si le aconsejaron utilizar dos idiomas, ¿cuáles profesionales le recomendaron esto? [Marque todos los que apliquen]

- [ ] Analista de Conducta Certificado
- [ ] Doctor médico
- [ ] Terapeuta Ocupacional
- [ ] Fisioterapeuta
- [ ] Psicólogo
- [ ] Maestra Educación Especial
- [ ] Terapeuta del habla y lenguaje
- [ ] Maestra
- [ ] Otro (Por favor especifique)

_____

**End of Block: Perspectives regarding Professionals' support**

APPENDIX G

APPENDIX G

FIGURES

**Figure 1**

*Professionals' perceptions Likert-scale*

| Likert-Scale | Strongly disagree | Somewhat disagree | Neither Agree nor Disagree | Somewhat agree | Strongly agree |
|---|---|---|---|---|---|
| 1. A person with ASD benefits from a simplified linguistic input (one-language only) which facilitates language learning and use. | 5 (18.5%) | 5 (18.5%) | 6 (22.2%) | 9 (33.3%) | 2 (7.4%) |
| 2. A monolingual approach is the best fit for a person with ASD from a bilingual household. | 11 (42.3%) | 4 (15.4%) | 3 (11.5%) | 5 (19.23%) | 3 (11.54%) |
| 3. A bilingual approach is the best fit for a person with ASD from a bilingual household | 0 (0%) | 1 (3.9%) | 7 (26.9%) | 9 (34.6%) | 9 (34.6%) |
| 4. Bilingualism can cause more delays for a person with ASD | 10 (38.5%) | 6 (23.1%) | 8 (30.7%) | 2 (7.7%) | 0 (0%) |
| 5. Bilingualism can cause confusion for a child with ASD. | 9 (34.6%) | 7 (26.9%) | 7 (26.9%) | 3 (11.5%) | 0 (0%) |
| 6. A child with ASD from a bilingual household is able to speak both languages. | 1 (3.9%) | 2 (7.7%) | 6 (23.1%) | 11 (42.3%) | 6 (23.1%) |

| | | | | | |
|---|---|---|---|---|---|
| 7. A child with ASD from a bilingual household is able to understand both languages. | 0 (0%) | 1 (3.9%) | 2 (7.7%) | 10 (38.5%) | 13 (50%) |
| 8. There are enough bilingual service providers and resources. | 11 (40.7%) | 9 (33.3%) | 2 (7.41%) | 3 (11.1%) | 2 (7.41%) |

**Figure 2**

*Professionals' perceptions*

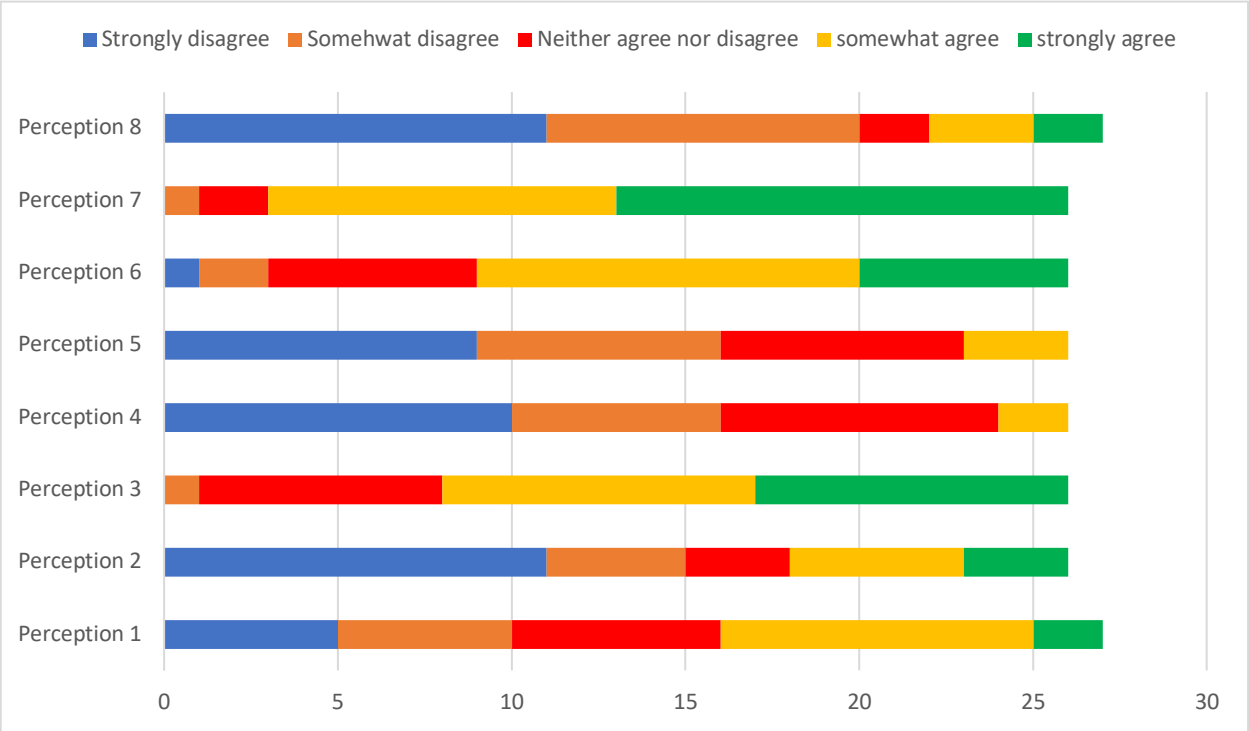


**Figure 3**

*Professionals' recommendations (Monolingualism/Bilingualism)*

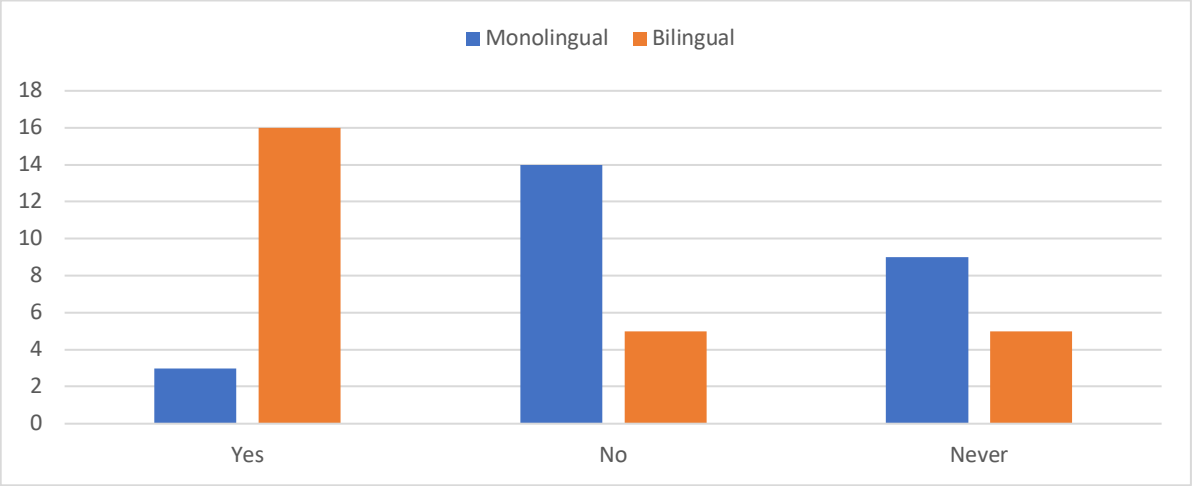



**Figure 4**

*Parents' perceptions Likert Scale*

| Likert-Scale | Strongly disagree | Somewhat disagree | Neither Agree nor Disagree | Somewhat agree | Strongly agree |
|---|---|---|---|---|---|
| 1. I keep communication simple for my child since two languages seem to be challenging. | 1 (10%) | 2 (20%) | 0 (0%) | 3 (30%) | 4 (40%) |
| 2. Bilingualism (speaking two languages) will cause my child to be more confused. | 4 (36.4%) | 2 (18.2%) | 2 (18.2%) | 3 (27.3%) | 0 (0%) |
| 3. Bilingualism will cause more delays in my child's language. | 3 (27.3%) | 1 (9.1%) | 3 (27.3%) | 3 (27.3%) | 1 (9.1%) |

| | | | | | |
|---|---|---|---|---|---|
| 4. Bilingualism is an additional burden for my child. | 3 (27.3%) | 5 (45.5%) | 2 (18.2%) | 0 (0%) | 1 (9.1%) |
| 5. One language is the only option for my child to actually learn a language. | 4 (36.4%) | 4 (36.4%) | 2 (18.2%) | 1 (9.1%) | 0 (0%) |
| 6. My child understands both English and Spanish. | 0 (0%) | 1 (9.1%) | 1 (9.1%) | 8 (72.7%) | 1 (9.1%) |
| 7. My child speaks both English and Spanish. | 5 (45.5%) | 4 (36.4%) | 0 (0%) | 1 (9.1%) | 1 (9.1%) |
| 8. Professionals are supportive about speaking to my child in his/her native language. | 1 (9.1%) | 0 (0%) | 1 (9.1%) | 2 (18.2%) | 7 (63.6%) |
| 9. There are enough bilingual services and resources available. | 2 (18.2%) | 1 (9.1%) | 2 (18.2%) | 3 (27.3%) | 3 (27.3%) |
| 10. Professionals have advised me to use only one language at home. | 5 (55.6%) | 0 (0%) | 3 (33.3%) | 0 (0%) | 1 (11.11%) |
| 11. Professionals have advised me to use both languages at home. | 2 (20%) | 0 (0%) | 4 (40%) | 1 (10%) | 3 (30%) |

**Figure 5**

*Parents' perceptions*

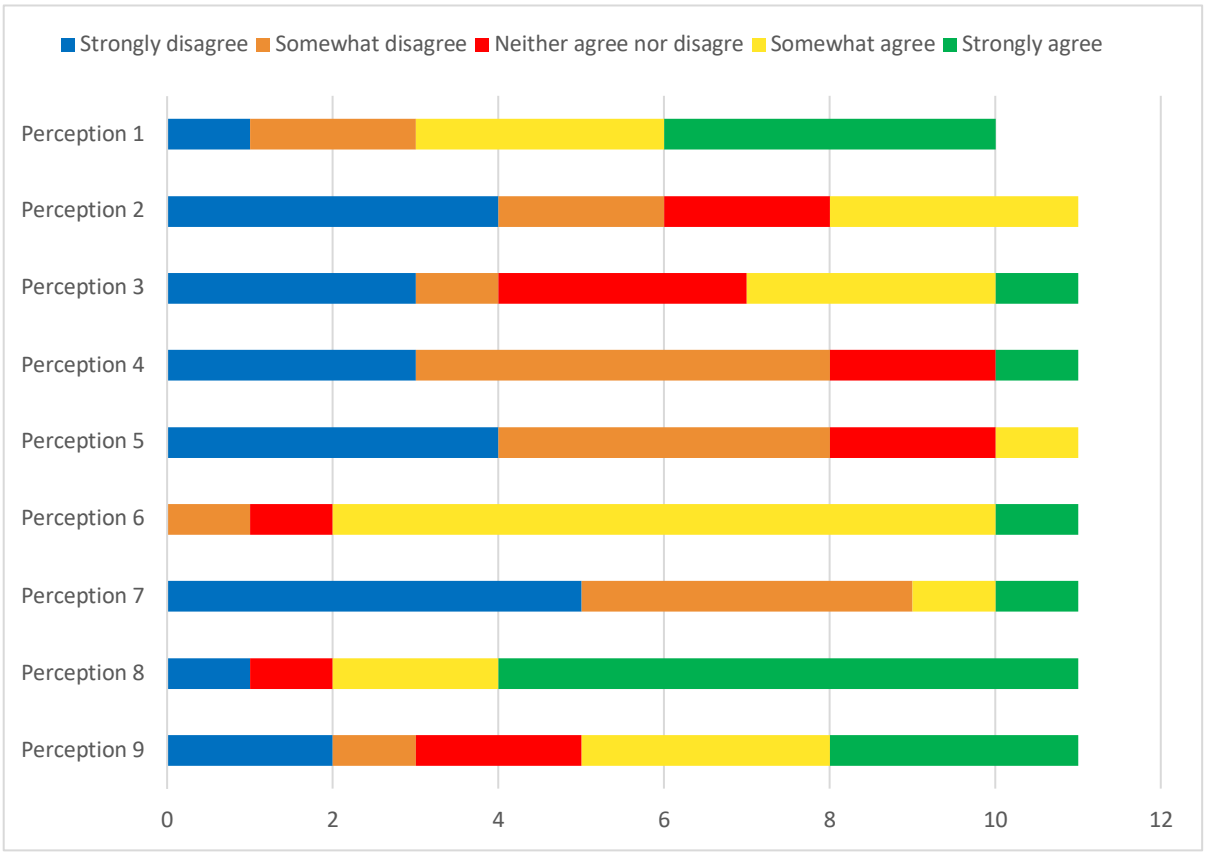
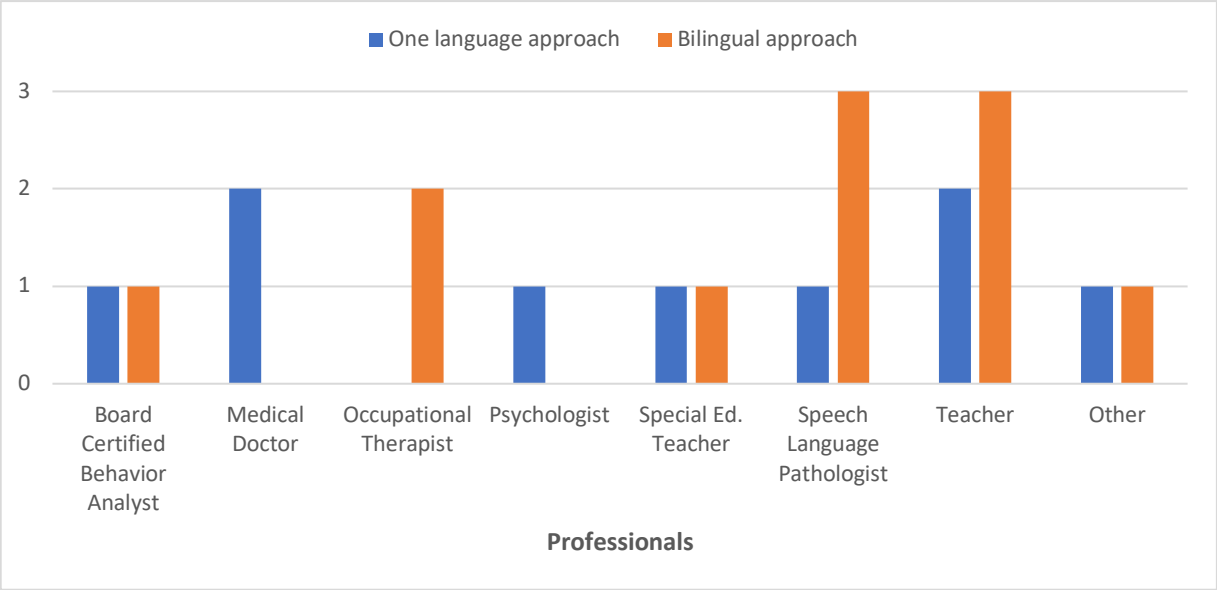


**Figure 6**

*Professionals recommending a one-language vs. bilingual approach, according to parents.*



APPENDIX H

# APPENDIX H

## SPSS OUTPUT FOR KNOWLEDGE RESULTS

```
ONEWAY Pers1 Pers2 Pers3 Pers4 Pers5 Pers6 BY Parent_Professional
 /STATISTICS DESCRIPTIVES HOMOGENEITY
 /MISSING ANALYSIS
 /CRITERIA=CILEVEL(0.95).
```

| | | | | | | 95% Confidence Interval for Mean | |
|---|---|---|---|---|---|---|---|
| | | N | Mean | Std. Deviation | Std. Error | Lower Bound | Upper Bound |
| Pers1 | 1.00 | 26 | 2.9231 | 1.29377 | .25373 | 2.4005 | 3.4456 |
| | 2.00 | 11 | 3.9091 | 1.57826 | .47586 | 2.8488 | 4.9694 |
| | Total | 37 | 3.2162 | 1.43634 | .23613 | 2.7373 | 3.6951 |
| Pers2 | 1.00 | 26 | 2.0769 | 1.01678 | .19941 | 1.6662 | 2.4876 |
| | 2.00 | 11 | 2.8182 | 1.40130 | .42251 | 1.8768 | 3.7596 |
| | Total | 37 | 2.2973 | 1.17532 | .19322 | 1.9054 | 2.6892 |
| Pers3 | 1.00 | 26 | 2.1538 | 1.04661 | .20526 | 1.7311 | 2.5766 |
| | 2.00 | 11 | 2.3636 | 1.28629 | .38783 | 1.4995 | 3.2278 |
| | Total | 37 | 2.2162 | 1.10893 | .18231 | 1.8465 | 2.5860 |
| Pers4 | 1.00 | 26 | 3.7308 | 1.04145 | .20424 | 3.3101 | 4.1514 |
| | 2.00 | 11 | 2.0000 | 1.34164 | .40452 | 1.0987 | 2.9013 |
| | Total | 37 | 3.2162 | 1.37710 | .22639 | 2.7571 | 3.6754 |
| Pers5 | 1.00 | 26 | 4.3462 | .79711 | .15633 | 4.0242 | 4.6681 |
| | 2.00 | 11 | 3.8182 | .75076 | .22636 | 3.3138 | 4.3225 |
| | Total | 37 | 4.1892 | .81096 | .13332 | 3.9188 | 4.4596 |
| Pers6 | 1.00 | 26 | 2.0000 | 1.16619 | .22871 | 1.5290 | 2.4710 |
| | 2.00 | 11 | 3.3636 | 1.50151 | .45272 | 2.3549 | 4.3724 |
| | Total | 37 | 2.4054 | 1.40356 | .23074 | 1.9374 | 2.8734 |

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Pers1 | Between Groups | 7.515 | 1 | 7.515 | 3.940 | .055 |
| | Within Groups | 66.755 | 35 | 1.907 | | |
| | Total | 74.270 | 36 | | | |
| Pers2 | Between Groups | 4.247 | 1 | 4.247 | 3.268 | .079 |
| | Within Groups | 45.483 | 35 | 1.300 | | |
| | Total | 49.730 | 36 | | | |
| Pers3 | Between Groups | .340 | 1 | .340 | .271 | .606 |
| | Within Groups | 43.930 | 35 | 1.255 | | |
| | Total | 44.270 | 36 | | | |
| Pers4 | Between Groups | 23.155 | 1 | 23.155 | 17.963 | .000 |
| | Within Groups | 45.115 | 35 | 1.289 | | |
| | Total | 68.270 | 36 | | | |
| Pers5 | Between Groups | 2.155 | 1 | 2.155 | 3.504 | .070 |
| | Within Groups | 21.521 | 35 | .615 | | |
| | Total | 23.676 | 36 | | | |
| Pers6 | Between Groups | 14.373 | 1 | 14.373 | 8.897 | .005 |
| | Within Groups | 56.545 | 35 | 1.616 | | |
| | Total | 70.919 | 36 | | | |

```
ONEWAY Pers1 Pers2 Pers3 Pers4 Pers5 Pers6 BY Age
  /STATISTICS DESCRIPTIVES HOMOGENEITY
  /MISSING ANALYSIS
  /CRITERIA=CILEVEL(0.95).
```

| | | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Pers1 | 1.00 | 12 | 3.1667 | 1.58592 | .45782 | 2.1590 | 4.1743 |
| | 2.00 | 17 | 2.9412 | 1.47778 | .35841 | 2.1814 | 3.7010 |
| | 3.00 | 6 | 4.3333 | .51640 | .21082 | 3.7914 | 4.8753 |
| | 4.00 | 2 | 2.5000 | .70711 | .50000 | -3.8531 | 8.8531 |
| | Total | 37 | 3.2162 | 1.43634 | .23613 | 2.7373 | 3.6951 |
| Pers2 | 1.00 | 12 | 2.0000 | 1.04447 | .30151 | 1.3364 | 2.6636 |
| | 2.00 | 17 | 2.2941 | 1.31171 | .31814 | 1.6197 | 2.9685 |
| | 3.00 | 6 | 3.0000 | .89443 | .36515 | 2.0614 | 3.9386 |
| | 4.00 | 2 | 2.0000 | 1.41421 | 1.00000 | -10.7062 | 14.7062 |
| | Total | 37 | 2.2973 | 1.17532 | .19322 | 1.9054 | 2.6892 |
| Pers3 | 1.00 | 12 | 1.9167 | .99620 | .28758 | 1.2837 | 2.5496 |
| | 2.00 | 17 | 2.2941 | 1.26317 | .30636 | 1.6447 | 2.9436 |
| | 3.00 | 6 | 2.6667 | .81650 | .33333 | 1.8098 | 3.5235 |
| | 4.00 | 2 | 2.0000 | 1.41421 | 1.00000 | -10.7062 | 14.7062 |
| | Total | 37 | 2.2162 | 1.10893 | .18231 | 1.8465 | 2.5860 |
| Pers4 | 1.00 | 12 | 3.7500 | 1.13818 | .32856 | 3.0268 | 4.4732 |
| | 2.00 | 17 | 3.1176 | 1.57648 | .38235 | 2.3071 | 3.9282 |
| | 3.00 | 6 | 2.3333 | 1.03280 | .42164 | 1.2495 | 3.4172 |
| | 4.00 | 2 | 3.5000 | .70711 | .50000 | -2.8531 | 9.8531 |
| | Total | 37 | 3.2162 | 1.37710 | .22639 | 2.7571 | 3.6754 |
| Pers5 | 1.00 | 12 | 4.2500 | .96531 | .27866 | 3.6367 | 4.8633 |
| | 2.00 | 17 | 4.2353 | .75245 | .18250 | 3.8484 | 4.6222 |
| | 3.00 | 6 | 3.8333 | .75277 | .30732 | 3.0433 | 4.6233 |
| | 4.00 | 2 | 4.5000 | .70711 | .50000 | -1.8531 | 10.8531 |
| | Total | 37 | 4.1892 | .81096 | .13332 | 3.9188 | 4.4596 |
| Pers6 | 1.00 | 12 | 1.8333 | 1.19342 | .34451 | 1.0751 | 2.5916 |
| | 2.00 | 17 | 2.9412 | 1.56007 | .37837 | 2.1391 | 3.7433 |
| | 3.00 | 6 | 2.3333 | 1.03280 | .42164 | 1.2495 | 3.4172 |
| | 4.00 | 2 | 1.5000 | .70711 | .50000 | -4.8531 | 7.8531 |
| | Total | 37 | 2.4054 | 1.40356 | .23074 | 1.9374 | 2.8734 |

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Pers1 | Between Groups | 9.829 | 3 | 3.276 | 1.678 | .191 |
| | Within Groups | 64.441 | 33 | 1.953 | | |
| | Total | 74.270 | 36 | | | |
| Pers2 | Between Groups | 4.200 | 3 | 1.400 | 1.015 | .399 |
| | Within Groups | 45.529 | 33 | 1.380 | | |
| | Total | 49.730 | 36 | | | |
| Pers3 | Between Groups | 2.491 | 3 | .830 | .656 | .585 |
| | Within Groups | 41.779 | 33 | 1.266 | | |
| | Total | 44.270 | 36 | | | |
| Pers4 | Between Groups | 8.422 | 3 | 2.807 | 1.548 | .221 |
| | Within Groups | 59.848 | 33 | 1.814 | | |
| | Total | 68.270 | 36 | | | |
| Pers5 | Between Groups | 1.034 | 3 | .345 | .502 | .683 |
| | Within Groups | 22.642 | 33 | .686 | | |
| | Total | 23.676 | 36 | | | |
| Pers6 | Between Groups | 10.478 | 3 | 3.493 | 1.907 | .148 |
| | Within Groups | 60.441 | 33 | 1.832 | | |
| | Total | 70.919 | 36 | | | |

```
ONEWAY Pers1 Pers2 Pers3 Pers4 Pers5 Pers6 BY Gender
 /STATISTICS DESCRIPTIVES HOMOGENEITY
 /MISSING ANALYSIS
 /CRITERIA=CILEVEL(0.95).
```

| | | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Pers1 | 1.00 | 32 | 3.1875 | 1.40132 | .24772 | 2.6823 | 3.6927 |
| | 2.00 | 4 | 3.0000 | 1.82574 | .91287 | .0948 | 5.9052 |
| | 3.00 | 1 | 5.0000 | . | . | . | . |
| | Total | 37 | 3.2162 | 1.43634 | .23613 | 2.7373 | 3.6951 |
| Pers2 | 1.00 | 32 | 2.2500 | 1.19137 | .21061 | 1.8205 | 2.6795 |
| | 2.00 | 4 | 2.5000 | 1.29099 | .64550 | .4457 | 4.5543 |
| | 3.00 | 1 | 3.0000 | . | . | . | . |
| | Total | 37 | 2.2973 | 1.17532 | .19322 | 1.9054 | 2.6892 |
| Pers3 | 1.00 | 32 | 2.1250 | 1.07012 | .18917 | 1.7392 | 2.5108 |
| | 2.00 | 4 | 2.7500 | 1.50000 | .75000 | .3632 | 5.1368 |
| | 3.00 | 1 | 3.0000 | . | . | . | . |
| | Total | 37 | 2.2162 | 1.10893 | .18231 | 1.8465 | 2.5860 |
| Pers4 | 1.00 | 32 | 3.2188 | 1.33765 | .23647 | 2.7365 | 3.7010 |
| | 2.00 | 4 | 3.2500 | 2.06155 | 1.03078 | -.0304 | 6.5304 |
| | 3.00 | 1 | 3.0000 | . | . | . | . |
| | Total | 37 | 3.2162 | 1.37710 | .22639 | 2.7571 | 3.6754 |
| Pers5 | 1.00 | 32 | 4.2500 | .71842 | .12700 | 3.9910 | 4.5090 |
| | 2.00 | 4 | 4.0000 | 1.41421 | .70711 | 1.7497 | 6.2503 |
| | 3.00 | 1 | 3.0000 | . | . | . | . |
| | Total | 37 | 4.1892 | .81096 | .13332 | 3.9188 | 4.4596 |
| Pers6 | 1.00 | 32 | 2.4063 | 1.45601 | .25739 | 1.8813 | 2.9312 |
| | 2.00 | 4 | 2.2500 | 1.25831 | .62915 | .2478 | 4.2522 |
| | 3.00 | 1 | 3.0000 | . | . | . | . |
| | Total | 37 | 2.4054 | 1.40356 | .23074 | 1.9374 | 2.8734 |

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Pers1 | Between Groups | 3.395 | 2 | 1.698 | .814 | .451 |
| | Within Groups | 70.875 | 34 | 2.085 | | |
| | Total | 74.270 | 36 | | | |
| Pers2 | Between Groups | .730 | 2 | .365 | .253 | .778 |
| | Within Groups | 49.000 | 34 | 1.441 | | |
| | Total | 49.730 | 36 | | | |
| Pers3 | Between Groups | 2.020 | 2 | 1.010 | .813 | .452 |
| | Within Groups | 42.250 | 34 | 1.243 | | |
| | Total | 44.270 | 36 | | | |
| Pers4 | Between Groups | .052 | 2 | .026 | .013 | .987 |
| | Within Groups | 68.219 | 34 | 2.006 | | |
| | Total | 68.270 | 36 | | | |
| Pers5 | Between Groups | 1.676 | 2 | .838 | 1.295 | .287 |
| | Within Groups | 22.000 | 34 | .647 | | |
| | Total | 23.676 | 36 | | | |
| Pers6 | Between Groups | .450 | 2 | .225 | .109 | .897 |
| | Within Groups | 70.469 | 34 | 2.073 | | |
| | Total | 70.919 | 36 | | | |

```
ONEWAY Pers1 Pers2 Pers3 Pers4 Pers5 Pers6 BY Profession
  /STATISTICS DESCRIPTIVES HOMOGENEITY
  /MISSING ANALYSIS
  /CRITERIA=CILEVEL(0.95).
```

| | | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Pers1 | 2.00 | 2 | 3.0000 | 1.41421 | 1.00000 | -9.7062 | 15.7062 |
| | 3.00 | 3 | 3.3333 | .57735 | .33333 | 1.8991 | 4.7676 |
| | 6.00 | 1 | 3.0000 | . | . | . | . |
| | 7.00 | 14 | 2.7857 | 1.52812 | .40841 | 1.9034 | 3.6680 |
| | 8.00 | 4 | 3.2500 | .95743 | .47871 | 1.7265 | 4.7735 |
| | 9.00 | 2 | 2.5000 | 2.12132 | 1.50000 | -16.5593 | 21.5593 |
| | Total | 26 | 2.9231 | 1.29377 | .25373 | 2.4005 | 3.4456 |
| Pers2 | 2.00 | 2 | 2.5000 | .70711 | .50000 | -3.8531 | 8.8531 |
| | 3.00 | 3 | 3.3333 | .57735 | .33333 | 1.8991 | 4.7676 |
| | 6.00 | 1 | 2.0000 | . | . | . | . |
| | 7.00 | 14 | 1.7857 | 1.05090 | .28087 | 1.1789 | 2.3925 |
| | 8.00 | 4 | 2.0000 | .81650 | .40825 | .7008 | 3.2992 |
| | 9.00 | 2 | 2.0000 | 1.41421 | 1.00000 | -10.7062 | 14.7062 |
| | Total | 26 | 2.0769 | 1.01678 | .19941 | 1.6662 | 2.4876 |
| Pers3 | 2.00 | 2 | 3.0000 | 1.41421 | 1.00000 | -9.7062 | 15.7062 |
| | 3.00 | 3 | 3.0000 | .00000 | .00000 | 3.0000 | 3.0000 |
| | 6.00 | 1 | 2.0000 | . | . | . | . |
| | 7.00 | 14 | 1.7857 | 1.12171 | .29979 | 1.1381 | 2.4334 |
| | 8.00 | 4 | 2.5000 | .57735 | .28868 | 1.5813 | 3.4187 |
| | 9.00 | 2 | 2.0000 | 1.41421 | 1.00000 | -10.7062 | 14.7062 |
| | Total | 26 | 2.1538 | 1.04661 | .20526 | 1.7311 | 2.5766 |
| Pers4 | 2.00 | 2 | 3.5000 | 2.12132 | 1.50000 | -15.5593 | 22.5593 |
| | 3.00 | 3 | 3.6667 | .57735 | .33333 | 2.2324 | 5.1009 |
| | 6.00 | 1 | 4.0000 | . | . | . | . |
| | 7.00 | 14 | 3.7857 | 1.05090 | .28087 | 3.1789 | 4.3925 |
| | 8.00 | 4 | 3.5000 | 1.29099 | .64550 | 1.4457 | 5.5543 |
| | 9.00 | 2 | 4.0000 | 1.41421 | 1.00000 | -8.7062 | 16.7062 |
| | Total | 26 | 3.7308 | 1.04145 | .20424 | 3.3101 | 4.1514 |
| Pers5 | 2.00 | 2 | 4.5000 | .70711 | .50000 | -1.8531 | 10.8531 |
| | 3.00 | 3 | 4.3333 | .57735 | .33333 | 2.8991 | 5.7676 |
| | 6.00 | 1 | 5.0000 | . | . | . | . |
| | 7.00 | 14 | 4.2857 | .91387 | .24424 | 3.7581 | 4.8134 |
| | 8.00 | 4 | 4.2500 | .95743 | .47871 | 2.7265 | 5.7735 |
| | 9.00 | 2 | 4.5000 | .70711 | .50000 | -1.8531 | 10.8531 |
| | Total | 26 | 4.3462 | .79711 | .15633 | 4.0242 | 4.6681 |

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Pers1 | Between Groups | 1.572 | 5 | .314 | .156 | .976 |
| | Within Groups | 40.274 | 20 | 2.014 | | |
| | Total | 41.846 | 25 | | | |
| Pers2 | Between Groups | 6.322 | 5 | 1.264 | 1.295 | .305 |
| | Within Groups | 19.524 | 20 | .976 | | |
| | Total | 25.846 | 25 | | | |
| Pers3 | Between Groups | 6.027 | 5 | 1.205 | 1.129 | .377 |
| | Within Groups | 21.357 | 20 | 1.068 | | |
| | Total | 27.385 | 25 | | | |
| Pers4 | Between Groups | .592 | 5 | .118 | .089 | .993 |
| | Within Groups | 26.524 | 20 | 1.326 | | |
| | Total | 27.115 | 25 | | | |
| Pers5 | Between Groups | .611 | 5 | .122 | .160 | .974 |
| | Within Groups | 15.274 | 20 | .764 | | |
| | Total | 15.885 | 25 | | | |
| Pers6 | Between Groups | 5.226 | 5 | 1.045 | .727 | .612 |
| | Within Groups | 28.774 | 20 | 1.439 | | |
| | Total | 34.000 | 25 | | | |

```
ONEWAY Pers1 Pers2 Pers3 Pers4 Pers5 Pers6 BY Education
 /STATISTICS DESCRIPTIVES HOMOGENEITY
 /MISSING ANALYSIS
 /CRITERIA=CILEVEL(0.95).
```

| | | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Pers1 | 1.00 | 1 | 3.0000 | . | . | . | . |
| | 3.00 | 8 | 4.5000 | .92582 | .32733 | 3.7260 | 5.2740 |
| | 4.00 | 24 | 2.8333 | 1.43456 | .29283 | 2.2276 | 3.4391 |
| | 5.00 | 4 | 3.0000 | 1.15470 | .57735 | 1.1626 | 4.8374 |
| | Total | 37 | 3.2162 | 1.43634 | .23613 | 2.7373 | 3.6951 |
| Pers2 | 1.00 | 1 | 1.0000 | . | . | . | . |
| | 3.00 | 8 | 2.8750 | .83452 | .29505 | 2.1773 | 3.5727 |
| | 4.00 | 24 | 2.1667 | 1.27404 | .26006 | 1.6287 | 2.7046 |
| | 5.00 | 4 | 2.2500 | .95743 | .47871 | .7265 | 3.7735 |
| | Total | 37 | 2.2973 | 1.17532 | .19322 | 1.9054 | 2.6892 |
| Pers3 | 1.00 | 1 | 3.0000 | . | . | . | . |
| | 3.00 | 8 | 2.8750 | .99103 | .35038 | 2.0465 | 3.7035 |
| | 4.00 | 24 | 1.9167 | 1.05981 | .21633 | 1.4691 | 2.3642 |
| | 5.00 | 4 | 2.5000 | 1.29099 | .64550 | .4457 | 4.5543 |
| | Total | 37 | 2.2162 | 1.10893 | .18231 | 1.8465 | 2.5860 |
| Pers4 | 1.00 | 1 | 5.0000 | . | . | . | . |
| | 3.00 | 8 | 2.1250 | 1.24642 | .44068 | 1.0830 | 3.1670 |
| | 4.00 | 24 | 3.5417 | 1.17877 | .24061 | 3.0439 | 4.0394 |
| | 5.00 | 4 | 3.0000 | 1.82574 | .91287 | .0948 | 5.9052 |
| | Total | 37 | 3.2162 | 1.37710 | .22639 | 2.7571 | 3.6754 |
| Pers5 | 1.00 | 1 | 5.0000 | . | . | . | . |
| | 3.00 | 8 | 3.5000 | 1.06904 | .37796 | 2.6063 | 4.3937 |
| | 4.00 | 24 | 4.3750 | .64690 | .13205 | 4.1018 | 4.6482 |
| | 5.00 | 4 | 4.2500 | .50000 | .25000 | 3.4544 | 5.0456 |
| | Total | 37 | 4.1892 | .81096 | .13332 | 3.9188 | 4.4596 |
| Pers6 | 1.00 | 1 | 3.0000 | . | . | . | . |
| | 3.00 | 8 | 3.2500 | 1.16496 | .41188 | 2.2761 | 4.2239 |
| | 4.00 | 24 | 2.0000 | 1.31876 | .26919 | 1.4431 | 2.5569 |
| | 5.00 | 4 | 3.0000 | 1.82574 | .91287 | .0948 | 5.9052 |
| | Total | 37 | 2.4054 | 1.40356 | .23074 | 1.9374 | 2.8734 |

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Pers1 | Between Groups | 16.937 | 3 | 5.646 | 3.250 | .034 |
| | Within Groups | 57.333 | 33 | 1.737 | | |
| | Total | 74.270 | 36 | | | |
| Pers2 | Between Groups | 4.771 | 3 | 1.590 | 1.167 | .337 |
| | Within Groups | 44.958 | 33 | 1.362 | | |
| | Total | 49.730 | 36 | | | |
| Pers3 | Between Groups | 6.562 | 3 | 2.187 | 1.914 | .146 |
| | Within Groups | 37.708 | 33 | 1.143 | | |
| | Total | 44.270 | 36 | | | |
| Pers4 | Between Groups | 15.437 | 3 | 5.146 | 3.214 | .035 |
| | Within Groups | 52.833 | 33 | 1.601 | | |
| | Total | 68.270 | 36 | | | |
| Pers5 | Between Groups | 5.301 | 3 | 1.767 | 3.173 | .037 |
| | Within Groups | 18.375 | 33 | .557 | | |
| | Total | 23.676 | 36 | | | |
| Pers6 | Between Groups | 11.419 | 3 | 3.806 | 2.111 | .118 |
| | Within Groups | 59.500 | 33 | 1.803 | | |
| | Total | 70.919 | 36 | | | |

```
ONEWAY Pers1 Pers2 Pers3 Pers4 Pers5 Pers6 BY Language
 /STATISTICS DESCRIPTIVES HOMOGENEITY
 /MISSING ANALYSIS
 /CRITERIA=CILEVEL(0.95).
```

| | | | | | | 95% Confidence Interval for Mean | |
|---|---|---|---|---|---|---|---|
| | | N | Mean | Std. Deviation | Std. Error | Lower Bound | Upper Bound |
| Pers1 | 2.00 | 8 | 4.1250 | 1.55265 | .54894 | 2.8270 | 5.4230 |
| | 4.00 | 25 | 3.0400 | 1.24097 | .24819 | 2.5278 | 3.5522 |
| | 5.00 | 4 | 2.5000 | 1.91485 | .95743 | -.5470 | 5.5470 |
| | Total | 37 | 3.2162 | 1.43634 | .23613 | 2.7373 | 3.6951 |
| Pers2 | 2.00 | 8 | 2.2500 | 1.28174 | .45316 | 1.1784 | 3.3216 |
| | 4.00 | 25 | 2.3600 | 1.18603 | .23721 | 1.8704 | 2.8496 |
| | 5.00 | 4 | 2.0000 | 1.15470 | .57735 | .1626 | 3.8374 |
| | Total | 37 | 2.2973 | 1.17532 | .19322 | 1.9054 | 2.6892 |
| Pers3 | 2.00 | 8 | 2.3750 | 1.18773 | .41993 | 1.3820 | 3.3680 |
| | 4.00 | 25 | 2.2000 | 1.11803 | .22361 | 1.7385 | 2.6615 |
| | 5.00 | 4 | 2.0000 | 1.15470 | .57735 | .1626 | 3.8374 |
| | Total | 37 | 2.2162 | 1.10893 | .18231 | 1.8465 | 2.5860 |
| Pers4 | 2.00 | 8 | 2.7500 | 1.66905 | .59010 | 1.3546 | 4.1454 |
| | 4.00 | 25 | 3.3200 | 1.37598 | .27520 | 2.7520 | 3.8880 |
| | 5.00 | 4 | 3.5000 | .57735 | .28868 | 2.5813 | 4.4187 |
| | Total | 37 | 3.2162 | 1.37710 | .22639 | 2.7571 | 3.6754 |
| Pers5 | 2.00 | 8 | 3.8750 | .99103 | .35038 | 3.0465 | 4.7035 |
| | 4.00 | 25 | 4.2800 | .73711 | .14742 | 3.9757 | 4.5843 |
| | 5.00 | 4 | 4.2500 | .95743 | .47871 | 2.7265 | 5.7735 |
| | Total | 37 | 4.1892 | .81096 | .13332 | 3.9188 | 4.4596 |
| Pers6 | 2.00 | 8 | 3.5000 | .92582 | .32733 | 2.7260 | 4.2740 |
| | 4.00 | 25 | 2.1200 | 1.45258 | .29052 | 1.5204 | 2.7196 |
| | 5.00 | 4 | 2.0000 | .81650 | .40825 | .7008 | 3.2992 |
| | Total | 37 | 2.4054 | 1.40356 | .23074 | 1.9374 | 2.8734 |

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Pers1 | Between Groups | 9.435 | 2 | 4.718 | 2.474 | .099 |
| | Within Groups | 64.835 | 34 | 1.907 | | |
| | Total | 74.270 | 36 | | | |
| Pers2 | Between Groups | .470 | 2 | .235 | .162 | .851 |
| | Within Groups | 49.260 | 34 | 1.449 | | |
| | Total | 49.730 | 36 | | | |
| Pers3 | Between Groups | .395 | 2 | .198 | .153 | .859 |
| | Within Groups | 43.875 | 34 | 1.290 | | |
| | Total | 44.270 | 36 | | | |
| Pers4 | Between Groups | 2.330 | 2 | 1.165 | .601 | .554 |
| | Within Groups | 65.940 | 34 | 1.939 | | |
| | Total | 68.270 | 36 | | | |
| Pers5 | Between Groups | 1.011 | 2 | .505 | .758 | .476 |
| | Within Groups | 22.665 | 34 | .667 | | |
| | Total | 23.676 | 36 | | | |
| Pers6 | Between Groups | 12.279 | 2 | 6.139 | 3.560 | .039 |
| | Within Groups | 58.640 | 34 | 1.725 | | |
| | Total | 70.919 | 36 | | | |

# BIOGRAPHICAL SKETCH

Rosa Nelda Benavidez was born in Victoria Tamaulipas, Mexico and was raised in Matamoros, Tamaulipas, Mexico. Rosa obtained her Bachelor of Science degree with a major in Communication Sciences and Disorders from the University of Texas at Austin in 2016. In May of 2021, Rosa obtained her Master of Science degree with a major in Communication Sciences and Disorders from the University of Texas, Rio Grande Valley. Rosa is bilingual in Spanish and English and she is currently interested in autism spectrum disorder, multicultural populations, early intervention, apraxia of speech, research, and augmented and alternative communication.

Rosa plans to obtain her certificate of clinical competence from the American Speech Language Hearing (ASHA) Association and become a licensed speech and language pathologist subsequent to completing her clinical fellowship.

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