

ENGLISH AND NON-ENGLISH-SPEAKING FAMILIES UTILIZING  
AUGMENTATIVE AND ALTERNATIVE COMMUNICATION (AAC) AT HOME

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## **ABSTRACT**

The author investigated the usage of Augmentative and Alternative Communication (AAC) within the context of a sequential mixed methods research design in order to examine the relationship between home language and factors which facilitated or hindered its application in home environments. The study analyzed data from thirteen parents of school-aged children representing seven different languages spoken at home. The findings suggest that AAC use is not negatively impacted by the primary home language, despite the fact that 75% of the non-English-speaking children in the study do not have AAC solutions that support their primary language. Both English-only and non-English-only children consistently use AAC at equivalent rates. According to survey and interview participant answers, the hypothesis that AAC use for both English-only and non-English-only families will be positively influenced by increased family input and training can neither be corroborated nor refuted. Both English-only and non-English-only children of parents participating in the study consistently used AAC at equivalent rates. According to survey and interview participant answers, the hypothesis that AAC use for both English-only and non-English-only families will be positively influenced by increased family input and “training” can neither be corroborated nor refuted. Both English-only and non-English-only groups continue to benefit from access to evidence-based practices to support their child’s augmentative and alternative communication methods.

*Keywords:* Augmentative and Alternative Communication (AAC), home language, family input, assessment, evidence-based practices.

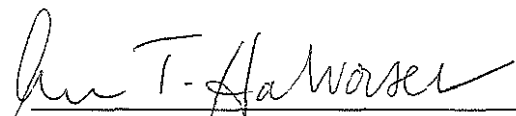
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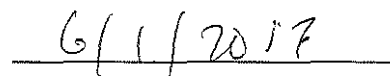
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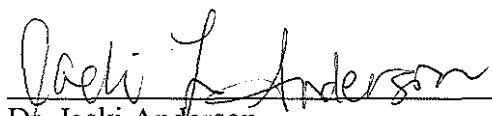
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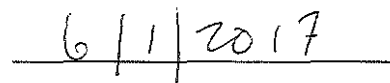
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## **DEDICATION AND ACKNOWLEDGEMENTS**

I would like to dedicate this thesis to the many supportive people in my life. My parents, Noreen and Albert Isola, have given me a love that only a mother and father could provide. They have stood at my side for all of the many triumphs and sorrows that life has bestowed upon me, and provided me with the formative experiences necessary for my success. In addition, I would like to thank my husband, Wesley Alder, who has believed in me when I faltered and reminded me that I am capable of realizing my dreams.

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-Elizabeth Alder

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## **CHAPTER ONE**

### **INTRODUCTION**

Communication is everything, I think. (Marshall & Goldhart, 2008, p.77).

Every child is entitled to the equal right to learn about his or her environment and communicate with others. The National Joint Committee for the Communication Needs of Persons With Severe Difficulties (1992) further indicates that this freedom extends to include the right to “affect, through communication, the conditions of their existence” (Communication Bill of Rights section, para. 1). Additionally, the United Nations Convention on the Rights of Persons with Disability (2006) affirms that individuals also have the right to choose the manner in which they communicate (Freedom of Expression and Opinion, and Access to Information, Article 21). Persons with disabilities are to be afforded the same human rights and respect that every member of society is entitled.

#### **General Statement of the Problem**

The ability to communicate enables individuals to learn about, interact with, and control their environment. While many of us interrelate with our world via verbal means, not all individuals have the capacity to use speech in this way. A delay or lack of oral communicative ability is often the result of congenital, acquired, or degenerative impairments. These influences on oral speech have the potential to indicate that these individuals may require an augmentative or alternative means to access learning and

communication. They may benefit from, and employ, what is known as augmentative or alternative communication (AAC). AAC has a multitude of possibilities, ranging from “no-tech” (e.g. sign language,) to “low-tech” (e.g. pictures, icons, and simple voice output devices) to “high-tech” (e.g. devices that produce digital or recorded speech and are more sophisticated than their “low-tech” counterpart) (Bailey, Parette, Stoner, Angell, & Carroll, 2006; Downing, 1999; Parette, Brotherson, & Huer, 2000). The strategy and type of technology chosen is specific to the individual and is designed upon his or her cognitive, physical, and social needs. These requirements are determined through a comprehensive, multi-disciplinary team process which includes a detailed analysis of a person’s current functional speech patterns, the person’s current and expected future and potential environments, the demands of those potential and current communication partners, and communication outcomes set with the family and individual where possible.

The primary focus of AAC research is to determine which strategies will promote the success of an individual’s language development. The impact that family has on an individual’s learning and application of a communication strategy is often included in this body of research. Current research emphasizes the need for family involvement. Investigation into the role of the family is imperative. In a qualitative analysis of current research in this area, Baxter, Enderby, Evans and Judge (2012) noted multiple references to the inherent need for professionals to incorporate family members’ attitudes and needs in any discussion about augmenting a child’s mode of communication (p. 122). This is due to the potential impact, both positive and negative, that AAC can have with both the communicator and his or her primary communicative partners. Meaningful examination

into familial prerequisites and expectations in regards to AAC use and implementation is fundamental to ascertaining this stated goal.

### **Background of the Problem**

The most recent reauthorization of the Individuals with Disabilities Education Act (IDEA) occurred in 2004 (updated from the previously enacted federal PL 94-142 law known as The Education for All Handicapped Children Act of 1975 and subsequent authorizations from the original IDEA in 1990) in order to delineate and regulate educational services for children with disabilities who reside in the United States. This Act seeks to define the requirements that schools, school districts and states must comply with in order to address the unique needs of children with disabilities. States and school districts are mandated to implement Procedural Safeguards to ensure fulfillment of this obligation. It is an educational rights and appropriation law, as it provides some of the funding for special educational services to states. The Act also includes federal and state legal obligations, ranging from state funding and services to be provided to students, to the role of specific team members in decision-making tasks (IDEA, 2004). IDEA specifies that an Individualized Education Program (IEP) be implemented for each child in order to document present levels of the student's current skills across academic, motor, communication, social domains and various environments. The law delineates specific goals that are intended to support the student's learning through both instructional and behavioral intervention and adaptation, and reduce the discrepancy between the student and age-appropriate developmental milestones and grade level skills. These goals and

special education services that are intended to support and instruct the student are in place to support continued growth in academic and other key educational performance areas according to a Free and Appropriate Public Education (FAPE)

### *IDEA and Assistive Technology*

IDEA (2004) gives IEP team members the responsibility to determine if assistive technology (AT) is necessary to help accomplish these goals. Assistive technology is defined as “any item, piece of equipment, or product system...used to increase, maintain, or improve functional capabilities of a child with a disability” (IDEA, sec. 602 (1).

Additionally, these technologies are to be accompanied by:

...any service that directly assists a child with a disability in the selection, acquisition, or use of an assistive technology device. Such terms include-

(A) the evaluation...

(B) purchasing, leasing, or otherwise providing for the acquisition of assistive technology devices...

(C) selecting, designing, fitting, customizing, adapting, applying, maintaining, repairing, or replacing...

(D) coordinating and using other therapies, interventions, or services with assistive technology devices...

(E) training or technical assistance for such child, or the family of such child...

(F) training or technical assistance for professionals... (IDEA, 2004, sec. 602(2)).

Augmentative and alternative communication technologies are included under these federal guidelines. This type of technology is specifically related to increasing a child's

ability to functionally communicate and enables meaningful participation in his or her environment. Therefore, users of AAC are entitled to the same provisions, as stated above, under the law.

### *IDEA and Parental Representation*

Another explicit mandate of IDEA is that students are to be represented by his or her parents (or legal guardians) in the development of the IEP. According to IDEA:

The parents of a child with a disability must be afforded an opportunity to participate in meetings with respect to... the identification, evaluation, and educational placement of the child; and... the provision of FAPE to the child (IDEA Regulations: Part [300](#) / [E](#) / [300.501](#) / b).

These laws governing parental involvement support the assertion that family input is crucial to developing an educational program that is in the best interest of the child. These rules and regulations are so important that IDEA requires each state to outline specific measures they are taking to include families in the decision-making process as part of a State Performance Plan. Parents/guardians provide insight into their child's social, emotional, and academic development and are therefore stakeholders in their child's education. Strengths and weaknesses, preferences and indifferences, are all unique characteristics that can be identified by familial resources and are to be viewed as such in order to ensure the stated goals of IDEA (Ohio Department of Education, 2014, Who are the Parents?, para. 1).

Parental involvement in the IEP process is also instrumental for the successful inclusion of AT/AAC into a student's life. It is imperative that members of the IEP team, including academic professionals and family members of the student, and the student

when possible, work together to determine which type of communication systems, services and products will be best suited to accomplish established goals. Also, because AAC is specifically related to overall communication, the team decision must consider how to be effective in each of the student's environments- home as well as school and other locations. It is important that school officials recognize that language and communication development is not only taught and learned in a traditional six-hour, five days a week school schedule, but is rather an ever-evolving process that continues at home. Hence, the ultimate goal of AAC is, for example, to express one's opinion, one's wants, preferences and needs, to comment, to ask questions, to express feelings and engage in discussion with friends. In other words, it is used to participate in *all* areas of one's life. It is only through communication and collaboration between professionals and family members that this can be achieved.

### *Cultural Context and Impacts*

When referencing parents/guardians (and additional family members as a logical extension,) school professionals must acknowledge that collaboration is affected by the individual belief system of every member of the IEP team. When referencing the distinction between current assessment models and intervention approaches, Beukelman and Mirenda (2013) point out that "Anglo-European ideals and values tend to predominate, even though they may conflict with the values embraced by families from other cultural groups (p. 123). Hence, it can be extrapolated that the cultural lens through which a person views relevant communicative practices plays a principle role. A key

component to a family group is how they personally identify with the dominant American culture in reference to their own native culture and primary language. Historically, individuals who classify their primary language as other than English or self-identify as belonging to multiple cultures have been under-represented in the assessment and use of AAC. (The implications for this disparity will be further explored in Chapter Two).

Despite this possibility, professionals are obligated to operate beyond this dominant habit.

Not only is the consideration of family needs a research-based practice in the field of Special Education, it is both federal and state law. There are specific rules under IDEA regarding instruction for individuals whose family does not speak English as their primary language. Students who are predominantly exposed to a language other than English at home are identified as being English Learners and must be educated accordingly (IDEA,2004).This highlights the fact that language developmental needs are not legally bound to be taught only in English; AAC determination must follow these same guiding principles. Cultural and linguistic variances within student populations need to be addressed in order to assure that AAC is used both at school and at home. The family's influence over AAC use is vital to bridge the "home/school" connection. This research study is a reflection upon the needs of children, ages three-21, and their families, in regards to AAC and assistive technology specific to communication. Furthermore, this investigation seeks to establish an assessment of what English-only speaking families need and want in order to effectively use AAC at home in comparison to families who identify, either primarily or in conjunction with, non-English-speaking families.

*Assessing Augmentation Strategies Appropriate for the Child*

The decision-making factors that affect AAC practice typically center on choosing the most effective AAC device/strategy, the identification of funding sources, and deciding how the device will be implemented and generalized within the context of a users' environment and communication partners. Assessment and eventual identification of the above components are key aspects in increasing language development. A trans-disciplinary approach to AAC evaluation is based upon the understanding that the assessment process is governed by the particularized interests of all Team members and ensures that all stakeholders have equally valuable input. Beukelman and Mirenda (2013) reflect on the responsibilities of those involved with assessment by stating that potential roles on the Team include at least: People with complex communication needs (CCN); AAC facilitators; AAC finders; general practice clinicians or educators; AAC specialists, and AAC experts. These individuals focus on different aspects of developing a complete communication system according to their specific expertise and function. For example, a facilitator's role focuses on "support[ing] the individual with CCN to communicate as independently as possible," while an Augmentative and Alternative Communication Specialist provides direct intervention services that "instruct and educate others about AAC, and they design and implement unique or complex AAC interventions" (Beukelman & Mirenda, 2013, pp. 103-4). Family members may act as representatives of the individual with CCN if necessary. These associated guidelines are reflected throughout the research in this field. As such, any decisions made about selecting



appropriate AAC strategies need to be considered with the above interests in mind for effective implementation.

Systematic, evidence-based practices exist for determining augmentative and alternative communication techniques. The American Speech-Language-Hearing Association is a proponent and staunch advocate of evaluating technology and strategies related to AAC using the Participation Model, which includes various modes of evaluation (ASHA, 2004, "Roles and Responsibilities," Participation Model section, par 2). The Participation Model has been an integral approach to assessment primarily because it is based upon using communication in a functional context across multiple settings. The identification of current and future participation patterns and communication needs is a basic tenet to this principle. It supports a multi-modal methodology for assessment, which includes, but is not limited to: informal assessment; formal assessment; professional judgment, and sometimes specific Team member requests. Informal assessment tends to look at using communication in one environment. An example of this is a classroom teacher whose communication goal for their student is related to instruction, such as answering questions or making progress on school-based IEP goals. In this context, consideration of other communicative environments for the student may not be fully taken into account. Although this style may not provide a comprehensive viewpoint of the whole person, some value can still be derived from such a technique because it provides a snapshot of the individual within one purposeful context. Formal assessments, on the other hand, tend to be more comprehensive in nature and rely on multiple factors to determine appropriateness of AAC. Issues related to the

unique needs of the child, family, school, and specific technology are common themes (Binger, et al., 2012). Formal measures of assessment, such as the Wisconsin Assistive Technology Initiative (WATI) or the Georgia Project for Assistive Technology, consider the child as a whole, and not in isolated environments. These formal measures assess communication across environments. In addition to informal and formal evaluations, a Team member may forego any type of assessment and request a specific commercially-available technology device. Asking for a particular device can be a reflection of seeing something “cool” in a catalog, a Team member’s familiarity and experience with a device, or word-of-mouth about how a device was effective for someone else with similar needs. Working with a specific company who sells only a small selection of devices may negatively influence decision-making. In this case, the company has a vested financial interest in obtaining approval from the funding agency and is therefore aimed at convincing the agency representative that their product is superior to others. The advantage to accessing vendors, however, is that they can temporarily loan devices for a student to try at home and at school (Dietz, Quach, Lund & McKelvey, 2012; Binger, et al., 2012). Hands-on experience with a piece of equipment may be beneficial after other assessment tools have been employed. Non-profit organizations such as Assistive Technology Centers and Parent Resource Centers may be able to provide this type of lending library function as well.

While all of the aforementioned processes have been historically used, formal assessment of a child’s communication abilities in its totality remains the best practice. In an effort to synthesize and clearly delineate professional roles related to augmentative

and alternative communication, Binger, et al (2012) developed an AAC Assessment Personnel Framework. The Framework was adapted from the earlier work of Beukelman, Ball, and Fager (2008), which did not specifically address evidence-based practices regarding AAC assessment procedures. Binger, et al (2012) offers a glimpse of two types of standardized assessment: clinical-decision support systems (CDSS) and assessment traditionally performed by AAC clinical specialists. AAC Device Assistant (AAC TechConnect, 2012), is an example of a CDSS which relies on software to advise Speech and Language Pathologists on which AAC path is best for the particular individual. Pathologists answer questions regarding a students' language profile and the software program will theoretically offer technological solutions to linguistic augmentation strategies and devices. Binger et. al (2012) also offer examples of formal measures for AAC consideration, including: the Test of Aided-Communication Symbol Performance, the Multimodal Communication Screening Task for People with Aphasia, the Wisconsin Assistive Technology Initiative, and assessment software which is pre-programmed into certain speech-generating devices. Both of these types of measurements are successful because they are aimed to look at the whole child across multiple environments. Many formal assessment tools (e.g., WATI) take into account fine and gross motor abilities, cognitive and communicative qualities, and question communication interaction skills of the child.

In addition to considering overall AAC needs, a major component to a thorough assessment is the inclusion of family member input. When considering the relationship between special educators and family, Deliberato and Manzini (2012) point out that

“interlocutors of different social backgrounds” are not able to completely understand the unique cultural and communal aspects of a child’s natural environment (p. 195).

Furthermore, the authors assert that AAC assessors are able to “[identify] the routine within these natural environments and additional information about children and youth with severe communication needs through their families’ reports,” which inevitably “provides professionals with greater control during the process of implementing AAC resources for different users” (Deliberato & Manzini, 2012, p. 195). These statements regarding the importance of family result from the authors’ qualitative research of eleven parents of children affiliated with a rehabilitation program in a public university in Brazil. Communication in natural home environments rely heavily on basic and fringe vocabulary that is unique to each household. This reality speaks to the fact that while school district professionals may have the formal education background knowledge to determine suitable interventions, families are the ones who have the most insight into their child and his or her needs. When considering a child’s needs outside of the school setting, it is essential that professionals establish and understand the child in all environments.

### **Significance of the Problem**

While research has been conducted to determine best practices in AAC use at home and at school, there continues to be a lack of focus on how a family’s use of language affects a child’s effective communication. Specifically, which strategies (which may or may not be utilized in school environments,) can families employ at home to

increase the likelihood that their child will learn and use their AAC system to the greatest capacity with them at home and in other settings? Research verifies that each augmentative strategy should be carefully selected for the individual communicator and thus will ultimately hold the key to unlocking a plethora of learning and communicative potential. How is it then, if the many possibilities of learning and communication can be accessed through AAC, that not all eligible individuals are currently making use of these techniques? Many reasons have been hypothesized, including funding and knowledge of professionals who support or teach them. And yet, why are some students less successful in fully utilizing AAC resources even once they do gain access? Through my own experiences as a special education teacher, I have become aware of the reality that parental and professional support for AAC use is a critical factor in a child learning and in making use of these important tools. In fact, in my experience, the home-school connection can be a “make it or break it” factor. Given that a parent/guardian has the potential to have such an immense impact on the development of learning and communication, it is essential that we identify factors that contribute to the successes or non-successes of using AAC in the home. Important questions to be asked include:

1. What are the issues that influence the willingness of the family to actively use the device?
2. How are these factors affected by home language needs, if at all? Do English-only and non- English speaking (including multilingual households where English is spoken but is not considered the primary language) families experience similar

or different frustrations or concerns? What would these families determine support for effective AAC use to look like?

3. What strategies would enable a parent to most effectively support and communicate using AAC with their child? Are there certain factors that limit or even preclude a family from using it that are related to school professionals and how they interact with family members?

Existing literature examines some of these questions, but addresses them in isolation. In particular, I am interested in investigating the potential effects of family home language, if any, on AAC -assisted language development. This study is an attempt to address the question: Do families that speak a language other than English (or multiple languages) at home have similar types of experiences with AAC and similar perceptions of the outcomes of AAC use as do English-only families?

### **Definition of Terms**

The Oxford Dictionary defines “Communication” as an act of “imparting or exchanging of information by speaking, writing, or using some other medium” for the purpose of “the successful conveying or sharing of ideas and feelings” (Retrieved from [www.oxforddictionaries.com/communication](http://www.oxforddictionaries.com/communication)). Given this definition, several implications for educating children with disabilities can be drawn. Primarily, communication is intrinsically embedded in academic instruction. In general, children are educated in a language-rich classroom, in which students are expected to absorb the information given

to them by the teacher and then demonstrate their subject matter comprehension back to the teacher. It is assumed that the student is both able to understand what is being taught and that he or she can effectively recount the information. In addition to communication being used to learn, the second part of its definition is to form relationships where wants, needs, and emotions, are shared. The ability to express oneself in academic and social environments is an inherent component to communication. The term Augmentative Alternative Communication (also referred to as AAC and a sub-category of assistive technology, also referred to as AT) has been defined by many sources, including the American Speech-Language-Hearing Association (ASHA). Speech and Language Pathologists and Audiologists are certified by ASHA and are mandated to fulfill ongoing education to maintain their certification. This organization states that AAC “includes all forms of communication (other than speech) that are used to express thoughts, needs, wants, and ideas” (ASHA, 2015, para. 1). Communication books, Picture Exchange Communication, manual signing, and gestures are included in this definition. Electronic voice outputs, otherwise known as speech generated devices, have also been recommended by many professionals. Children who use AAC frequently use a combination of communication strategies, depending upon the situation. This practice is consistent with how humans converse in general. AAC is an extension of a child’s ability to communicate as defined above. The nature of communication is enhanced by giving an individual the tools and supports to use them effectively.

The “home-school connection” highlights the importance of collaboration between parents and teachers in a child’s education. Since a child’s time is divided

between being at school and being at home, it is logical that children are affected by these alternate environments. Making connections between these two resources exponentially increases the chances that a child can learn to use AAC technology (Bausch and Ault, 2008). Collaboration between home and school includes, but is not limited to, details established through formal IEP meetings and informal AAC implementation plans. Daily or weekly communication logs that specifically address student present levels of functioning with their AAC is one way to maintain this relationship.

The word “culture” has been articulated by many sources in reference to the role it plays in determining best practices related to AAC. The National Institutes of Health (2015) subscribes to the definition of culture as “the combination of a body of knowledge, a body of belief and a body of behavior... [including] personal identification, language, thoughts, communications, actions, customs, beliefs, values, and institutions that are often specific to ethnic, racial, religious, geographic, or social groups” (Cultural Competency, para. 1). Several researchers, (e.g., Beukelman & Mirenda, 2013, 2005; Fahim & Nedwick, 2014; Parette, 1995) have imparted the importance of keeping issues of culture at the forefront of determining which communication system will be most beneficial to the student. Since each member of the IEP team brings his or her own culture to the discussion, including professionals and families, all cultures should be respected and appropriately represented for the expressed benefit of the child.

According to the September 2015 California Department of Education (CDE) review, English Learners (ELs) are defined as students who meet two qualifications: reported home use of a primary language other than English on the Home Language



Survey and an assessed insufficient use of English language skills to adequately perform in conventional classroom instruction (CDE Glossary of Terms, English Learner (EL) Students). Both requirements have been established in order to identify students who could potentially benefit from additional education in English Language Development (ELD) teaching and learning strategies. The Home Language Survey encompasses households in which a non-English language is spoken, regardless of the percentage of time spent using the non-English language. For the purpose of this study, EL includes bilingual (speaking two languages), multilingual (speaking three or more languages), and non-English-only (speaking only a language other than English) families. Students who qualify for Special Education services are subject to the same legal requirements as demarcated by these specified terms, and therefore, may qualify under both categorical descriptors.

### **Statement of Purpose**

This research study used a pragmatic research paradigm (Mertens, 2014) to look at how a family's primary language (English or non-English) affects the child's learning and use of AAC. A sequential mixed methods research design was implemented to establish correlational data, thereby relating the pragmatic paradigm to the identification of relationships in order to enable explanation of research question phenomena. The research was designed to contribute to the question: What is the relationship between family home language and student AAC use?

Quantitative data from families whose children are identified as using AAC in (school district not identified to protect anonymity) was obtained through survey data collection and analyzed to ascertain which factors contributed to AAC use at home and in other non-school settings. Qualitative data was collected from a sample of respondents to the survey who agreed to be interviewed with more probative, in-depth questions. The qualitative data from parent/guardian interviews was examined to ascertain patterns of AAC application and utilization at home across English and non-English-speaking families. Both quantitative and qualitative research components were available in English and/or other languages according to language needs. Quantitative and qualitative data were evaluated according to the established research protocols.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

A large body of research on Augmentative and Alternative Communication use examines the relationship and collaboration between the family and professionals who are integral to a student's learning. The reason for this, of course, is that a child is a multi-dimensional being, who cannot be defined by one single environment or by one single person associated with them. It is essential that their communication needs be addressed with this in mind. For school-aged children who have communication-related disabilities which will be addressed in part through AAC, all members of the Individual Education Program (IEP) Team are influential in establishing and monitoring its use. In the existing literature, the family system is at least commensurate with that of school education professionals. There is a common thread that emphasizes that the importance of the familial role is indicated because "[u]nderstanding the child's linguistic and cultural environment is essential" to ascertaining support needs of all potential communicative partners (Fahim & Nedwick, 2014, p. 6). Valuing input from all stakeholders increases the likelihood that the child will integrate communication strategies in multiple contexts. It is therefore imperative that schools and families collaborate and plan carefully to support any child who is learning to use or is currently using AAC. "Collaboration between general educators, families, special educators and speech language pathologists will be paramount to the successful implementation of this process" (Henneberry, Kelso & Soto, 2012, p. 92).

### **Assessing Augmentation Strategies Appropriate for the Child**

The decision-making factors that affect AAC practice typically center on choosing the most effective AAC device/strategy, the identification of funding sources, and deciding how the device will be implemented and generalized within the context of a users' environment and communication partners. Assessment and eventual identification of the above components are key aspects in increasing language development. A trans-disciplinary approach to AAC evaluation is based upon the understanding that the assessment process is governed by the particularized interests of all Team members and ensures that all stakeholders have equally valuable input. Beukelman and Mirenda (2013) reflect on the responsibilities of those involved with assessment by stating that potential roles on the Team include at least: people with complex communication needs (CCN,) AAC facilitators, AAC finders, general practice clinicians or educators, AAC specialists, and AAC experts (p. 102). These individuals focus on different aspects of developing a complete communication system according to their specific expertise and function. For example, a facilitator's role focuses on "support[ing] the individual with CCN to communicate as independently as possible," while an Augmentative and Alternative Communication Specialist provides direct intervention services that "instruct and educate others about AAC, and they design and implement unique or complex AAC interventions" (Beukelman & Mirenda, 2013, pp. 103-4). Family members may act as representatives of the individual with CCN if necessary. These associated guidelines are reflected throughout the research in this field. As such, any decisions made about

selecting appropriate AAC strategies need to be considered with the above interests in mind for effective implementation.

Systematic, evidence-based practices exist for determining augmentative and alternative communication techniques. The American Speech-Language-Hearing Association is a proponent and staunch advocate of evaluating technology and strategies related to AAC using the Participation Model, which includes various modes of evaluation (ASHA, 2004, "Roles and Responsibilities," Participation Model section, para. 2). The Participation Model has been an integral approach to assessment primarily because it is based upon using communication in a functional context across multiple settings. The identification of current and future participation patterns and communication needs is a basic tenant to this principle. It supports a multi-modal methodology for assessment, which includes, but is not limited to: informal assessment, formal assessment, professional judgment, and sometimes specific Team member requests. Informal assessment tends to look at using communication in one environment. An example of this is a classroom teacher whose goal for their student is related to instruction, such as answering questions or making progress on school-based IEP goals. In this context, consideration of other communicative environments for the student may not be fully taken into account. Although this style may not provide a comprehensive viewpoint of the whole person, some value can still be derived from such a technique because it provides a snapshot of the individual within one purposeful context. Formal assessments, on the other hand, tend to be more comprehensive in nature and rely on multiple factors to determine appropriateness of AAC. Issues related to the unique needs

of the child, family, school, and specific technology are common themes (Binger, et. al, 2012). Formal measures of assessment consider the child as a whole, and not in isolated environments. In addition to informal and formal evaluations, a Team member may forego any type of assessment and request a specific commercially-available technology device. Asking for a particular device can be a reflection of seeing something “cool” in a catalog, a Team member’s familiarity and experience with a device, or word-of-mouth about how a device was effective for someone else with similar needs. Working with a specific company who sells only a small selection of devices can also influence decision-making. In this case, the company has a vested financial interest in obtaining approval from the funding agency and is therefore aimed at convincing the agency representative that only their product will work for the child. The advantage to accessing vendors, however, is that they can temporarily loan devices for a student to try at home and at school (Dietz, Quach, Lund & McKelvey, 2012; Binger, et al., 2012). Hands-on experience with a piece of equipment may be beneficial after other assessment tools have been employed. While all of the aforementioned processes have been historically used, formal assessment of a child’s communication abilities in its totality remains the best practice. In an effort to synthesize and clearly delineate professional roles related to augmentative and alternative communication, Binger, et al (2012) developed an AAC Assessment Personnel Framework. The Framework was adapted from the earlier work of Beukelman, Ball, and Fager (2008), which did not specifically address evidence-based practices regarding AAC assessment procedures. Binger, et al (2012) offers a glimpse of two types of standardized assessment: clinical-decision support systems (CDSS) and

assessment traditionally performed by AAC clinical specialists (pp. 282-283). AAC Device Assistant (AAC TechConnect, 2012), is an example of a CDSS which relies on software to advise Speech and Language Pathologists on which AAC path is best for the particular individual. Pathologists answer questions regarding a student's language profile and the software program will theoretically offer technological solutions to linguistic augmentation strategies and devices. Binger et. al (2012) also offer examples of formal measures for AAC consideration, including: the Test of Aided-Communication Symbol Performance, the Multimodal Communication Screening Task for People with Aphasia, the Wisconsin Assistive Technology Initiative, and assessment software which is pre-programmed into certain speech-generating devices (p. 282). Both of these types of measurements are successful because they are aimed to look at the whole child across multiple environments. Many formal assessment tools take into account fine and gross motor abilities, cognitive and communicative qualities, and question communication interaction skills of the child.

In addition to considering overall AAC needs, a major component to a thorough assessment is the inclusion of family member input. When considering the relationship between special educators and family, Deliberato and Manzini (2012) point out that "interlocutors of different social backgrounds" are not able to completely understand the unique cultural and communal aspects of a child's natural environment (p. 195). Furthermore, the authors assert that AAC assessors are able to "[identify] the routine within these natural environments and additional information about children and youth with severe communication needs through their families' reports," which inevitably

“provides professionals with greater control during the process of implementing AAC resources for different users” (Deliberato & Manzini, 2012, p. 195). Communication in natural home environments rely heavily on basic and fringe vocabulary that is unique to each household. This reality speaks to the fact that while school district professionals may have the formal education background knowledge to determine suitable interventions, families are the ones who have the most insight into their child and his or her needs. When considering a child’s needs outside of the school setting, it is important that professionals establish and understand the child in all environments.

Within the literature regarding the importance of including family members in the assessment process is a minimally-discussed sub-category which addresses the needs of families who speak a language other than English or who speak an alternate language in addition to English. Written on behalf of the *United States Census Bureau*, Gambino, Acosta, and Grieco (2014) published a report indicating that the population size of individuals in the United States who were not born as a U.S. citizen has risen considerably from 14.1 million in 1980 to 40.8 million in 2012. Of these identified individuals, the number of people who spoke a language other than English at home also rose from 70.2% in 1980 to 84% in 2012. The data can be extrapolated to reveal that an increasing prevalence of families in this country who speak a language other than English will therefore translate to mean more children with significant communication delays will also be born into these households. Bilingual and multi-lingual families who have students with CCN require another layer of consideration for AAC assessment teams because there is an additional data requirement for successful integration of AAC at



home. In their qualitative case study discussion of supporting three families who have preschool-age students with Autism Spectrum Disorders who are dual language learners, Fahim and Nedwick (2014) contend that “it is essential to have an understanding of the culture and to have the flexibility to appreciate that mainstream views and recommendations considered during intervention planning may not be the most appropriate” (p. 8). They point to the variations of social-communication skills that exist within cultures such as eye contact and shaking hands, among other routine family activities such as bedtime practices, to validate their claims (Fahim & Nedwick, 2014, p.7). Family language (English or otherwise,) and cultural considerations are paramount components to any holistic AAC assessment.

### **Defining “Success” Versus “Non-success”**

After all of the above augmentative and alternative communication assessments have been concluded and the device is purchased, some Teams may end their discussions here. They may have expectations that the child will use the technology straightaway. In spite of this, Team members must acknowledge that this is just the beginning for the AAC user. Simply *acquiring* a device is not enough; rather, it is *how* the device is used that is the ultimate test of successful communication. But, what is success? And, what does this look like for various Team members, including English-speaking-only families and non-English-only-speaking families? The *Merriam-Webster Dictionary* (2015) defines success as “the correct or desired result of an attempt” and a “favorable or desired outcome” (“Success” section, para. 1). In regards to assistive technology, a

desired outcome would be the whole reason why AAC assessment was conducted in the first place: to allow the child to have a voice in matters pertaining to him or her. Conversely, it can be extrapolated that non-success can be regarded as having the opposite effect; that is, the technology is ineffective in attaining the stated goals of assessment. Abandonment, or rejection, of the AAC strategy or device is a direct implication of an unsuccessful intervention (Calculator, 2012; Judge & Townend, 2013). It is important to take into consideration that successful outcomes in AAC can be tied to “children’s abilities to express themselves more effectively [than without AAC intervention], eliciting functional outcomes in response to their communicative attempts” (Calculator, 2012, p. 564).

For AAC use to be an effective and successful intervention, the literature suggests that it is imperative for family members to be central members of the decision and implementation team because there is often a high risk of device abandonment if the home-school connection falters. In an effort to understand perceptions regarding barriers and facilitators for AAC users and their supporters, Baxter, Enderby, Evans, and Judge (2012) systematically reviewed 27 current research papers which revealed several themes associated with the implementation needs of families whose children use AAC of a high-technology quality. They found that “ease of use; reliability; technical support; the voice and language of the device; the decision-making process; family perceptions and support; staff training; the speed of generating a message; communication partner responses; and service delivery issues such as staff training, and access to services” were the most frequently talked about features (Baxter, Enderby, Evans & Judge, 2012, p. 118). Each of

these general themes attempts to focus on areas of AAC that will ensure best practices in that area of research are being taught and utilized. For the purposes of this current research, family needs regarding ease of use, the voice and language of the device, and family perceptions and support will be investigated in reference to families who only speak English at home contrasted with non-English-speaking or bilingual families.

### **Ease of Use**

The context of “Ease of Use,” as outlined by Baxter et al. (2012), is in reference to the level of simplicity and effortlessness that an AAC device or strategy can be implemented by both the individual with complex communication needs and his or her communication partners (pp. 118 and 121). The usability features of an effective system include how easy it is for the child to access and operate the tools in a meaningful context, the ability of others to use the device in a supportive role, and the components of the apparatus. Acquisition, in reference to the ability for an individual to learn and use devices to communicate, is an essential component (Achmadi, Sigafos, van der Meer, Lancioni, O’Reilly, Hodis, Green, McLay, et al., 2014, p. 566). Since the ultimate goal of AAC intervention is to aide in making the “*possible* become *probable*,” it is imperative that these characteristics are present (Light & McNaughton, 2012, p. 36).

In an effort to determine which factors contributed to successful use of prescribed AAC, Judge and Townend (2013) conducted interview and survey research with individuals who use AAC to communicate, their caregivers, and professionals who work with clients who use aided communication. The first stage of this two-pronged approach

consisted of conducting interviews with eighteen individuals who lived in Northern England, used mid to high-tech VOCAs to produce more than 20 words, and were of secondary school age or older. These AAC users were asked to reflect upon their devices and provide feedback to the researchers about their experiences with their communication aids. Stage two of the design consisted of yielding quantitative data derived from questionnaires. The inclusion criteria for respondents included users of any type of aided communication, their caregivers, and the professionals who work with them. The survey incorporated themes established from the interview data and asked the respondents to consider what his or her ideal communication device would look like. 43 individuals who used aided communication tools and 68 AAC professionals responded to the survey. The results from the mixed method data generated a framework of three domains that influenced preferred AAC use: device design (features of the way the device is made) wider picture (effect of different aspects of the environment), and context (the personal context of device use). The study revealed a clear indication that a well-designed and simplistic device increases the likelihood that it will be used for its intended purpose. Eighty-eight percent of users and 94% of professionals reported that the following aspects of a device were essential: getting the user's message across quickly and with minimal effort (efficiency), working well without frequent breakdowns or problems (reliability), it being set up just as the user needs it (suitability), and being adaptable as the user's needs and abilities change (adjustability) (Judge & Townend, 2013, Figure 6). Portability was also ranked as the most highly preferential feature (professionals had a mean rank of 1.7 and users a mean rank of 1.9) of how a device was made due to the ability to be able to

take the device into all relevant situations. The researchers concluded that ease of access issues resulted in either favorable or unfavorable impressions of voice output devices. Simple devices are regarded as “both an aspiration (for users who [feel] their current devices [was] not simple) and a positive experience (for users who [feel] their current devices [are] simple and easy to use)” (Judge & Townend, 2013, p. 379). Other researchers have reported similar findings. Calculator’s (2012) study of 122 parents of children with Angelman Syndrome who use AAC to communicate found that almost 32% of the respondents remarked that the ability for children to easily articulate and use the device in a functionally equivalent manner to children who do not use AAC was of primary importance (p. 564). Beukelman and Mirenda (2013) reported that aided techniques such as speech-output devices and communication books which are transportable and contain a satisfactory number of vocabulary choices hold more value because these features increase accessibility (pp. 220-221). Hershberger (2011) noted the ability to download an application (app) onto a personal device (i.e. iPad) can give the “family a greater sense of control” when “providing a voice for their child” (p.29). Functionality remains a crucial aspect to any intervention. The importance of assessment and subsequent selection of a device which is commensurate to the child’s abilities have the potential to alleviate such obstacles.

In contrast, families who report difficulty with using speech-generated electronic devices often cite the time-consuming and tedious nature of AAC programming as one of the major obstacles facing the full integration of these technologies into their everyday lives. When programming vocabulary for “just in time” and immediate use of novel

language unique to a particular situation, Light and McNaughton (2012) assert that the “inordinate time pressures experienced by parents” to add such concepts disallow for “on the fly” communication (p. 41). Clearly, the development of products which can support these needs is a crucial component for ease of access issues.

### **Voice and Language of AAC**

While ease of access concepts remain key themes for families when using AAC, it is also advantageous for professionals to consider the impact that culture and language may contribute to this discussion. Unfortunately, researchers such as Beukelman and Mirenda (2013) and McCarthy and Light (2005) acknowledge that the literature is profoundly minimal in these regards. In their synthesized data analysis of twenty-seven peer-reviewed publications which addressed barriers and facilitators to successful AAC implementation, Baxter et al. (2012) identified voice/language of the device (and communication systems which employ no-tech or low-tech methods) among the essential components of AAC. They pointed to various issues in this category, including the language of the device (or system), the difficulty of non-English-speaking family members’ ability to understand the synthetic/computerized voice output from speech generated devices, the perceived embarrassment for some young or teenage users because devices did not use their own voice, and irritation when spelled words were not correctly enunciated with devices that provide for orthographic input. Beukelman and Mirenda (2013) mirrored these concepts in their analysis of synthetic speech. There are two types of voice output: Text-to-Speech and Digitized Speech. Text-to-Speech refers to

a group of mathematic algorithms that follow speech patterns, including "...rules for pronunciation, pronunciation exceptions, voice inflections, and accents" (pp. 94). Words or sentences are either spoken directly into the device to be immediately vocalized or retrieved from coded memory. These types of devices do not store speech, but rather conveys messages which adhere to the programmed algorithm. The second type of synthetic speech is referred to as Digitized Speech. Digitalization of natural speech is produced by someone speaking directly into the machine, and then the speech input is then filtered through a converter and activated by the AAC user to aid in communication. Beukelman and Mirenda (2013) stated that a synthetic speech device has five major advantages because it:

1. May significantly reduce the communication partner's burden in the interaction because interpretation of the output requires only the ability to understand spoken language,
2. Provides information in a mode that is relatively familiar and nonthreatening to communication partners,
3. Allows communication even with communication partners who are not literate...and with those who have visual impairments,
4. Allows the person using AAC to send messages without first obtaining his or her partner's attention through some other mode and,
5. Allows communication to occur at a distance (pp. 95).

Both text-to-speech and digitized speech devices hold the potential to greatly enhance a person with complex communication needs' ability to directly participate in his or her environments. Some users report that synthesized speech helps alleviate miscommunication and promotes independence and autonomy.

Synthetic voice output also has its disadvantages. An additional component of the research by Judge and Townend (2013), as noted above in the “Ease of Use” section, remarked that individuals highly valued “personalization” as a key feature of preferred device configuration (pp. 376). Personalization, in terms of synthetic speech, can refer to any number of characteristics that are distinct for each person. Gender, age, dialect, and language are all representative of an individual’s inherent uniqueness. The subjects in the study were asked if they would change the regional accent on their device or make other voice adjustments if given the opportunity. Although 65% of the users felt they had no selection of voices to choose from, curiously the professionals in the study were the ones who rated the “range of voices” as a more sought-after feature than did primary AAC operators. One sample AAC user interviewee jokingly toyed with the idea of changing the voice to sound Scottish, to produce a more regional accent from Yorkshire, or to even sound like her support worker (Judge & Townend, 2013, p. 376, Quote 2). The banter behind this interview quotation may be more representative of a user’s *desire* to sound differently rather than his or her *necessity* to sound differently.

Current literature also recognizes the importance for augmentative and alternative communication to “provide augmented input models in the language of the community and family” when used in contexts with dual language learners and cultures (Beukelman & Mirenda, 2013, p. 11). Fahim and Nedwick (2013) stressed the importance of bilingual children having the ability to functionally communicate in either or both languages. The researchers used the case history of a three-year-old girl named Lena who is developing her language skills in English and Arabic to articulate their findings. Lena’s challenges



with receptive and expressive language stem, in part, from a diagnosis of autism spectrum disorder which makes learning functional and social language difficult for her. Fahim and Nedwick noted that Lena's verbal development may be similar to many children who grow up in a bilingual household because her family will frequently code switch, or interchange between English and Arabic, seamlessly within a single conversation. "If this is the case, then the recommendation is to use the correct word in either language as this helps the child with consistency and generalization of his or her skills across multiple settings with multiple instructors" (2013, p. 14). It is important for the individualized AAC to have the capacity to represent both languages. In Lena's case, her AAC input has been developed to pair the verbal label of an object or concept (in English and Arabic) to its corresponding American Sign Language (ASL) sign. The authors assert that combining sign language with verbal input in this context would help solidify the "connection that both words refer to the same item or action" (Fahim & Nedwick, 2013, p. 15).

Aguilar (2013) expands on the topic of the need for providing AAC input in the home language by asking questions relating to the preference of language instruction for children whose primary language is not English. The goal of the research was to determine if the identified children had a preference for the language they were instructed in (English versus the language/s spoken at home), and how this potential preference related to instructional variables for individuals with disabilities. The author conducted two studies with students identified as having both a diagnosis of autism and living in families who spoke Spanish as their primary language. The first study participant was a

six-year-old boy whose IEP indicated that he required instruction on receptively identifying body parts. He was presented with three BIGmack single-message communication devices, each with a specific switch color (blue, green, and yellow) and given a concurrent-operant chains method in which he would activate the switch that had his preferred language of instruction, receive the condition of 30 seconds of direct instruction in the chosen language, and then received a Batman toy as the final link in the chain. The first device recorded “work in English,” the second with the same instruction in Spanish, and the third with no auditory recording as a control. The results of the initial study indicated that the child preferred the language of instruction in his native language of Spanish. His choice preference remained consistent even when the switch colors were changed and reprogrammed in order to eliminate color bias.

The second follow-up study conducted by Aguilar (2013) presented an ABAB design utilized to assess the effects of task difficulty on preference for language instruction. Five students, ranging from five to ten years of age and who lived in households where Spanish was the primary language, were selected for the study. Easy and difficult tasks for each child were identified from their school IEPs and recorded onto single-message BIGmack switches with the same concurrent chain assessment method used to identify preference of language instruction as in the first study. In this study design, the task difficulty (easy or difficult) was assigned either as an A or B. The results of the second study revealed that four of the five participants showed minimal differentiation between English or Spanish when the task was simple for them; whereas, three of the five students showed preference for Spanish instruction when presented with

more challenging tasks. Both components of Aguilar's research reveal a strong correlation between the child's home language and the language of instruction. The majority of the students in the study showed more academic engagement with their home language, especially as the tasks increased in rigor. This supports the idea that making provisions for AAC strategies in the predominantly-spoken home language of the child has the potential to increase access and interest for instruction, especially in tasks that are deemed to be more difficult.

Stahl (2014) added another level of complexity to the issue of the voice and language of AAC for individuals who live in households whose primary language is not English. She identified three types of English Language Learners: those which speak languages other than English as a primary language, simultaneous bilinguals (children who are raised speaking both English and their heritage language from birth), and optional language learners (those who seek to learn multiple languages although one or more may not be spoken by family, and the student may be enrolled in a language immersion program at school) (p. 11). For the purposes of the current investigation, Stahl studied the importance of preserving bilingualism in AAC systems and bilingual opportunities (including primary language support and optional second-language immersion classes) for children with developmental disabilities through survey data collected from 42 Speech Language Pathologists. The SLP's were comprised of those who worked in British Columbia, Canada, and were solicited from multiple educational practitioner associations. The results of the study indicate that the SLP's felt they had adequate professional development regarding students with developmental disabilities,

but inadequate access to instruction regarding bilingualism. Additionally, the SLP's noted that individuals with "mild" disabilities should and do receive more support for bilingual services, while individuals with "severe" disabilities were less included in bilingual language services. The study also indicates that these professionals believe that the severity of the disability *should* have an effect on inclusion in optional second language immersion programs but *not* ELL services. The results of this study can be correlated with teaching and supporting bilingualism to populations who use AAC for communication because AAC is simply an alternative mode of linguistic input and output.

The importance of reviewing the current literature surrounding the voice and language of AAC is that it is clearly related to instruction and individual preference. Researchers have investigated various components of this need and have summarized that these aspects of AAC can enhance quality language support from professionals.

### **Family Perceptions and Support**

As discussed previously in Chapter 1 and above in "Assessing Augmentation Strategies Appropriate for the Child," the support from an AAC users' family is a vital aspect of successful AAC integration. Researchers have highlighted this importance from a variety of lenses and have underscored how families are essential to the process.

As the previously-cited studies in this literature review postulate, language outcomes can be improved by family support in home environments. Research conducted by Brady, Thiemann-Bourque, Fleming, and Matthews (2013) reflect on the advantages

of a home-school communication model and find that the children in the study displayed more progress in daily communication when input received at home was higher. Ninety-three families elected to participate and all children presented with communication deficits that were currently being augmented by various AAC strategies, including no tech and low-tech speech generated device solutions. The stated outcome variable measured the different number of words used by the children across contexts. Researchers observed the participants at school for a total of two hours across two school days and had asked the teachers to present a typical instructional day without modification due to their presence. The number of adult communication input directed solely to the study participants was recorded. Adults and children in their typical home environments were also observed for adult communication input. The same process at school and home were repeated one year later (for eighty-two of the initial participants) for comparison of the number of words used by the child to communicate. At the initial onset of the research, the authors hypothesized that explicit instruction at school and other variables would predict the number of words produced by the children after the second measurement and would outweigh adult input at home. The resulting conclusion of the study was deemed “unexpected” by the researchers, but could be explained by school instruction that was “relatively high, but with little variation” (Brady, Thiemann-Bourque, Fleming & Matthews, 2013, p. 1607). Literature seems to consistently substantiate that a language-rich and supportive home environment, similar to the current study’s findings, aids communication development for children who use AAC to

communicate (Huttenlocher et al., 1991; Hart & Risley, 1995; Fernald, Marchman, & Hurtado, 2008).

Pinto and Gardner (2014) provide an example of how families can support a child to functionally communicate using AAC. They use a single-subject multiple probe research design to investigate how the ImPAACT Program affects storybook reading for three European American mothers and their children who used AAC in comparison with three African American mothers and their children who used AAC. The ImPAACT Program was developed in 1991 by Ellis, et al. and adapted for use with AAC strategies in 2005 by Kent-Walsh and McNaughton for the purpose of teaching individuals who use AAC the conversational skill of turn-taking while conversing with a communicative partner who utilizes a least-to-most prompting hierarchy. The 2005 model included an eight-step program, beginning with a pretest and commitment from the parent to learn the strategy, and ending with a demonstration of the communication partner interaction strategy in multiple contexts. For the current study, the interaction strategy includes:

1. Read + provide an aided AAC model [least restrictive],
2. Ask a *wh*-question + provide an aided AAC model,
3. Answer the *wh*-question + provide an aided AAC model [most restrictive]" (Kent-Walsh, Binger & Hasham, 2010, p. 101).

Each mother was taught to use the technique during storybook reading with their child while using AAC. Communication boards were made for each of the three storybooks used in the study and individualized to meet both the needs of the child and their unique AAC components (including speech-generating devices and/or alternate communication

strategies.) The purpose of comparing and contrasting European-American and African American families was to determine if the culture of the family influenced the success of the interaction strategy. The researchers assert that, although all participants spoke English, African American families have been historically identified as having communication styles that differ from the middle to upper class European American participants that are represented in most language studies (Parette, Huer & Wyatt, 2002). The outcome of the study reveals a significant increase in skills for both comparative subgroups on the turn-taking interactions from the parent and child perspective. All mothers had a 0% baseline for using the cuing hierarchy and at least a 90% success rate after intervention. All six children had very low rates of communicative turn-taking during baseline (10 or fewer during a 10-minute storybook reading session) and all at least doubled (five of the six children quadrupled) the amount of turns plus the number of different concepts they were able to express during baseline. Due to the large extent of improvement, the authors conclude that all children likely had the *ability* to take symbolic turns during storybook reading (i.e. answer *wh*-questions using AAC) at the onset of the study but did not have the *opportunity* to communicate this ability. The authors found minimal differences when comparing cultural groups, which were related to the behavior of the child. They do not offer potential cultural implications of the research.

An additional component in the discussion of the potential implications of culture, home language, and family support concerning AAC use is the decision for bilingual or multilingual families to teach their child to be monolingual (in the predominant language

of society) or bilingual (in both the predominant language of society and the predominant language(s) spoken at home). The issue of bilingualism finds its origins in the Civil Rights Act of 1964 and can be traced through U.S. history in the Bilingual Education Act of 1968, The Equal Education Opportunities Act of 1974, and subsequent congressional and legal rulings, to the No Child Left Behind Act of 2001. NCLB discouraged bilingualism taught in school, in favor of English acquisition (Multilingual Mania, 2010, “Cultivating a Multilingual World”). Parents of school-age children, both typically and non-typically developing, have needed to address monolingualism versus bilingualism within the context of individual ability, the effects of this decision on family dynamics, and the importance of imparting their native culture with their child (Finsel, 2012, p. 35).

Finsel (2012) acknowledges the potential consequences of this decision within the context of individuals diagnosed with Autism Spectrum Disorder (ASD). Finsel conducted survey research which stemmed from this question and also the sometimes “conflicting advice” that families receive from professionals about this issue (pp. 3). Potential respondents were solicited from Autism Society of America chapters and other organizations related to autism and bilingualism. Individuals with autism were the targeted population of the research due to the disability having a significant effect on receptive and expressive language development. Of the thirty-two participants who responded, ten had a bilingual background and all were caregivers of an individual with autism between the ages of 2-22. The study revealed that, although parent use of either one or both languages varied, the majority reported feelings of confusion (e.g. “I hate to make things more difficult for him [b]ut would really like him to speak both”) and



hesitation (e.g. “[it] may cause confusion and [I want to] hold to wait until he can master the English language first”) (p. 37). They also encountered inconsistent advice (e.g. “Pediatrician suggest English, SLP suggest both, and some even suggest Japanese only...”) (p. 37). Interestingly, the decision by parents in the study to raise children in a monolingual environment versus a bilingual environment centered on the child’s diagnosis of Autism Spectrum Disorder. For example, whereas 30% of respondents initially spoke only their native language with their child, 0% of the same families spoke only their native language with their child after the diagnosis. Similarly, 10% of families spoke English-only prior to diagnosis and 30% of the same respondents chose to speak English-only afterward. Reported reasons for decreased use of the native language were greatly impacted following an ASD diagnosis due to, in part, the complexity of the disability in relation to language acquisition, the child’s perceived ability to learn a second language, and conflicting opinions by professional sources. The results of the study indicate that caregivers are especially sensitive to the necessity of careful deliberation regarding language and the inherent importance of professionals to use evidence-based practices to support their recommendations.

### **Summary**

In conclusion, individuals across cultures and speakers of languages other than English have both positive and negative experiences resulting from AAC use. It is vital to the field of AAC research that investigators pursue the role that these factors play in successful implementation of communication systems. A study participant in the research

from Srinivasan, Mathew, and Lloyd (2011) makes a compelling argument regarding the inherent importance of providing thorough AAC assessment and support by summarizing: “We need to understand that it is a basic human right for the child to communicate in whatever way he can, we have to provide the opportunity and then understand what he wants to communicate” (p. 238). A review of the current AAC literature affirms this assertion.

## CHAPTER THREE

### DESIGN

#### **Specific Statement of the Problem**

What strategies, which may or may not be utilized in school environments, can families employ at home to increase the likelihood that their child will learn and use their Augmentative Alternative Communication (AAC) system both at school and home? What are the support needs of English-only families and non- English-speaking families to facilitate AAC use at home? What are the similarities and differences between these two groups? Specifically, the study is intended to contribute to our understanding of the relationship between family home language and AAC use.

#### **Hypotheses To Be Tested**

At the onset of the study, it was hypothesized that the following factors influenced the use and implementation of AAC practice at home:

- Reported AAC use and the perceived value of communication between AAC user and family, regardless of home language, increases with more family input into the device selection process and instruction on the programming and use of the communication device/strategy with the child.
- Children of non-English-speaking or multilingual families' AAC integration at home are less than English-only families when professionals have not effectively

supported specific needs that may be unique to non-English-speaking and multilingual children and their families.

Additionally, the above hypotheses are affected by the availability and expectations for the child using AAC in various settings. These communicative opportunities may include, but are not limited to: requesting objects, making comments, supporting classwork and homework, casual conversation, using AAC in the community or outside of the home, etc.

### **Design**

This research study applied a sequential mixed methods research design (Mertens,2014) with the goal of obtaining correlational data, thereby relating the pragmatic paradigm to the identification of relationships in order to enable explanation of research question phenomena. Independent variables were the home language and culture and the access to AAC in the home and school. Dependent variables were identified as the student's use of AAC at home compared to school and parent reports regarding what has facilitated and/or created barriers to AAC use at home and their parents'/guardians' support needs in AAC use.

### **Recruitment Procedure**

The researcher obtained permission from both (identified school district omitted to protect anonymity) and Special Education Local Plan Area (SELPA) directors to gain primary access to families whose children are identified on their Individual Education

Plan (IEP) as using Augmentative Alternative Communication. This occurred through district personnel to protect family confidentiality. The researcher recruited participants by arranging for the Assistive Technology/AAC Specialist of the (identified school district) to send the survey with the informed consent form and cover letter through the U.S. mail to parents whose children were utilizing AAC. These students' IEPs stated that they were also receiving monitoring from the district Assistive Technology Specialist. The California State University East Bay (CSUEB) Institutional Review Board approved the Informed Consent and cover letter that accompanied the survey to solicit parent's interest in the study. The cover letter stated that the study results might assist parents and district personnel to learn strategies about how to effectively support their child's AAC use in home and school environments. Furthermore, the letter also stated that the first ten individuals who returned the survey and agreed to be interviewed would receive a \$15.00 gift card to Target as an added incentive to participate.

Respondents to the survey were asked to participate in a semi-structured interview for a more in-depth understanding of their viewpoints as expressed in the survey data. A translator was offered if desired by the family. Survey respondents had the option of participating in this portion of the research and completed the informed consent form if willing to be interviewed. Interviews were scheduled to take place in the interviewee's home or other parent-selected location, with consent.

## **Procedures**

Quantitative data from students who were identified as using AAC in (school district not identified to maintain anonymity) were obtained through survey data collection. Numerical data, which is the type of data collected by quantitative researchers (Mertens, 2015), were collected from a sample of respondents to the survey who also agreed to be interviewed with more probative questions. The qualitative data from parent interviews were analyzed to ascertain any patterns of AAC application and utilization at home across English and non-English-speaking families according to triangulation and peer debriefing research methodologies (Mertens, 2015, pp. 257-258). The researcher obtained credibility of the data by reviewing the responses to the items in the semi-structured interview questions with the identified school district Technology and AAC Specialist. Audio tape recordings of the interviews afforded the researcher and colleague the opportunity to review the interviews for agreement on common themes and patterns. Both quantitative and qualitative research components were available in English and/or in a language other than English, according to the language needs of the family.

## **Population/Sample**

The research study was conducted in the identified school district, which serves students in preschool, elementary, secondary, transition, and alternative schools/programs. According to Data Quest (Reporting Cycle, December 2013), which is affiliated with the California Department of Educational Demographics Unit, the total enrollment during the 2013-2014 school years equaled 33,887 students across 42 schools.

According to Data Quest (2013-2014), nearly 20% of the population identify as being English Language Learners (English Learner Students section). As shown in the table Special Education Enrollment by Ethnicity and Disability, the district provides special education services to 9.5% of all students (see Table 1 for district enrollment percentages). The identified school district provides special education services to students identified as having one or more of the thirteen established disability eligibility categories.

Table 1

*District Enrollment by Ethnicity*

<b>Reported Ethnicity</b>	<b>Total: General + Special Education</b>	<b>Special Education</b>	<b>Comparison Between General and Special Education</b>
African American	3%	7%	2.3%
American Indian or Alaska Native	.4%	0%	0%
Asian	55%	34%	62%
Hispanic or Latino	15.9%	30%	53%
Pacific Islander	6%	<1%	17%
White, non-Hispanic	15.1%	21%	72%
Other	3.2%	-	-
Multi	-	4%	-

*Note.* The demographics by ethnicity measures are from Data Quest, California

Department of Education Demographics Unit, 2013-2014 school years (Reporting Cycle section, December 2013). Ethnic Enrollment denoted with (-) represents non-reported data by Data Quest (District Enrollment by Ethnicity section, 2013-2014). Comparison is between the total population of student enrollment by ethnicity and the total population of student enrollment by ethnicity who receive Special Education Services.



Parents/guardians of children ages three to 22, who attended Fremont Unified and were served by the district Assistive Technology Specialist, and who qualified for AAC due to communication needs were included in the pool and contacted for the study. The families included in the research had children who had consultative and/or direct AAC services on their Individualized Education Program. In total, 87 families were sent a survey regarding their perspectives on their child's use of AAC at home. Of these families, the return rate for surveys was 15%. The agreement to participate in the interview had a return rate of 23%. The demographic characteristics of the individuals who returned the survey are shown in Table 2, including the parent participant number, age and disability category of the child, the language/s spoken at home, and if the family is non-English-speaking or multilingual. As Table 2 reflects, eight parents/guardians self-identified as non-English-speaking or bilingual.

In total, three families agreed to be interviewed; however, one survey participant could not be reached for an interview despite multiple attempts to contact them. The demographic characteristics of the individuals who participated in the interview are shown in Table 3 and include the same labels as Table 2 for comparison purposes. Of the two respondents who agreed to be interviewed and who could be reached, both self-identified as non-English-speaking or multilingual.

Table 2

*Parent/Guardian Survey Demographic Data*

Participant Code	Child's Gender	Child's Age Range	Type of Disability/ Disabilities	Languages Spoken At Home	Primary Language Spoken At Home	Non-English Speaking or Multilingual
P1	Male	15 years or older	Speech and Language, Autism, Intellectual	English	English	No
P2	Male	Under age 5	Speech and Language, Intellectual	English, Spanish	English, Spanish	Yes
P3	Female	6-9 years	Orthopedic Impairment, Other Health Impairment	English, Tamil	English, Tamil (equally)	Yes
P4	Male	10-14 years	Speech and Language, Intellectual	English, Spanish	English, Spanish	Yes
P5	Male	Under age 5	Speech and Language	English, Spanish	Spanish	Yes
P6	Female	10-14 years	Speech and Language, Autism, Specific Learning Disability	Japanese	Japanese	Yes
P7	Male	10-14 years	Intellectual, Multiple Disabilities	Pashto	Pashto	Yes
P8	Male	6-9 years	Autism	English, Some Sign Language	English	Yes
P9	Female	15 years or older	Autism, Intellectual	English	English	No
P10	Male	10-14 years	Speech and Language Intellectual	English	English	No
P11	Female	6-9 years	Autism, Intellectual	English, Spanish	Spanish	Yes
P12	Male	6-9 years	Other Health Impairment Multiple Disabilities	English, Chinese	English, Mandarin	Yes
P13	Male	6-9 years	Speech and Language, Autism	English, Spanish	English	Yes

Table 3

*Parent/Guardian Interview Demographic Data*

Participant Code*	Child's Gender	Child's Age	Category of Disability/disabilities	Languages Spoken at Home	Primary Language Spoken at Home	Non-English-speaking or multilingual?
P3	Female	6-9 years old	Orthopedic Impairment, Other Health Impairment	English, Tamil	English, Tamil (Equally)	Yes
P6	Female	10-14 years old	Speech and Language, Autism, Specific Learning Disability	Japanese	Japanese	Yes

*Note.* Participant code is based upon the established participant code in Table 2

### **Instrumentation**

After a review of the current peer-reviewed literature in Augmentative and Alternative Communication, a survey was created to collect information on viewpoints of the respondent in the district whose children use AAC to communicate. Twenty-eight questions were included on the survey, covering a wide range of topics related to the established research questions (see Appendix A for source document). The survey was also translated into Spanish using a decentering methodology, which involves a translation of the document into another language based upon the concepts contained in the questions and is not primarily based upon a literal translation (Mertens, 2015). The translation was provided by a translator affiliated with the identified school district, who was knowledgeable about the educational processes for students with disabilities. As

advocated by Mertens (2015), the researcher and translator discussed each survey question extensively to form questions that were comparable in both the source document and translated document (p.192).

The first four questions of the survey addressed demographic information about the student's gender, age, and category of the student's disability. The primary language spoken at home was also requested. The next six questions asked about the communication strategies employed by the students, including low-tech and high-tech voice output devices, pictures, icons, gestures, sign language, etc., along with who had made the referral for AAC assessment and possible services. A question regarding the method of vocabulary selection and the mode in which the student accessed their AAC strategy (e.g. fingers or hand, eye gaze, scanning, etc.) was also included in this category of inquiry. The next five questions related to where the student used AAC and with whom. The types of training in AAC use that had been provided to the parent/guardian comprised the next five questions. One of these questions utilized a five-point Likert scale (1= not beneficial; 5= very beneficial) related to how beneficial the family perceived different types of AAC trainings to be. Three questions were then asked regarding any potential barriers to using AAC at home, including difficulties and limitations of using the strategies established in their student's IEP, such as programing speech-generated devices, a lack of practicality, and the inability for the child to effectively use the AAC strategies. A five-point Likert scale (1= don't agree; 5= completely agree) was utilized for parents to rate how strongly they agreed or disagreed with common misconceptions related to AAC. The next four questions requested survey

participants to rate how valued they felt in the IEP team decision process for their child to utilize AAC strategies and whether or not they experienced input into the type of AAC used with their child. One question about how well families perceived professionals' (i.e. teachers, specialists, independent contractors, etc.) knowledge about supporting family usage at home was also posed. Finally, survey respondents were encouraged to share any additional information that was not addressed by the survey questions about their child's practice of AAC strategies at home. Questions throughout the survey also provided opportunities to respond as "other" if a parent/guardian's desired response was not specifically included as an answer in the given question. Contact information was requested at the end of the survey, in conjunction with Informed Consent, if the survey participant chose to be involved in the qualitative interview component of the research.

### **Analysis of Completed Questionnaires**

The two questions on the parent/guardian surveys, which were rated on the Likert Scale, were compared using an unpaired, two sample t-test for each question. This analysis looked at the mean response for parents/guardians, ascertaining whether or not the p-value showed any statistical variances. Statistical p-values that indicated dissimilarities were further evaluated using the Chi square method of statistical analysis. The student demographic data provided by the parent/guardian who completed the survey were analyzed and the mean responses computed. Participant responses were coded (e.g. P1 represents Participant number 1, P2 represents Participant number 2, etc.). The

quantitative data acquired in the last open-ended survey question and also questions that included an “other” response were documented and written by question.

### **Analysis of Completed Interviews**

The data comprising the qualitative portion of the research were derived from a semi-structured interview format, which is used to elicit a more relaxed environment for the interviewee and to obtain more in-depth information. Twenty-four interview questions along with three possible clarification questions were prepared prior to the start of the study and approved by the CSUEB Institutional Review Board (see Appendix C for interview questions). Of the parents who agreed to be interviewed, 0% requested a translator. An explanation of the common acronyms to be used during the interview (e.g. AAC, IEP, and Picture Exchange Communication System-PECS) was provided at the onset of the interview in order to establish commonality in vocabulary usage. Rapport was also generated by reviewing the purpose of the interview (a follow-up to the completed survey regarding AAC use at home and to gather more specific information regarding the family’s individual experience of using AAC in home environments), stating my credentials (Clear Multiple Subject with Supplemental English Composition credentials, Level 1 Moderate-Severe Education Specialist credential, Candidate for Master of Science Degree in Special Education, and a teacher of students who have moderate-severe disabilities for seven years at both the high school and elementary levels), and providing assurance of confidentiality. Parents/guardians were also asked to sign Informed Consent document and were asked permission to tape interview for

research purposes only. The interviews were hypothesized to last 30-45 minutes and were scheduled to be held in a convenience location in order to maximize comfort for the respondent. The interview participant data were coded and analyzed for thematic content.

## CHAPTER FOUR

### RESULTS

#### Survey Data

A total of 87 surveys were mailed to the parents/guardians of students identified for the study according to the Recruitment Procedures outlined in Chapter Three (refer to Table 2 for demographic data). The surveys were evaluated for family characteristics by language/s spoken at home and were grouped accordingly. Additionally, the primary home language, that is, the language the family uses the most, was also recorded. Of these returned surveys, 23% were categorized as English-only speakers and 77% as non-English-speakers or multilingual (see Table 4, for languages spoken at home as a percentage of the sample). Also noted in Table 4 is the percentage of multilingual families who also speak English in addition to another language. In all, survey participants represented seven different languages spoken at home.



Table 4

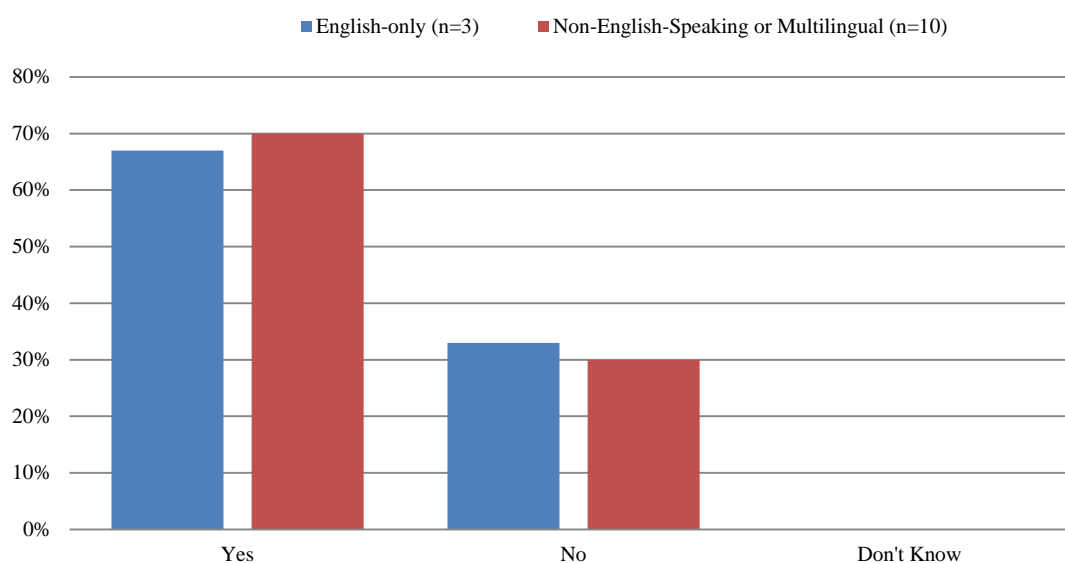
*Self-Identified Family Characteristics by Language/s Spoken at Home*

<b>Characteristic</b>	<i>n</i> =13
All Languages	
	85
Spanish	38
Tamil	8
Pashto	8
Sign Language	8
Chinese/Mandarin	8
Japanese	8
Multiple	62
Includes English	100
Does not include English	0
Primary Language	
English	69
Spanish	31
Tamil	8
Pashto	8
Sign Language	0
Chinese/Mandarin	8
Japanese	8
Multiple	46
Includes English	67
Does not include English	33

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*Note.* Data on families who self-identified that they speak multiple languages at home is divided between the numbers of families who speak English in this category ( $n=8$ ). Data on families who self-identified that they speak multiple primary languages at home is divided between the numbers of families who speak English in this category ( $n=7$ ).

Questions five and six of the survey asked if their student uses Augmentative Alternative Communication at home. If yes, the parent/guardian was asked to list what their child uses. As shown in Figure 1, participants in both the English-only and non-English or multilingual groups had similar responses to these questions; more children in the study used AAC at home than not. Individuals that responded in the affirmative that their child does use AAC at home further replied that they use a range of strategies at home to communicate with their child. “No-tech” approaches included vocalizations, sign language, facial expressions, pictures and communication books, gestures, and whole body-proxemics). “Low-tech” solutions included simple voice output devices such as the GoTalk, iTalk, and Step. “High-tech” speech generating devices comprised of the Eco2 with Ecopoint and an iPad Mini, and iPad 2.



*Figure 1. Comparison Between Users of AAC at Home*

Survey participants were then asked to identify all types of communication that their child used across all environments (i.e. home, school, community, etc.) in question seven. The researcher provided a list of potential AAC strategies to be checked off and also provided an opportunity for the respondents to fill in additional responses if needed. The given strategies included: sign language, pictures/photographs, icons/symbols, facial expressions, gestures, writing, communication/choice boards, low-tech voice output devices, iPad/iPod Touch/other tablet, computer with voice reader/text-to-speech software, head wand or mouth stick, high-tech voice output device, or something else.

When examining the results of this question, it was found that more English-only families employed “no-tech” or “low-tech” strategies than their counterpart group (see Figure 2, Types of Communication). All of these families indicated that their children used pictures/photographs, facial expressions, and gestures to communicate. Non-English speaking or multilingual families utilized a varied range of strategies which incorporated “no-tech,” “low-tech,” and “high-tech.” Two respondents from this group marked “something else” on the surveys. The first parent/guardian indicated that they also used picture books with their child. The same individual also checked “pictures/photographs” as a mode of communication for their child; it seems from the response that this particular parent considers these to be two separate forms of AAC. Other families from both the English-only and non-English or multilingual groups who also checked “pictures/photographs” but did not specify using them in a book format may have considered picture books to be a component of this communication type. The second parent/guardian that marked “something else” commented that their child does not need

AAC because “[h]e speaks only for food not about other things because he has CP [Cerebral Palsy]”.

In addition to the types of communication strategies utilized by their child, parents were also asked to provide information regarding access methods, or how their child used their AAC (see Figure 3). The primary access method across both groups was using fingers or hands (68.5%) to either touch a tangible AAC system or to gestures/sign language. No one in either group indicated that their child used other body parts (besides fingers, hands, head, or jaw), scanning, or pressing the button or picture to operate the AAC. Additionally, no one stated that the AAC system was attached to their child’s wheelchair (if applicable).

Parents/guardians were asked to rate their perceptions of how well their child knows how to use their AAC (see Figure 4). Possible responses ranged from “Not at all” to “Very well.” A “don’t know” option was also provided. The English-only group ranked “not very well” as the most common response (67%), while the non-English-speaking or multilingual group predominantly ranked “well” as the most common response (50%). One respondent in the English-only group wrote in “other- not applicable” as their answer.

Both groups were also asked about the referral or recommendation process for AAC (see Figure 5). English-only and non-English or multilingual families were consistent with their responses as a percentage of the sample. Parents/guardians for both groups requested AAC services at an average rate of 31.5% and the child’s school made the recommendation at an average rate of 36.5%. Respondents also had an opportunity to

write in “someone else” if neither the school nor parent made the referral. Early Intervention Preschool (IEP), a pediatrician, a case manager from Regional Center, and an outside therapist were recorded under this response. One participant marked “N/A” and another marked “No idea about school” in response to this question.

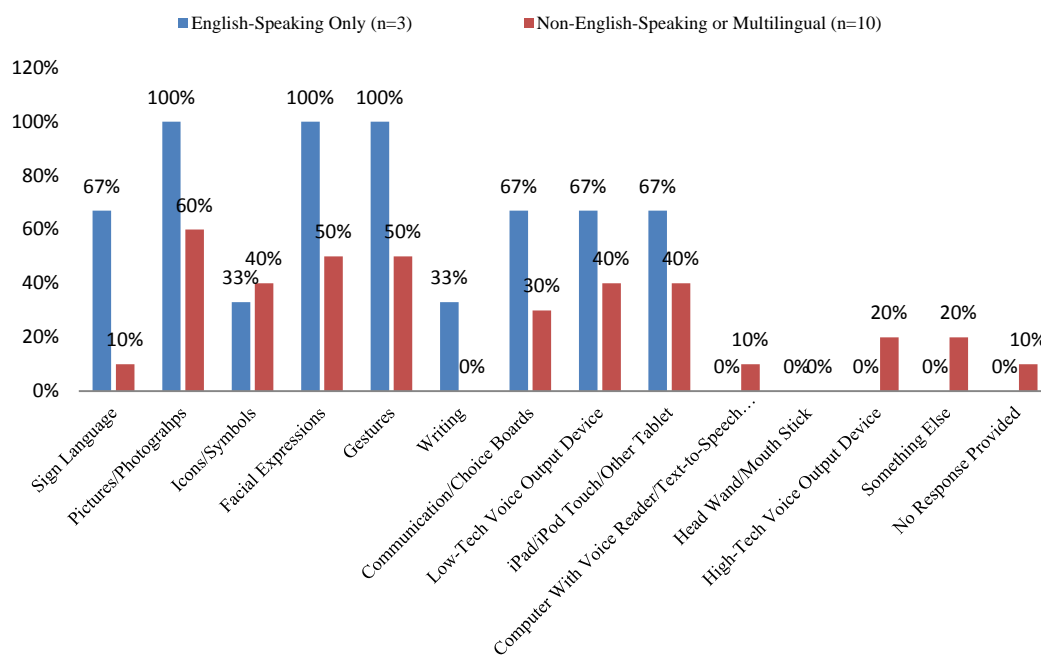


Figure 2. Types of Communication (n=13)

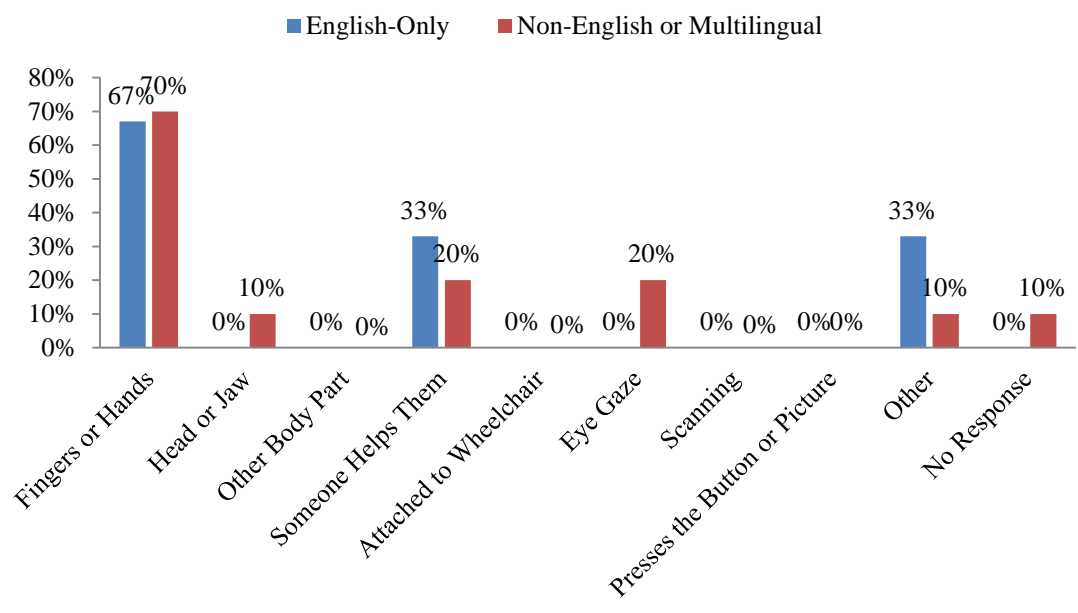


Figure 3. AAC Access Methods

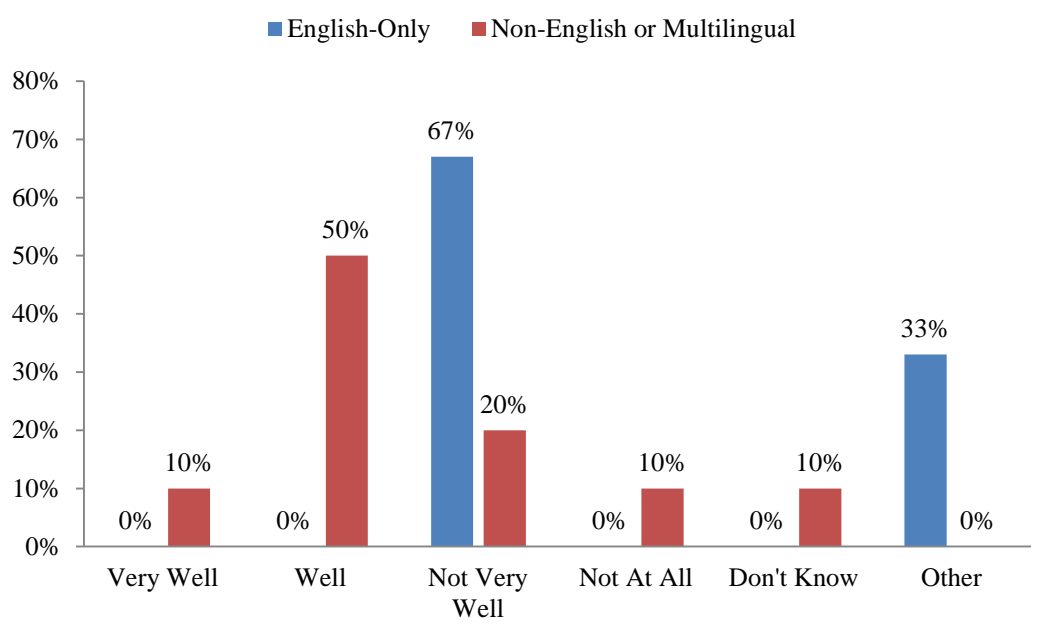
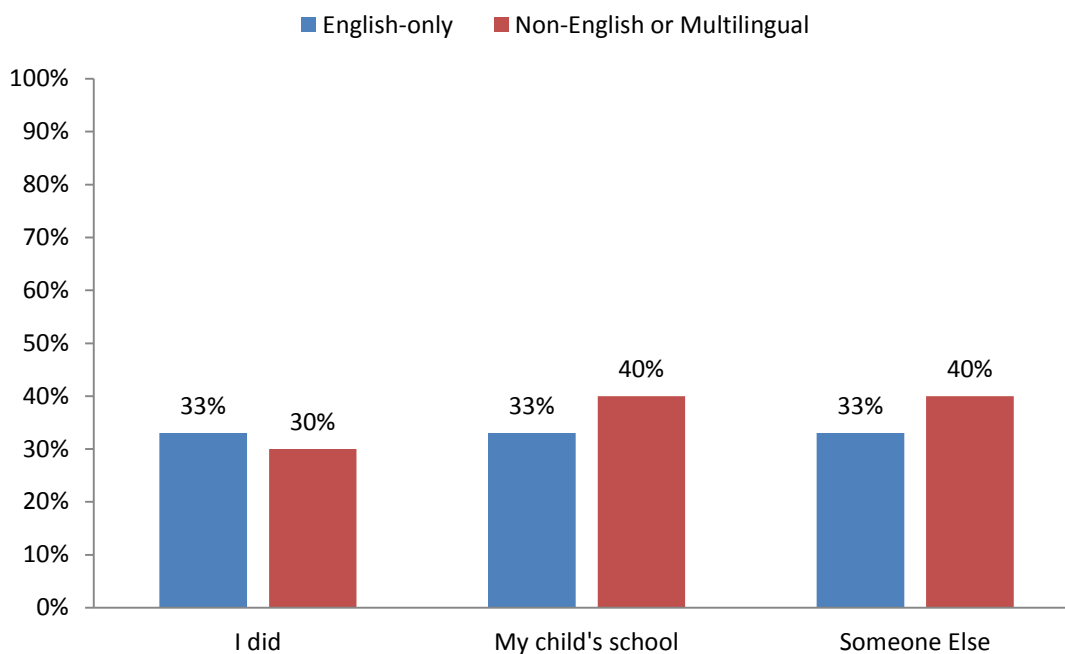


Figure 4. Parent Perception of How Well Their Child Knows How to Use Their AAC



*Figure 5. Who Made the Referral for AAC?*

Survey questions inquired about the children's use of AAC at school and the type of training they had received to learn their AAC system. English-only and non-English or multilingual families had comparable affirmative responses (67% and 70%, respectively) that their child has had instruction in this area. Although there were no families who indicated that their child did not use AAC at school, 30% of non-English-speaking or multilingual families stated that they did not know the answer the question. Nevertheless, the same families who indicated that they were unsure if their child used AAC at school also indicated that either a teacher or someone at school instructs their child on AAC strategies. This suggests a potential discrepancy in the responses, which will be further discussed in Chapter Five.

A checklist of potential types of training and possible individuals who provided training opportunities was given for parents/guardians to mark if they affirmed that their child utilizes AAC at school (see Figure 6). One hundred percent of English-only families ( $n=2$ ) indicated that their child received training at school by their teacher. Non-English-speaking or multilingual participants ( $n=9$ ) also marked their child's teacher (78%) as the person who most frequently provided AAC instruction. One individual in this group also stated that the district Assistive Technology Specialist (name omitted to maintain anonymity) also trained their child. Additionally, two surveys (one from each group) were not included in the sample because their responses were incongruent with the question. All participants who accurately responded to the question indicated that their child has received training in AAC.

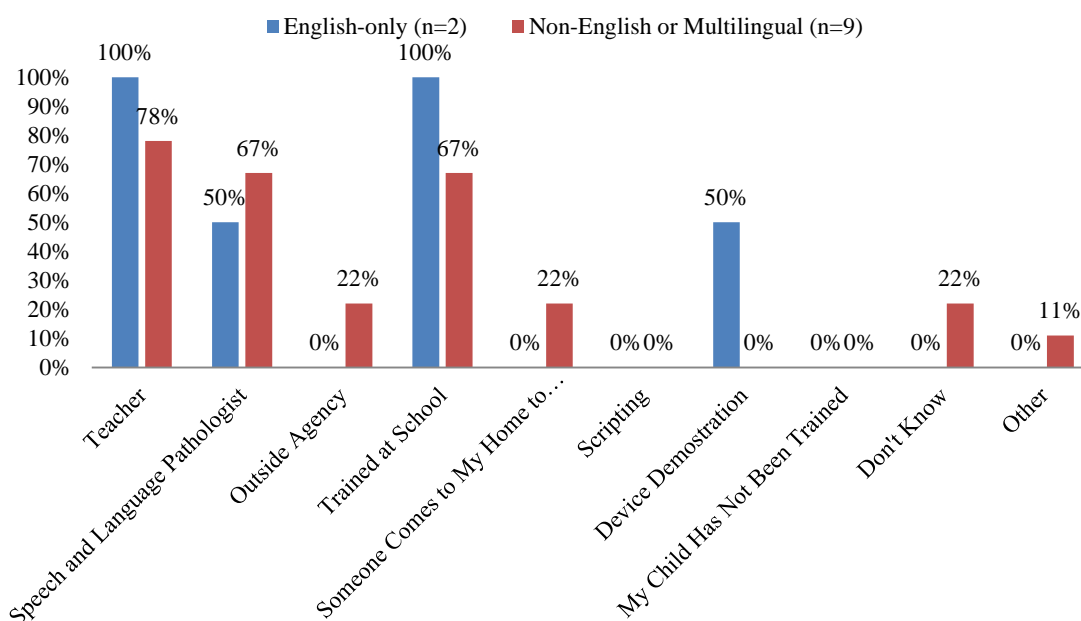
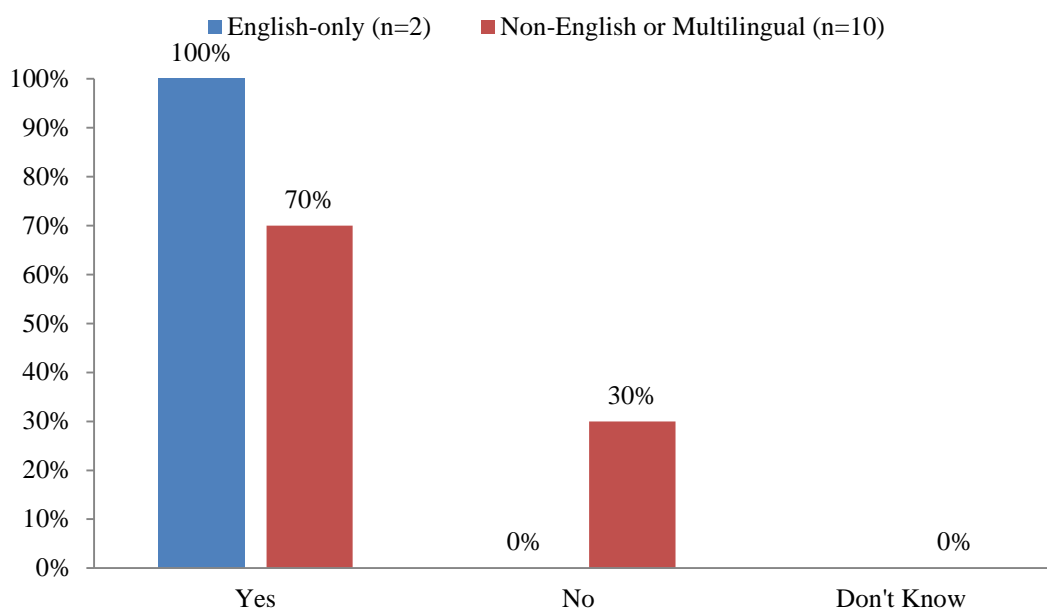


Figure 6. Types of AAC Training Received by Students



The next group of questions pertained to parent/guardian training on AAC. One hundred percent of English-only families ( $n=2$ ) affirmed that they had been offered training. One response in this group was not included in the sample size because they did not answer the question (see Figure 7). Seventy percent of non-English or multilingual respondents confirmed that they were offered training. The individuals from both groups who self-identified that they were offered training to use AAC with their child ( $n=9$ ) indicated that they received instruction from the following sources: child’s speech and language teacher; someone from an outside agency; AAC implementation workshops, conferences or seminars; device specific training from the company; online (website/source not identified); child’s classroom teacher; reading books, articles, or other literature. One respondent indicated that she “took two courses for AAC and teaching for AAC students” at San Francisco State University.



*Figure 7.* Has Someone Offered to Train You How to Use AAC With Your Child?

Parents/guardians were then asked to rate their perception of how beneficial certain types of AAC training would be useful for them. Options included: training from a teacher; training from an outside agency; books, articles, or other literature; instructional videos, specific training on the device from the company; AAC conferences, workshops, or seminars; or something else (please specify). A Likert Scale was presented for this response. This type of survey format is used to signify a person's attitude about the subject (Oxford Dictionary, 2015, "Likert Scale", para. 1). Respondents were given a scale from 1 to 5, where 1= Not beneficial and 5= Very beneficial (see Table 5). When comparing the responses from English-only families and families who were non-English-speaking or multilingual, it was determined that by conventional criteria (Mertens, 2010) the differences found are not statistically significant. This means that the variances in the data were coincidental. The highest mean (average) response from both the English-only group and the non-English-speaking or multilingual group was that training from a teacher was the most beneficial (M= 5.00). Only one non-English or multilingual respondent entered a "something else" response. This individual rated "class" as being very beneficial as a training option.

When asked if families were members of any organizations that provided support for families, Augmentative Alternative Communication learners, or individuals with disabilities, only one respondent from the English-only group indicated that they also belonged to the Parent- Teacher Association (PTA) at their child's school site. Two individuals in the non-English or multilingual group indicated that they belong to the following support groups: Autism Speaks; and CAL-TASH, The Bridge School,

American Speech and Hearing Association (ASHA), PTA, PrAACtical AAC, and Minspeak.

Table 5

**Beneficial Types of AAC Training: Comparison of English-only and Non-English or Multilingual****Responses**

Type	<i>n</i>	Mean	SD	p-value
From a Teacher				
English-only	2	5.00	0	
Non-English or Multi	9	5.00	0	
				*
From an outside agency				
English-only	2	2.50	0.707	
Non-English or Multi	9	4.33	1.414	
				0.1130
Books, articles, other literature				
English-only	2	2.00	0	
Non-English or Multi	9	3.22	1.787	
				0.3747
Instructional Video				
English-only	2	2.00	0	
Non-English or Multi	9	3.56	1.509	
				0.6245
Specific to device from the company				
English-only	2	3.00	0	
Non-English or Multi	8	3.62	1.506	
				0.5901
Conferences, workshops, seminars				
English-only	2	2.00	0	
Non-English or Multi	9	4.00	1.323	
				0.0667
Something else				
English-only	--	--	--	
Non-English or Multi	1	5.00	0	
				*

*Note.* *n* values calculated by the number of respondents per item. Values denoted by (-) indicate no response given by the entire subgroup. Values denoted by \* indicate the inability to statistically analyze data. By conventional criteria, the differences found are considered to be not statistically significant.

When asked what prevents families from using AAC more at home, respondents were provided with a list of potential answers. The highest percentage (100%) of English-only respondents considered a lack of practicality to be the most impeding factor with AAC. The highest percentage (44%) of the Non-English or multilingual group considered a lack of need as the most influencing reason. These individuals noted that they know what their child is communicating therefore AAC is not needed. Practicality was the second highest reason for this group (33%). Additionally, one respondent said that “[her] son expresses himself more each day, and it is already not as useful as before.”

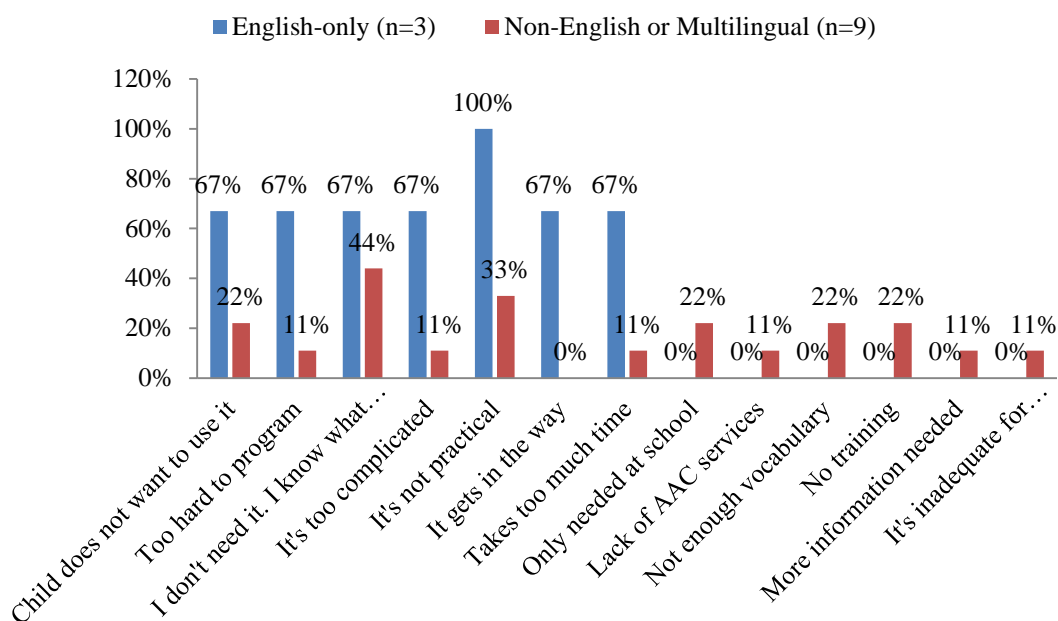


Figure 8. Top Reasons Families Choose Not to Use AAC at Home

Table 6 addresses common myths and perceptions that some individuals might have about AAC. A list of ten falsehoods were to be ranked on a Likert Scale with 1= Do not agree and 5= Completely agree. Using a two-tailed p value (a calculation of statistical difference of the mean) between the two groups, it was found that the following myths were not statistically significant: AAC will keep someone from talking; AAC is not medically necessary; mastery of low-tech AAC is necessary before learning a more sophisticated system; AAC is a “last resort”; some speech means that AAC is not needed; someone can be too cognitively impaired to use AAC; AAC will fix communication difficulties; AAC is the responsibility of the speech and language specialist; and the ability to express basic needs and wants means AAC is not needed. One non-English-speaking or multilingual respondent backed up his or her responses by stating “[AAC] *helps* with communication difficulties” and in addition to AAC being the responsibility of the speech and language specialist, it is “also [the responsibility] of others to follow through.”

One myth was found to be extremely statistically significant across groups: a child can be too young for AAC. Using a Chi Square analysis (Mertens, 2010) to test the statistical independence of the data, it was found that this result is statistically significant. English-only respondents believe that a child *can* be too young for AAC, whereas non-English or multilingual families consider that a child *cannot* be too young for AAC (see Table 7).

Table 6

**AAC Myths and Perceptions: Comparison of English-only and Non-English or Multilingual Responses**

Statement	<i>n</i>	Mean	SD	p-value
AAC will keep someone from talking				
English-only	3	1.33		0.58
Non-English or Multi	9	2.11		1.45
				0.3971*
AAC is not medically necessary				
English-only	2	2.50		2.12
Non-English or Multi	9	2.22		1.39
				0.8153*
Mastery of low-tech AAC is necessary before learning a more sophisticated system				
English-only	3	4.00		1.0
Non-English or Multi	9	3.44		1.67
				0.6019*
AAC is a "last resort"				
English-only	3	3.67		0.58
Non-English or Multi	9	2.33		1.66
				0.2119*
Some speech means that AAC is not needed				
English-only	3	1.33		0.58
Non-English or Multi	9	1.78		0.83
				0.4108*
Someone can be too cognitively impaired to use AAC				
English-only	3	4.00		0
Non-English or Multi	9	2.33		1.73
				0.1365*
AAC will fix communication difficulties				
English-only	3	3.33		1.16
Non-English or Multi	9	3.22		1.56
				0.9139*
AAC is the responsibility of the speech and language specialist				
English-only	3	3.67		0.58
Non-English or Multi	9	2.89		1.54
				0.4234*
A child can be too young for AAC				
English-only	3	4.00		0
Non-English or Multi	9	1.56		0.88
				0.0009 <sup>a</sup>
Ability to express basic needs and wants means AAC is not needed				
English-only	3	3.33		2.08
Non-English or Multi	9	1.89		1.17
				0.1539*

*Note.* *n* values calculated by the number of respondents per item. Values denoted with \*

indicate: By conventional criteria, the differences found are considered to be not

statistically significant. Values denoted with <sup>a</sup> indicate: By conventional criteria, the

differences found are considered to be extremely statistically significant.

Table 7

*Chi Square Data Analysis for Question 22: Statistical Difference: A child can be too young for AAC*

	<3	>3	Total
English-only	0	3	3
Non-English or Multilingual	7	2	9
Total	7	5	12

H<sub>0</sub>: No statistically significant difference for this item between English-only and Non-English or multilingual families regarding perceptions that a child can be too young for AAC.

H<sub>a</sub>: There is a statistically significant difference for this item between English-only and non-English or multilingual families regarding perceptions that a child can be too young for AAC.

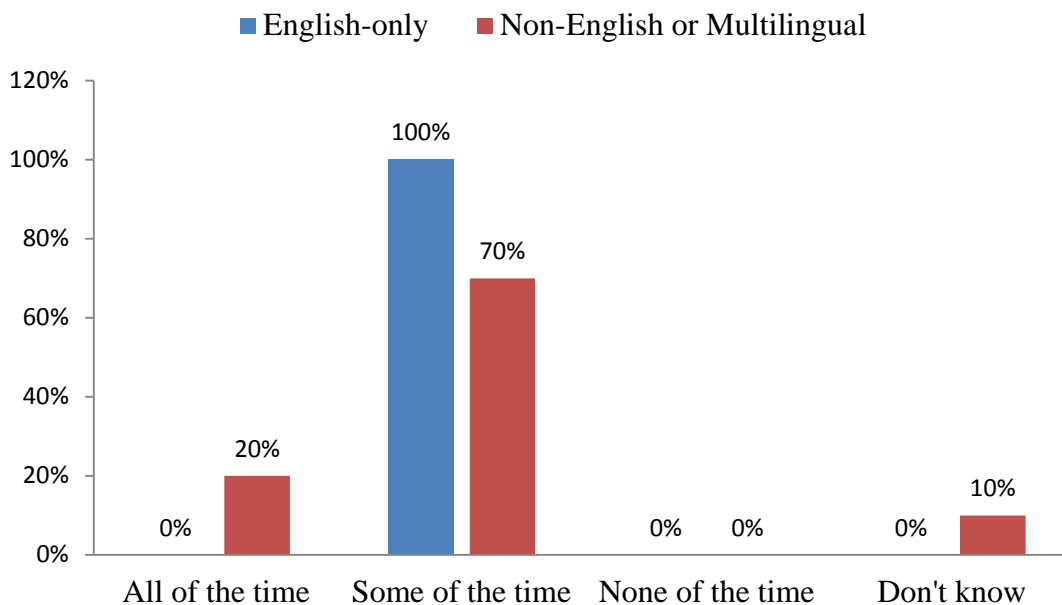
The Chi-square statistic is 5.6. The P value is 0.01796. This result is significant at  $p < 0.05$ . This means that we reject H<sub>0</sub> and accept H<sub>a</sub> that English-only and non-English or multilingual families have a statistically significant difference in viewpoint regarding the age at which AAC is appropriate for a child.



When asked if parents perceived that they were able to understand their child without the use of AAC, both groups responded “some of the time” as the most selected answers (see Figure 8). Only 20% of the non-English or multilingual group marked “all of the time” and 10% marked “don’t know”. Both groups were asked to evaluate if they perceived to have input into the type of AAC their child uses (see Figure 9). Two recordable responses from the English-only group indicated that they did not know if they had any input into the decision-making process. One respondent from this group declined to answer. By contrast, one-fifth of the non-English or multilingual group felt that they did not know if they had input. Furthermore, this group was equally divided between “yes,” they had input and “no” they did not have input. As a follow-up to this inquiry, survey respondents were then asked if they felt like a valued member of the team that decides on the type of AAC their child uses (see Figure 10). The English-only group was equally divided between “yes” and “don’t know” while the non-English or multilingual group had responses in all three categories. However, more respondents in this group felt that they do feel like a valued member of their child’s team.

Respondents were asked to rate if they felt that the professionals who work with their child are knowledgeable about how to support their family’s use of AAC at home (see Figure 11). The majority of respondents from both groups perceived professionals to be knowledgeable about family support needs. One non-English or multilingual individual additionally remarked “knowledgeable- yes, but it does not translate to provision of services with context of home or cross school-home needs.” They did not specify the reasoning behind their statement.

A question was also posed regarding the language that their child's AAC strategies use. All English-only group members had systems that speak English. Of the eight non-English or multilingual respondents who answered this question, six had systems in English even though the family speaks a language other than English. Two children had systems that are set up for English and the family's home language/s.



*Figure 9.* Perceived Ability for Parents to Understand Their Child Without the Use of AAC

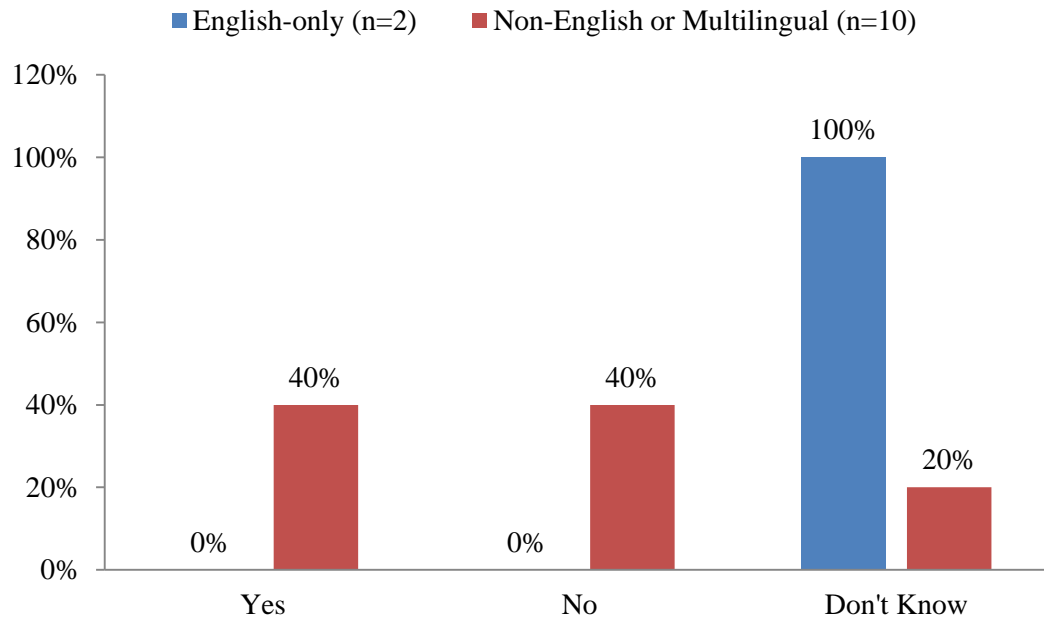


Figure 10. Parent Input Into the Type of AAC

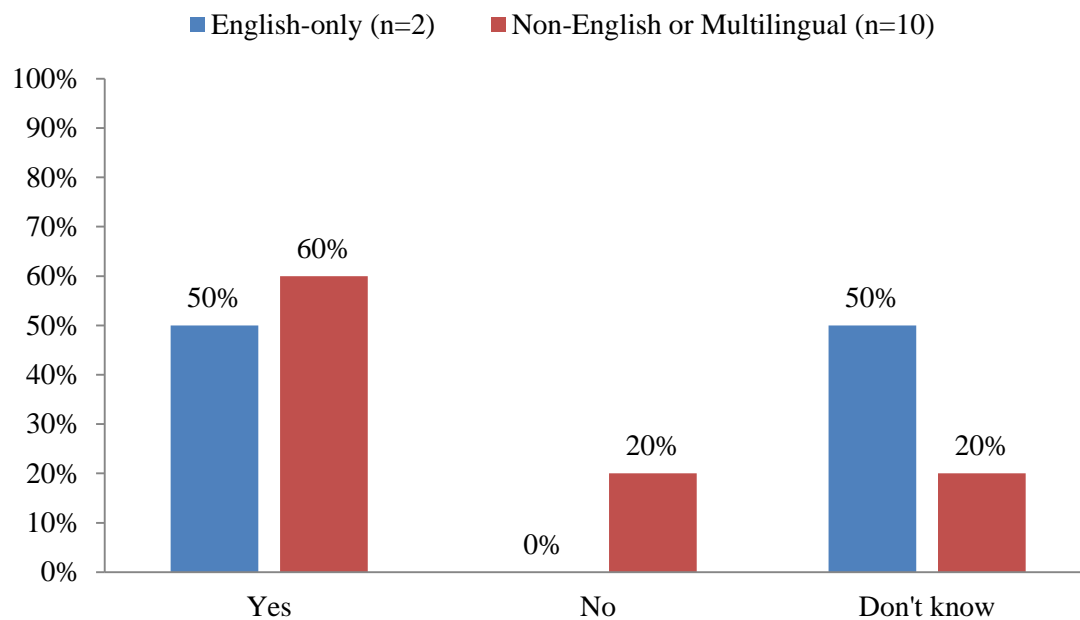
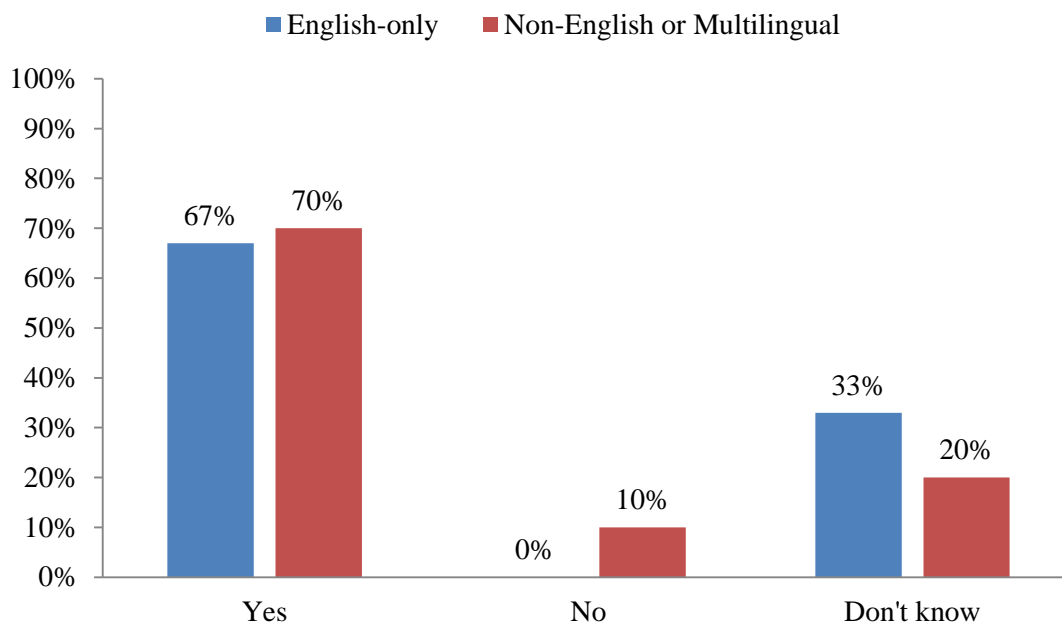


Figure 11. Do You Feel Like a Valued Member of the Team?



*Figure 12. Do You Feel That Professionals Are Knowledgeable About How to Support Your Family's Use of AAC at Home With Your Child?*

The final question in the survey was an open-ended question intended for respondents to share any additional comments about their child's use of AAC at home.

Non-English or Multilingual families added:

- AAC use at home (or school) requires lots of opportunities to model and practice and is a huge commitment from everyone in the child's life. I have felt that the core is to believe that the child has something to say and provide all that is needed to help their child speak their own mind.
- My child develops her speaking area. She became to be mild. Because I thought we understood her feelings. Thank you [teacher's name omitted to provide anonymity]!
- Do not have enough time to work with.
- As I told before that my child can speak about the food and not about the other things because of Cerebral Palsy.

- I've liked the pictures.
- [I] would request more information from his program.

English-only families added:

- We previously had an AAC device but it was so complicated we chose to return it (HP Device) but the iPod and its apps were more helpful. But we purchased a tablet for use at home, due to restrictions on the iPod. They [the school district] wanted our personal data on the iPod in case of accidental app purchase and it was easier to have a tablet that was personal property. If something goes wrong we don't have to wait for district approval to fix our own device. But I believe the devices can be helpful if user friendly and all understand how to use the device.
- She uses it when she's mad.

### **Interview Data**

Interviews were conducted for the qualitative component of the sequential mixed methods research. The data were analyzed for thematic elements in consideration of factors that influenced Augmentative Alternative Communication use among families who were non-English-speaking/multilingual or who primarily spoke English. However, since the researcher was unable to secure interviews with individuals who only spoke English, the thematic elements discovered in the interviews represent an analysis of families who stated that they spoke a language other than English. As stated in Chapter Three, the data from the interviews were triangulated and peer debriefed by the Fremont Unified Assistive Technology Specialist in order to establish credibility with the results. The interview results were coded according to common categories and questions.

The first interviewee (the mother) allowed the researcher to audiotape the interview so that the conversation could be transcribed verbatim. This participant self-identified as speaking English and Tamil as the family's home language on the survey but was very comfortable speaking English in the interview and therefore did not require translation. The second interviewees (the mother and father) did not consent for the researcher to record the interview so the researcher manually recorded each response. This family self-identified as speaking Japanese as the family's primary language. A translator was offered but declined, as the father stated that he was able to speak English well enough to provide translation for his wife.

### **Interview Data Themes**

After coding and analyzing the interview data, the researcher determined that common themes emerged that contributed to the overall understanding of the needs of non-English-speaking or multilingual families. Due to a limited number of interview participants, none of whom were English-only families, the information derived from the interviews is unable to be compared across these two groups under these conditions. Nevertheless, the interviews that were conducted still brought up principles that are important for educators to recognize. These themes were reviewed and confirmed with the peer contributor. Coding the responses occurred throughout the interview analysis and included the following categories:

- 1) The ability of the AAC strategies to reflect home language support needs
- 2) Parent expectations/perceptions of AAC

- 3) Parent expectations/perceptions for professionals working with their child in the area of AAC
- 4) Training needs
- 5) Perceived value and support from team members

## **Participants**

As provided in Table 2, interview participants were identified by the participant code (as established in Table 1), child's gender, child's age, category of disability/disabilities, language/s spoken at home, and whether or not the family speaks English or a non-English language. The interviewees provided additional information about their child that was not included in the survey data.

Participant Three reported about her daughter, whom she described in great detail. Her daughter loves exploring different types of music styles, dance, and jumping on the trampoline. She is "very outdoorsy" and enjoys waterfalls, car drives to national parks, and going to the beach. She is fully included in a second-grade general education class and has a lot of friends in class and in the community. Her daughter also receives Specialized Academic Instruction for part of the school day as needed for when she gets very tired from medical conditions and needs downtime to recuperate. She has a dedicated paraprofessional in class to support motor, feeding, and provide established academic accommodations and modifications.

Participant Six was a mother and father who reported about their daughter. They were also able to describe their daughter's hobbies and interests. She likes "anything Hello Kitty", coloring, trampoline, Disney movies, playing games and watching

YouTube videos on the iPad, and dancing to any kind of music. The family goes home to Japan every summer and she enjoys playing with her cousins while visiting. The daughter is a fifth-grade student in a special education class for students with moderate-severe disabilities and is mainstreamed in P.E., grade-level science with the support of a paraeducator for established academic modifications and accommodations, and recess and lunchtime activities.

### **AAC and Home Language**

Participant Three informed the researcher that her daughter began using low-tech AAC strategies at the age of three, which included switches and Talking Books located in the different areas of the house. She began using a Vanguard (high-tech communication device) at the age of three years six months, but required an alternative device to adapt for her deteriorating motor control. She acquired the Eco2 with EcoPoint at the age of four years nine months, which is a high-tech voice output device and is activated by scanning and selecting words and pictures through eye gaze technology. P3 reported that she uses it at home and school but not in the community because it is too large and cumbersome to take out. The family uses an iPad when they go outside. Due to motor control challenges, the daughter is unable to use the iPad independently; it is used more for partner-assisted scanning and both mother and father act as communication partners to facilitate their daughter's communicative interactions. According to mom, her daughter has "always been a multi-modal communicator" so she is okay with leaving the larger device at home



and relying more on body language and partner-assisted communication to have a conversation and make comments. For example:

“She will use her body and her eyes...an eyebrow raise to concur or turn her face away to disagree. And if we come close to something of interest then [she gives] a swat of her hand to make a choice at the store... Her friends know how to ask her choices of what she wants by offering her two hands to say ‘do you want to go on the bridge or on the slide?’ and those kinds of things. So they know how to look for her responses. And then sometimes at school she has also a Flip Book...one to carry to recess or P.E. so she can have a conversation when her device cannot be taken” (P3, personal communication, May 31, 2015).

The Eco2 operates with Unity, which has core vocabulary. Social language and phrases she regularly uses are also programmed in the device and is updated on a regular basis with pictures she can share with others about activities that she participates in.

Participant Three speaks Tamil and English equally at home. Her daughter’s device is programmed in English, but she can receptively respond to a question in Tamil. When asked if P3 would prefer the device to speak fully or partially in Tamil, she said that it did not matter to her because she is more focused on overall communication.

P3 was asked to describe her family culture within the context of daily activities and special events. The family listens to south Indian music at home in the morning to calm the daughter before leaving for school or other activities. They engage in physical activity daily and go to birthday parties and other fun activities on the weekend. P3’s extended family has learned to engage with her daughter through explicit and implicit means. They watch what the parents do and then ask questions and imitate what they have observed. Her nephew saw the daughter using Talking Books and commented about how well she understood and communicated.

Participant Six's daughter has been using a GoTalk 4+ (a low-tech voice output device that has picture overlays which can be pre-programmed and changed for different topics) at home for one year. She uses multiple forms of communication at school, including switches, GoTalk 9+, the GoTalk Now application on an iPad, some sign language, communication boards, and text-to-speech functions on the computer. She uses AAC at school to make choices, requests, complete assignments, and to engage in conversations. At home, she is able to give her feelings, make choices, and ask for desired objects.

P6's family speaks only Japanese at home and the daughter learns English at school. Without AAC at home, the daughter will point, grab, kick, throw objects, or cry to communicate her wants and needs. She will also say "no!" and make vocalizations to protest. The GoTalk is programmed mostly in English. All of the pictures are paired with English words and the dad records each picture overlay mostly in English. It is recorded in Japanese when neither of the parents knows the English word for the picture. When asked if they preferred the pictures to be paired with Japanese writing or to record all of the pictures in Japanese, P6 asked, "Can they make Japanese GoTalk?" (P6, personal communication, May 30, 2015).

The researcher inquired about P6's family culture and was told that they have "traditional Japanese values" about hard work and learning. They do not have a large support system in the United States; family and the majority of family friends live in Japan. Their daughter's favorite food is sushi and she uses the GoTalk to choose which ingredients she wants in her meals. The family returns to Japan every summer (dad stays

at home due to work obligations,) where they socialize with a larger network of friends and family. The daughter takes professional photographs in traditional Japanese attire, such as kimonos. Since their daughter's home device is newly acquired this school year, they are unsure how it will be perceived when they travel abroad or if they will take it at all.

### **Parent Communication Expectations and Perceptions of AAC**

Parental expectations for AAC fell within parameters that could be considered positive and negative for both families. Positive perceptions pertained to ideas about AAC that could be described as optimistic or encouraging. Negative perceptions related to pessimistic or discouraging statements about AAC.

P3 was asked about her expectations of augmentative alternative communication. She believes engaging in conversation is the goal of communication because "...to me, just choice-making is not communication...communication is to speak her own mind and her own thoughts." P3 believes that AAC should allow her daughter to independently express herself so that she is not dependent upon someone to interpret what she has to say or not say.

Positive aspects of AAC for P3 include:

- To be able to tell others: this is what I want to do and this is who I want to be.
- Facilitation of full inclusion and treated like she "belongs in this world."
- Offering her child opportunities that were given to her in life.

- Acknowledging that high-tech is only a piece of AAC; Talking Books and scripts have been around much longer
- The question for AAC is not about why, but how

Negative perceptions of AAC for P3 include:

- Eye gaze system is large and requires a place to set it up. Portability plays a major role in accessibility.
- A lack of understanding from some people about the purpose of AAC; it is not enough to give a simple choice of what do you want
- The process itself is overwhelming for some parents as is the technology. A child's diagnosis can be overwhelming by itself without the added stress.
- Professionals can impede the process because they tell parents what can and cannot be done with their child's communication.

P6 had a different belief about AAC. For these parents, the negative aspects outweighed the positive aspects. They interpreted AAC to be voice output devices only and did not agree that pictures and sign language were part of augmentation strategies. They expressed disbelief with the ability for AAC to be an "actual" form of communication that extends beyond making choices. Positive perceptions of AAC for P6 included:

- Helping their child express her feelings instead of hitting or other similar behaviors.
- Making food and activity choices
- Using AAC will make a child "mild" if they have intellectual disabilities.

Negative perceptions of AAC for P6 included:

- Fears that their daughter would never talk if she was given a device.
- Culturally, AAC has negative connotations regarding a person's intelligence.
- AAC will "show people" that their family "has something wrong" and they will be looked down upon
- They do not believe that the daughter likes using the GoTalk at home because it's slow. But, she is very willing to use AAC at school with teachers and peers.

### **Parent Expectations of AAC Professionals**

Both interview participants expressed gratitude toward the professionals that work with their children, stating that they "care" deeply for their students. However, they also expressed frustrations with these same individuals. Parent expectations were able to be coded as positive if the exchange between the professionals and families led to an increase in perceived communication skills and support, while negative experiences led families to perceive a lack of skill development or interest in their child.

Positive expectations for AAC professionals from P3's viewpoint included:

- Provision of emotional support and being genuine
- Modifying and adapting curriculum
- Family support (after they were very clear about their vision for their child's education and their involvement in the IEP meetings)
- Collaboration regarding attainment of goals and the pathway/s to achieve them (Participant Three used the terminology "creating a roadmap" frequently throughout the interview to describe this process)

P3's negative statements regarding AAC professionals included:

- Obtaining ‘buy-in’ for full inclusion and high-tech communication devices
- Being perceived as difficult parents because they are asking for so much from the schools
- Treating her eight-year-old child like she is three or acting like her child is not in the room (this point came up in regards to medical professionals or individuals outside of the school system)
- Coming to personal understandings that perhaps the professionals *can* provide support to the family and that they are not “protruding” into their family’s life
- IEPs spend too much time talking about the weaknesses and challenges and do not lend themselves to start off with strengths.

Participant Six also had positive accounts about the AAC professionals who work with their daughter, including:

- Providing opportunities for communication skill development, including augmentative and alternative strategies in addition to natural speech
- A translator was provided for parents during several hours of AAC/AT assessment and answered their questions.
- Opportunities for observing their daughter in a natural school setting. As reported: “Teacher showed me GoTalk in class. [Daughter] knew how to use it. I cried and got very happy. She talked with it. Thank you [teacher]!”

Negative statements from Participant Six about the professionals who work with their child consisted of:

- Wanting daily one-on-one pull-out sessions with the Speech and Language Specialist and a lack of understanding why the school district will not provide this service.
- Upset that the teachers “will not fix” their daughter and “make her smart.”
- Specifically asked for an iPad because their friend had one but was denied because the professionals did not agree that it was the best fit.

### **Training Needs**

Interview participants were asked to reflect upon the type of education and training they have received with AAC as it pertains to their child. Questions were asked regarding their personal experience with being offered support by AAC professionals and whether or not they felt it was beneficial for them.

Participant Three indicated on her survey that she had had extensive training with AAC, including formal education at San Francisco State University and through agencies outside of Fremont Unified School District. Interview questions sought to elaborate upon this and to uncover the motivations for these actions. Participant Three revealed that she undertook the following steps to ensure that she was knowledgeable about her daughter’s communication:

1. Her daughter had been receiving “traditional” speech and language services through Early Intervention since the age of eighteen months. At this time, they were using choice boards to present options and preferences. However, the family was not satisfied with the limitations of the boards.

2. At the age of three, the daughter was diagnosed with Rett Syndrome. The family researched the disorder and discovered a communication specialist who worked specifically with individuals with rare communication disorders. This person introduced them to eye gaze technology. At this point, they did not understand the differences between speech, communication, and language.
3. Two devices were trialed with their daughter to determine device suitability. A representative from Prentkey Romich Company (a vendor who sells a variety of AAC technology) came to their house to clarify how technology could assist an individual with communication-related disabilities and it was at this time that Participant Three began to understand how it worked.
4. The director of her daughter's preschool AAC team personally instructed the parents on multi-modal communication responses, including pause/wait strategies and how to "phase down." This individualized instruction was beneficial for Participant Three.
5. By Kindergarten, her daughter was using a 15-page layout in her communication device. Participant Three repeatedly asked about the "roadmap" and "where are we going?" She wanted to know how her daughter was going to read and learn. It was at this time that the AAC specialist referred her to Professor Soto at San Francisco State University and recommended that she take an AAC course.
6. Participant Three took two classes at SFSU: AAC and Teaching Individuals with Physical Disabilities. According to the interviewee: "The world just opened up! As the only parent in the classroom with speech and language teachers...it gave me different perspectives of thinking outside of the school and IEPs."
7. Participant Three continually takes any training offered to her, including general AAC strategies and device-specific trainings.



Participant Six was also asked to elaborate upon training they had received for their daughter's communication needs. They stated that they have participated in the following:

1. Teachers at school have talked to them at meetings and they were also invited to watch their child use AAC in class.
2. The GoTalk 4+ was demonstrated for them at IEP meetings and they asked many questions on how to use it to help their daughter. They were given Boardmaker software to create picture boards for the device and shown how to use the computer program to create overlays.
3. Participant Six sends notes to their daughter's teacher in her communication book if they have any questions. According to mom, "If I need help I write in her book to teacher and she helps me."

Participant Six do not feel as if they need more training opportunities at this juncture. Although they acknowledge that the school district has offered workshops on communication and various types of assistive technology, they have elected not to attend the meetings. A lack of daycare during the classes was given as one reason for not attending.

### **Perceived Value and Support from Team Members**

Interview participants were finally asked to comment about the support they receive from members of their child's AAC team. The researcher asked about the principal individuals who provided communication-related instruction to their children and if they perceived their help to be beneficial to the process.

Participant Three's daughter works with the AAC Specialist from Augmentative Communication and Technology Services (ACTS,) which is an agency who is funded

through the school district to provide direct support for students who use AAC, to learn how to use the Eco2 device for expressive language. The school Speech and Language Pathologist works with her daughter on receptive language goals. The school district AAC/AT Specialist provides technology-related support to her daughter and ensures that assistive technology is woven into her curriculum and instruction. Instructional content is generated from the general education teacher and a special education teacher adapts the content. Participant Three describes the team members as being “really invested on how she does in class” and being “very committed.” She emphasized that everyone is very collaborative and she feels that her daughter’s team has her best interest in mind.

Finally, Participant Three wanted school districts to understand that children with complex communication needs:

“have something to say...really look deeper into what they have to say and provide them the experience and the opportunities...get them out there and say yes...everyone comes with their own differences but we are what we are...I think that would be a very positive thing with the school and to be able to say that *this* child belongs in *this* school...”

Participant Six was also asked to discuss how supported they feel as members of their daughter’s AAC team. They commented that the teachers are all very nice to them and expressed an interest in their daughter’s learning. Teachers are helpful when needed and have various AAC devices in class. They do not like the school psychologist because they perceive a lack of willingness to work with them. When probed about this response, Participant Six stated that they did not “appreciate her manner.” But, the school district did have their daughter re-evaluated by another school psychologist who had a better working relationship with them.

Finally, Participant Six were asked if they had additional comments regarding working with the AAC team. They asserted that getting services for their daughter has been “upsetting” because they have not been satisfied with their child’s diagnosis and believe that “more can be done” if this were different.

## CHAPTER FIVE

### DISCUSSION AND INTERPRETATION OF RESULTS

This chapter examines the results of the sequential mixed methods study and its implications for each of the research hypotheses presented in Chapter One. Limitations of the study and implications for further research are also considered.

#### **Discussion of Survey Data**

Survey data were collected for this study in order to investigate the relationship between individuals who use Augmentative and Alternative Communication (AAC) to communicate and how, if at all, languages spoken in home environments influence its use. The language predictor variable guided the investigation. Additionally, survey questions incorporated demographic, non-threatening behavioral questions, and sensitive behavioral questions such as attitude and knowledge about AAC.

Participants represented a total of seven languages spoken at home, with families for whom English was not their first language, comprising more than three-quarters (77%) of responders. AAC users in the study were identified as individuals who applied a multitude of resources to communicate, ranging from “no-tech” to “high-tech” solutions. The positive affect of communication systems which incorporate multiple techniques such as gestures, sign language, pictures, electronic devices with voice output components, facial expressions, etc. have been supported by the research of Calculator (2012), among others, who found that children with Angelman Syndrome (a

chromosomal genetic disorder which symptoms generally contribute to speech and language deficits) often use different strategies to communicate. In the current study, pictures, facial expressions, and gestures were the strategies used the most by children identified as English-only-speaking (100% of students), while the use of a computer with text-to-speech output and high-technology voice output devices were used the least (0% of students). Children identified as non-English-speaking or multilingual used pictures (60% of students), facial expressions (50% of students), and gestures (50% of students) the most. The same population represented in the study reported the use of writing (0% of students) as the least utilized form of AAC. Additionally, while both groups reported minimal use of high-tech solutions, 67% of English-only individuals stated that their child used an iPad but no other high-tech device. In contrast, 40% of parents for whom English was not their primary language stated that their child used an iPad and 15% reported use of other technologies. Curiously, although 100% of survey respondents were identified as receiving AAC services from school district personnel, approximately 30% of combined English-only and non- primary- English-speaking families reported that their student did *not* use these strategies to communicate at home.

As previously outlined, it was hypothesized that non-English-speaking or bilingual families integrated less AAC at home than their English-only speaking counterparts because professionals do not have enough knowledge to successfully support bilingual AAC. This was due, in part, to research which indicates minimal support for bilingual AAC in schools. In specific reference to children with Autism Spectrum Disorder, Wharton et al. (2000) pointed to the lack of specialized services in

native languages for this decision. Paradis et al. (2011) reported the increased incidences of monolingual communication instruction for children with other neurodevelopmental disorders and cognitive impairments.

The survey results described above indicate that this hypothesis was incorrect for the population represented in this study; both groups were similar users of AAC at home as a percentage of the sample (approximately 70%). Also, contrary to the original conjecture, both groups equally used high-tech solutions (22.3%) to communicate.

The second hypothesis presented in the study stated that regardless of home language, self-identified AAC use increases with more family input and training. This includes the supported language(s) of the system, family input into the process and selection of the device, and training for both the user and his or her family. Survey questions incorporated this inquiry.

Various AAC myths and perceptions were posed to both subgroups in order to determine if a family's opinion about AAC could potentially influence its use. Using the Likert Scale to analyze the data, there was no statistical difference between English-only and non-English-only groups concerning the majority of their opinions. Both groups concurred about the following perception according to the statistics: AAC will not keep someone from talking; AAC is medically necessary; mastery of low-tech AAC may be necessary before learning a more sophisticated system; AAC is most likely not a "last resort"; some speech means that AAC is needed; someone may be too cognitively impaired to use AAC; AAC may fix communication difficulties; AAC is not the sole responsibility of the speech and language specialist; and the ability to express basic needs

and wants does not mean that AAC is not needed. However, there was a mean, SD, and p-value discrepancy between groups in their belief that a child can be too young for AAC. A Chi-squared statistical analysis confirmed this discrepancy; English-only families perceived that a child can be too young for AAC, while non- primary-English participants' view was that an individual's age does not impinge on an individual's ability to successfully use AAC.

In regard to the language of the AAC, the study found that, despite the proportional number of AAC users in both groups, only two of the eight English Language Learners' AAC solutions incorporated the family's native language. The practice of not including a child's home language and focusing on one dominant language (English, in this case,) is consistent with the recommendation by some researchers for bilingual families to speak one language to their child with disabilities in order to compensate for general language delays (Kremer-Sadlik, 2005; Wharton et al., 2000; Jordaan, 2008; Paradis, Genesee, & Crago, 2011). However, Kim (2014) denies that this practice should be endorsed because there are no studies to support its efficacy; in contrast, Kim recommends that research- based interventions need to be put into place to foster the home culture and language to better support critical social interactions.

Family input and instruction have also been represented in the current literature as being "of great importance" for a child's linguistic development due to social characteristics and language exposure that are enhanced by such interactions (Krstic & Littorin, 2014, p. 10). The same can be applied to AAC since these types of strategies *augment* but *do not replace* language training for a child. The current study sought to

explore whether families felt they had this type of critical input. The discrepancy between the two study groups concerning parental input into the type of AAC that their child uses was quite high: while 100% of English-only participants stated that they felt involved, only 40% of the non-English-only/ bilingual participants perceived that they were involved. Participants in both groups responded similarly with an affirmative response to the question of whether or not they felt like a valued member of the team which decides upon the type of AAC their child uses (an average of 55% for both groups). Although this figure is consistent with non-English-only respondents to the first parental input question, it is not consistent with their English-only counterparts. The perceived “ability” and “knowledge” by the professionals who provide specific AAC services for their students’ use of AAC at home was reported as quite high, with an average of 69%. This figure is encouraging, given that not all participants felt valued in determining AAC needs.

Effective training is the final component to the second hypothesis regarding key factors to increased AAC use. In the survey results, a staggering 67% of English-only parents perceived that their child did not know how to use their AAC systems. However, 100% of the respondents of this same group stated that they had been offered training on strategies to use AAC with their child. The survey did not explicitly ask why families did not perceive that their child was taught on their AAC despite self-identified access to training opportunities. By comparison, 50% of non-English families perceived that their child could access their systems “well” and 70% had been offered instruction. The majority of both groups perceived that they had been offered instruction but did not believe that it was effective.



The types of student instruction identified by parents were varied. English-only families identified that their child had been taught by the teacher or school (100%) and with device demonstration (50%). Non-English-only families reported a broader range of instructional opportunities for their child: teachers held the highest percentage (78%), followed by Speech and Language Pathologists and other school personnel (67%). A smaller percentage of the sample indicated that their child also received student instruction from an outside agency, home instruction, “don’t know,” and “other”. All study participants also remarked that teacher instruction was the most beneficial type of AAC training. Additionally, there was no statistically significant difference between groups for the benefit of other types of parent instruction.

The efficacy of training for both students and parents may be correlated to sentiments regarding barriers to AAC use. For example, two non-English or multilingual family respondents expressed that they “do not have time to work with” the AAC program and that they needed “more information from his program.” English-only families paralleled some of these frustrations by identifying that additional barriers to use consisted of: the child’s personal desire not to use it, getting “in the way” with day-to-day communication and activities, difficulty with programming, devices being too complicated, and taking too much time. Both groups also identified a lack of practicality as a significant hurdle. To this point, one English-only family member stated that they previously had a device “but it was so complicated we chose to return it” (HP device, not specified)”.

As a result of the study, the hypothesis that AAC use is affected by home language support, family input, and training procedures does not have a definitive answer. The

correlation between the nature of training offered to both parents and children and the percentage of each group feeling that their child could effectively use their AAC is not clear from the survey results. Responses do, however, lend further support to the argument by Light and McNaughton (2012) that training for students and families is a preferred method to support communication development.

### **Discussion of Interview Data**

While the quantitative data obtained in the surveys established a picture of subgroups of the Augmentative and Alternative Communication community in the targeted school district, qualitative data was also attempted in order for survey participants to elaborate upon their answers. Unfortunately, given that only two non-English-speaking families agreed to be interviewed, their responses do not fulfill the terms of a sequential mixed methods research design as outlined by Mertens (2015) because the qualitative sample does not include both non-English and English-only groups. As such, the discussion of interview data should be viewed as an ad hoc analysis.

#### *Participant Number Three*

Parent participant number three was the mother of an eight-year-old girl who primarily uses the Eco2 with EcoPoint eye gaze compatibility for communication. The researcher observed the mother to be extremely passionate and articulate about her viewpoint on the inherent characteristics of communication and its intent. That is:

“I see communication more for her to be able to express herself. Not to have someone interpret what she intends to say or not say...to feel that she has independence of what she wants in her life...[to say] this is what *I* want to do, and this is what *I* want to be. And this is *who* I want to be...” (Participant Three, personal communication, May 31, 2015).

Although these sentiments may reflect what communication researchers have theorized, P3 acknowledged that she did not originally believe communication was possible for her daughter. As her child’s disability of Rett Syndrome became more pronounced, Participant 3 sought out support from various sources. Speech and language pathologists, augmentative and alternative communication specialists, and physical therapists all provided education to the family about how to compensate for the progressive nature of her daughter’s neurological condition. However, Participant 3 was still confused: “...I’m a software engineer and I could not figure out how that [using technology to communicate] was going to come together.” She decided to seek out the answers to her questions by enrolling in both an AAC class and Teaching Individuals with Physical Disabilities class at San Francisco State University. It was through these classes that the “big picture” emerged for Participant 3. Researchers such as Myers (2007) and Goldbart and Marshall (2004), among others, have found that parents of children with complex communication needs frequently teach themselves how to use AAC and the methodology for effectively communicating with their child. Participant 3 has embraced her role as her child’s advocate and believes that her own knowledge about communication practices can only enhance the relationship she has with her daughter.

Participant 3's commitment to her daughter's linguistic competence is a representative example of the impact that family input and "buy in" can have on reported AAC use. Throughout the entire interview, it was quite clear that Participant 3 considers communication to be an invaluable component to academic and functional living skills. Her daughter's prolific use of AAC can be correlated with this belief system.

When developing a complete communication system for her daughter, Participant 3 felt that it was of vital importance for both core and fringe vocabulary to be supported along with social language. Although the family is bilingual and speaks both English and Tamil, the Eco2 voice output device and low-tech communication strategies are only presented in English. When asked if she preferred for the AAC to incorporate her native language as well, Participant 3 responded,

"It does not matter to us because we are more focused on what she has to communicate and it's not been an issue for us that she cannot speak in Tamil...do I really need my child to speak in Tamil? Or do I really need her to just speak up?" (Participant Three, personal communication, May 31, 2015)

In summation, Participant 3 does not feel limited by her daughter's communication system because it encompasses multimodal communication techniques. In her specific case, she feels that professionals have supported her daughter's communication needs and that of the family as well. It is through this shared knowledge and experiences that school professionals and the family have bridged the home-school communication gap.

*Participant Number Six*

The second interview was conducted with a mother and father whose eleven-year-old daughter was recently learning how to use a GoTalk 4+ voice output communication device at home in addition to PECS (Picture Exchange Communication System) and simple sign language. The family speaks Japanese at home and very little English. In contrast to Participant 3, the stated communication goal from Participant 6 was aimed at the ability for their daughter to express her wants and needs when she became frustrated. They hoped that teaching this form of communication would alleviate their daughters' behavior challenges which were derived from her inability to convey such desires.

Due to the pervasive nature of the communication difficulties for the daughter of Participant 6, their daughter's teacher recommended an augmentative and alternative communication assessment. Although the teacher used multiple AAC systems in class with students (single-message VOCA, sequencer VOCA, GoTalk 4+, GoTalk 9+, GoTalk Now application on iPad, picture exchange, etc.) her parents had declined such formal assessments for the home in the past because they did not see the relevance or practical benefits of using these tools outside of the classroom. However, as their daughter's hitting, kicking, and other aggressive behavior became more prominent at home, they felt they had "no choice" but to engage in the assessment process. As a result of the home and school assessment, a GoTalk 4+ voice output communication device was recommended and purchased. Participant 6 was still unsure about using the GoTalk at home, despite the professional recommendation. They did not have confidence that their daughter had the cognitive ability to benefit from the device. In light of their hesitation, their daughters'

teacher offered a classroom visit so that they could see how it was utilized in the classroom. Participant 6 acknowledged that the visit was a catalyst for them to use it at home, commenting:

“Teacher showed me GoTalk in class. [My daughter] knew how to use it. I cried and got very happy. She talked with it. At first I was scared for no talking, but teacher showed me how” (Participant Six, personal communication, June 5, 2015).

The experience of viewing their daughter using AAC for practical communication encouraged Participant 6 and they began to incorporate the communication strategies at home.

In regard to training opportunities, Participant 6 was provided an interpreter and consulted with their daughter’s AAC specialist, speech and language pathologist, and classroom teacher. They were given explicit instruction on various aspects of the device, including tutorials for creating the vocabulary overlays and manual voice recording that the GoTalk required. Participant 6 had many questions for the specialists, all of which were discussed through the use of an interpreter. The parents were given the GoTalk on their initial consult visit to keep at home (their daughter already had one in class) and also a Boardmaker CD to create more communication topic overlays for the device. Participant 6 also related that their daughter had a home-school communication book so that parents and school personnel (primarily the teacher) could collaborate about communication needs as they arise.

Upon inquiry by the researcher concerning the language of the GoTalk and other communication supports used at home, Participant 6 stated that English is the only language used with their daughter (apart from simple sign language.) They were not

aware that there was the possibility to include Japanese and asked if they made a “Japanese GoTalk.” Participant 6 appeared to be interested in this possibility, since they were already pairing Japanese words with their English equivalent. Despite the omission of their native language, Participant 6 were pleased with their daughter’s progress but also recognized some barriers to use:

“[She] doesn’t hit so much. She tells me what she wants with pictures. But [my daughter] doesn’t like it so much. It’s slow. She wants to use it only at school...We want to say thank you teachers” (Participant Six, personal communication, June 5, 2015).

### **Importance of Study Outcomes to Existing Literature**

The researcher’s purpose for this investigation was to explore and further develop the relationship that home language and culture plays in effective augmentative and alternative communication use by an individual. Several researchers have studied various aspects of AAC, including: the assessment process, training and support for both user and communication partners in a variety of contexts, and the importance of continued linguistic access across educational environments, social relationships, daily living activities, and overall quality of life. However, the majority of these studies are heavily influenced by American, Anglo-Saxon values which may not generalize to non-western, non-English AAC users.

Researchers have found fault in their own studies regarding the implications of studying non-English-speaking subjects with western philosophies. For example, while studying the effect of raising individuals with autism spectrum disorders in monolingual and bilingual environments, Finsel (2012) acknowledged that the lack of provision for

participants who did not speak, read or write in English biased the study results because it did not take into consideration that the study participants may not be able to understand what was being asked of them.

This study acknowledges the value for professionals to regard AAC as an invaluable tool to support communication in home and school environments. In addition, it has also supported the need for current best practices to discover strategies that work with individuals of varying cultures and languages. Families need to perceive that they are being given the training and tools essential to holistically communicate with their child and that the professionals working with them are sensitive to the specific needs of the family unit. Cross-cultural and multilingual strategies are inherently necessary to achieve these goals.

### **Limitations of this Study**

The researcher has identified three primary limitations to the outcomes of this study: the number of survey and interview respondents, primary language “item equivalence”, and the type of research questions.

First, the nominal response rate for study participants ( $n= 13$ ) was surprising, given the relatively large number of students receiving augmentative and alternative communication services in the targeted school district ( $n= 87$ ). Additionally, there were significantly more non-English-speaker or multilingual participants (77% in survey and 100% in interview) than English-only (23% in survey and 0% in interviews). Low numbers of study contributors and a noteworthy unequal number in each group have the



potential to skew the data. Recruitment procedures did not elicit interest, even with the \$15.00 gift card incentive. An informal inquiry of effective incentives prior to implementation of the study may assist in alleviating this limitation. Issues of trust, time commitment, difficulty and number of questions, and perceived relevance in the research process may have been a contributor as well.

Second, research which targets individuals from various cultural and linguistic backgrounds can be challenging. This is due to the variance between concepts that may or may not have linguistic equivalence between English and non-English languages. For example, Krstic and Littorin (2014) related that the concept of “foot” was not the same in Swahili and English: in the English language a “foot” is the part of the body below the ankle joint, whereas in Swahili, this word includes the entire limb above and below the ankle joint. The authors use this sample to illustrate that a referent can change according to the specific language. In light of such discrepancies between references, and in order to reduce the potential for miscommunication, this researcher hired a professional translator to translate the survey into Spanish in order to minimize bias in the source materials. An interpreter who was knowledgeable about basic special education concepts but not specifically familiar with AAC posed its own limitation because the researcher relied on him to appropriately translate the source material into Spanish using a decentering methodology. Despite these efforts, terminology that is specific to the AAC field may not have been sufficiently explained to overcome this barrier. Also, respondents represented seven languages; therefore, not all individuals were afforded the same opportunity to answer a survey in their primary language.

The third limitation identified in this research is in regard to the actual research questions. Respondents were asked to answer questions about a subject that they may have a minimal amount of understanding. For example, 30% of survey respondents indicated that their child did not use AAC at home, despite the fact that all of these children received services. This could indicate that families either do not know they are using it, or that they were choosing not to use it. Similarly, the same individuals who responded that their child uses an iPad for communication also stated that their child did not use high-tech” communication devices. The discrepancy noted in the above examples indicates the potential for invalid or inaccurate reporting data.

Subsequent research would benefit from taking into consideration techniques to overcome the identified study limitations.

### **Implications for Future Research**

Future researchers in the Augmentative and Alternative Communication field may consider exploring the phenomenon that occurred in this study in which 30% of survey respondents indicated that their child did not use AAC at home despite their child being identified as an AAC user by the district Assistive Technology Specialist. Perhaps these families need more education about how to holistically incorporate these strategies into their home routines in a manner that is consistent with their family’s unique linguistic and cultural values. They may also need more collaboration time with AAC professionals, where they can be candid about what their family truly needs in the area of support. If a family does not use AAC resources due to language or cultural reasons, perhaps

additional experimental research techniques could divide these families into experiment groups in which the researcher provides the non-control group(s) with a specific, evidence-based practice to increase bilingual language acquisition and then collect data to determine its efficacy on AAC usage.

In addition, future researchers may also be able to link these families (those who have a child with AAC needs and established AAC services but do not use AAC at home) to families with prolific AAC users. The family who uses AAC may be able to provide some valuable insight and/or moral support to a family in a form of mentorship. A researcher could gain insight from this type of connection by comparing and contrasting what happens when an AAC non-user is partnered with an AAC user. If the research shows a positive correlation, perhaps the results could be used as a catalyst for future AAC intervention or community groups.

## **Summary**

This investigation was designed to evaluate aspects of AAC that either hinder or positively influence both non-English-only and English-only families from using these communication tools. The data is representative of current AAC practices at the time of the study, the school district, funding availability, the number of eligible students, and the service delivery of the current AAC/AT Specialist. This researcher identified two hypotheses prior to study implementation: reported AAC use increases with more family input and AAC use by non-primary- English-speakers is not as high as the English-only subgroup due to decreased primary language specific practices by professionals.

Based upon the data collected in this mixed methods research design, the hypothesis that AAC use is negatively impacted when the primary home language is not English is not supported; both English-only and non-English-only children consistently use AAC at equivalent rates. This result is inclusive of the fact that 75% of bilingual children identified in this study do not have AAC solutions that support their primary language. According to Participant 6's interview, although some families may be interested in bilingual tools when they become aware of the possibility, it does not always account for how much the tools are being used.

According to survey and interview participant answers, the hypothesis that AAC use for both English-only and non-English-only families will be positively influenced by increased family input and training can neither be corroborated nor refuted. This conclusion is due to a number of issues. First, the researcher found a discrepancy between the rates a family felt involved in the AAC process for the participant subgroups. However, both groups, on average felt they were valued members of the IEP team. Second, more English-only children did *not* know how to use their device as compared to their non-English counterpart. But, more English-only families were offered training. Third, both populations say teacher instruction provided the most benefit to them and there was not a statistical difference between groups as to other types of beneficial assistance. The assessment and instruction process described to the researcher by Participants 3 and 6 provided support for the hypothesis that AAC use increases with family input and different types of training.

Although the first hypothesis was negated and the second hypothesis could not be verified by the data, this research was still valuable because it investigated a minimally-researched population in the AAC community. Both English-only and non-English-only groups need access to evidence-based practices to support augmentative and alternative communication methods. Bilingual AAC remains an important component for many families and children. If communication is to be respected as a basic human right for *everyone*, then *everyone* has the right to learn to communicate, regardless of primary language or mode.

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**APPENDIX A**  
**PARENT/GUARDIAN INFORMED CONSENT**

**California State University East Bay**

**Informed Consent to Participate in a Research Study**

*“A Pragmatic Needs Assessment For English and Non-English-Speaking Families  
Utilizing Augmentative Alternative Communication (AAC) at Home”*

**PURPOSE AND BACKGROUND**

The purpose of this research study is to learn more about the role that home language (English or other language spoken at home) use has on a child’s ability or interest in using Augmentative Alternative Communication (AAC) to communicate at home. AAC is defined as a person’s use of signs, pictures, or voice output devices instead of or in addition to natural speech.

The researcher, Elizabeth Alder, is a graduate student at California State University East Bay conducting research for a Master’s degree thesis and a special educator in [identified school district].

You are being asked to participate in this study because you have a son or daughter who uses Augmentative Alternative Communication (AAC) to communicate and is being served by a special educator in the [identified school district].

## A. PROCEDURES

If you agree to participate in this research study, you will be asked to:

- Complete a survey about your experiences using Augmentative Alternative Communication (AAC) with your child.
- Return the completed survey in the self-addressed stamped envelope that is provided within 2 weeks.
- Complete the survey at a time and location of your choice
- You can choose to participate in a follow-up interview with the researcher to clarify your survey answers. You decide whether you would also like to be interviewed.

If you would like to participate in the interview portion of the research please mark this at the bottom of the completed survey with your contact information.

**The first ten participants who agree to be interviewed will receive a \$15.00 gift card to Target as an added benefit to participation.**

Total time commitment to complete the survey will be approximately 20 minutes.

If you choose to be interviewed this will be scheduled at your convenience and will take about 30 minutes. A translator will be provided if you would like one.

## B. RISKS

There is a risk of loss of privacy. However, no names or identities will be used in any published reports of the research. Only the researcher will have access to the research

data. There is a risk of discomfort or anxiety due to the nature of the questions asked; however, the participant can answer only those questions he/she chooses to answer, and can stop participation in the research at any time.

**D. CONFIDENTIALITY**

The research data will be kept in a secure location, and only the researcher and translator (if applicable) will have access to the data. At the conclusion of the study, all identifying information will be removed and the data will be kept in a locked cabinet in the researcher's home office. All identifying information collected in the study will not be made available to Fremont Unified School District or California State University, East Bay.

**E. DIRECT BENEFITS**

There will be no direct benefits to the participant.

**F. COSTS**

There will be no cost to you for participating in this research.



**G. COMPENSATION**

There will be no compensation for participating in the survey portion of this research.

**The first ten people who agree to participate in the interview portion of the research will receive a \$15.00 gift card to Target as an added benefit to participation.**

**H. ALTERNATIVES**

Not applicable

**I. QUESTIONS**

If you have any further questions about the study, you may contact the researcher by email at [eisola@horizon.csueastbay.edu](mailto:eisola@horizon.csueastbay.edu) or phone at (510) 909-2456.

Questions about your rights as a study participant, or comments or complaints about the study, may also be addressed to the research advisor, Professor Ann T. Halvorsen, at [ann.halvorsen@csueastbay.edu](mailto:ann.halvorsen@csueastbay.edu), or the CSUEB Office of Research and Sponsored Programs at [irb@csueastbay.edu](mailto:irb@csueastbay.edu) or (510) 885-4212.

**J. CONSENT**

You may request a copy of this consent agreement.

**PARTICIPATION IN THIS RESEARCH IS VOLUNTARY. You are free to decline to participate in this research study, or to withdraw your participation at any point, without penalty. Your decision whether or not to participate in this research study will have no influence on your present or future status at [identified school district] or California State University, East Bay.**

Signature

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Research Participant

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Date

**APPENDIX B**  
**PARENT SURVEY**

March 15, 2015

Dear Parent or Guardian,

My name is Elizabeth Alder and I am a graduate student at California State University East Bay and also a special education teacher here in [identified school district].

I am conducting a district-wide study on the use of Augmentative Alternative Communication (AAC) use at home by families whose children use alternative ways to communicate, including the use of sign language, pictures, and voice output devices. The purpose of this research study is to gain information from parents/guardians of children who use AAC at home about their collaboration practices and the factors needed in order to help maximize learning across home and school.

The potential benefits of this research will be the opportunity to learn about types of family support needed for AAC use in home environments. Research findings may also indicate additional steps that special education personnel can take to ensure AAC accessibility and benefits to students and their families. If the research data indicates that cultural and language variables are indeed correlated to AAC use at home, professionals can utilize this information to better serve their students. This information can be shared with [identified school district] and the [SELPA]. **In addition, the first ten families who respond to the survey and agree to participate in an interview will also receive a \$15.00 gift card to Target as an added benefit to participation.**

## **SURVEY INFORMATION**

You are being asked to participate in a research study conducted by graduate student Elizabeth Alder from California State University East Bay (CSUEB.) You were selected as a possible participant in this study because you currently have a son or daughter who uses Alternative Augmentative Communication (AAC) who is being served by a special educator in [identified school district].

### **Why is this study being done?**

The purpose of this study is to gain information from parents/guardians of children who use AAC (Augmentative Alternative Communication) at home about their collaboration practices and the factors needed in order to help maximize its use at home as needed. The research will also investigate the role that home language (English or a language other than English) has in collaboration practices.

### **What will happen if I take part in this research study?**

If you volunteer to participate in this study, you will be asked to complete a survey by hand. The survey asks you questions about your beliefs, experiences and background.

The survey can be completed at your convenience. At the end of the survey you will also have an opportunity to participate in a short interview about this topic. **The interview is entirely voluntary and does not affect the survey results.**

**How long will I be in the research study?**

Participation in the study will take you about 20 minutes to complete the survey.

**Are there any potential risks or discomforts that I can expect from this study?**

You will be asked how you use AAC at home with your child and how you collaborate with special educators in [identified school district]. There are no anticipated risks or discomfort with participating in this study. If any questions make you feel uncomfortable, you may skip the question.

**Are there any potential benefits if I participate?**

Your participation in the research will help special educators better assist you in using AAC at home with your child.

**Will I receive any payment if I participate in this study?**

There is no payment for participation in this study. If you choose to participate in a short interview, the first 10 respondents will receive a **\$15.00 gift card to Target as an added benefit.**

**Will information about me and my participation be kept confidential?**

Yes, your participation will be kept confidential. You have the choice to give or withhold information that can identify you as a study participant. Additionally, all data collected will be safeguarded and will only be available to the researcher.

### **What are my rights if I take part in this study?**

You are not waiving any of your legal rights if you choose to be in this research study.

You may refuse to answer any questions that you do not want to answer and still remain in the study.

### **Who can answer questions I might have about this study?**

If you have any questions, comments or concerns about the research, you can contact Liz

Alder by phone at (510) 909-2456 or by email at: [elisola@horizon.csueastbay.edu](mailto:elisola@horizon.csueastbay.edu). You

may also contact her research advisor, Professor Ann T. Halvorsen, at

[ann.halvorsen@csueastbay.edu](mailto:ann.halvorsen@csueastbay.edu). If you wish to ask questions about your rights as a

research participant or if you wish to voice any problems or concerns you have about the

study to someone other than the researchers, please contact the CSUEB Office of

Research and Sponsored Programs at [irb@csueastbay.edu](mailto:irb@csueastbay.edu) or 510-885-4212.

### **Participation and Withdrawal**

You can choose whether or not you want to be in this study. You can decide to not participate without consequences of any kind.

### **Consent**

By completing the survey, you are consenting that you understand the information described above.

**AUGMENTATIVE ALTERNATIVE COMMUNICATION (AAC) PARENT  
SURVEY**

\*\*Return completed survey to: Elizabeth Alder

1165 Burkhart Avenue

San Leandro, CA 94579

Please answer each question:

1. What is your child's gender?

\_\_\_boy            \_\_\_girl

2. How old is your child?

\_\_\_Under age 5    \_\_\_6-9 years old    \_\_\_10-14 years old    \_\_\_15 years old or

3. What type of disability does your child have? (check all that apply)

<input type="radio"/> Speech and Language	<input type="radio"/> Orthopedic Impairment
<input type="radio"/> Autism	<input type="radio"/> Other Health Impairment
<input type="radio"/> Intellectual (Formerly Mental Retardation)	<input type="radio"/> Specific Learning Disability
<input type="radio"/> Emotionally Disturbed	<input type="radio"/> Visual Impairment
<input type="radio"/> Hearing Impairment	<input type="radio"/> Traumatic Brain Injury
<input type="radio"/> Multiple Disabilities	<input type="radio"/> Deaf-Blindness

4. What language(s) do you speak at home? (check all that apply)

\_\_\_English        \_\_\_Spanish    \_\_\_Other (please specify)\_\_\_\_\_



5. What is your primary language that you speak at home?

English       Spanish       Other (please specify) \_\_\_\_\_

6. Does your child use Augmentative Alternative Communication (AAC) at home? (AAC are tools that help an individual communicate with others)

Yes       No       Don't know

7. If yes to #5, what do they use? (Please list)

\_\_\_\_\_

8. Does your child use any of these to communicate? (check all that apply)

<input type="checkbox"/> Sign Language	<input type="checkbox"/> Pictures/Photographs
<input type="checkbox"/> Facial Expressions	<input type="checkbox"/> Gestures
<input type="checkbox"/> Communication or Choice Boards	<input type="checkbox"/> Icons/Symbols
<input type="checkbox"/> Computer with Voice Reader, Text-to-Speech Software	<input type="checkbox"/> Low-Tech Voice Output Device (devices that produce recorded speech, usually has pictures or other visual support with a limited vocabulary, examples: BIGmack, GoTalk, iTalk2, Step-by-Step, etc.)
<input type="checkbox"/> iPad, iPod Touch, Other Tablet	<input type="checkbox"/> Writing
<input type="checkbox"/> Head Wand or Mouth Stick	<input type="checkbox"/> High-Tech Voice Output Device (devices that produce digital or recorded speech, typically requiring the user to type or search for words and/or phrases from a wide selection of vocabulary, examples: Dynavox, Vantage, Springboard, etc.)
<input type="checkbox"/> Something Else (Please Specify) _____	

9. How does your child access AAC? (check all that apply)

<input type="checkbox"/> Fingers or Hand	<input type="checkbox"/> Someone Helps Them
<input type="checkbox"/> Head or Jaw	<input type="checkbox"/> Attached to Wheelchair
<input type="checkbox"/> Use of Other Body Part	<input type="checkbox"/> Eye Gaze
<input type="checkbox"/> Scanning	<input type="checkbox"/> Presses a Button or Picture
<input type="checkbox"/> Other (Please Specify) _____	

10. In your opinion, how well does your child know how to use their AAC?

\_\_\_\_\_ very well

\_\_\_\_\_ well

\_\_\_\_\_ not very well

\_\_\_\_\_ not at all

\_\_\_\_\_ don't know

11. Who made the referral or recommendation for Augmentative Alternative Communication (AAC)?

\_\_\_\_\_ I did

\_\_\_\_\_ My child's school

\_\_\_\_\_ Someone else (Please specify) \_\_\_\_\_

12. Does your child use AAC at school?

\_\_\_\_\_ Yes

\_\_\_\_\_ No

\_\_\_\_\_ Don't Know

13. Does your child use AAC at home?

\_\_\_\_\_ Yes, all the time

\_\_\_\_\_ Yes, sometimes

\_\_\_\_\_ No

\_\_\_\_\_ Don't know

14. If yes to #12, How does your child use AAC at home? (Check all that apply)

\_\_\_\_\_ communication between family members

\_\_\_\_\_ to answer questions

\_\_\_\_\_ I teach my child how to use it

\_\_\_\_\_ to make comments

\_\_\_\_\_ to tell me about their day

\_\_\_\_\_ to complete homework

\_\_\_\_\_ to make choices

\_\_\_\_\_ to ask for something

\_\_\_\_\_ to participate in activities

\_\_\_\_\_ casual conversation

\_\_\_\_\_ someone else teaches my child how to use it (therapist, teacher, a friend,  
etc.)

\_\_\_\_\_ Other (please specify) \_\_\_\_\_

15. Where does your child use AAC?

\_\_\_\_\_ home

\_\_\_\_\_ school

\_\_\_\_\_ stores

\_\_\_\_\_ community activities

\_\_\_\_\_ other (please specify) \_\_\_\_\_

16. Who does your child use AAC with?

\_\_\_\_\_ teachers

\_\_\_\_\_ other children

\_\_\_\_\_ friends

\_\_\_\_\_ parents

\_\_\_\_\_ family

\_\_\_\_\_ community

\_\_\_\_\_ other (please specify) \_\_\_\_\_

17. What type of training has your child received to learn how to use the AAC? (select all that apply)

\_\_\_\_\_ a teacher teaches them

\_\_\_\_\_ a speech and language pathologist teaches them

\_\_\_\_\_ someone from another agency teaches them

\_\_\_\_\_ trained at school

\_\_\_\_\_ someone comes to my home to train my child

\_\_\_\_\_ scripting

\_\_\_\_\_ device demonstration

\_\_\_\_\_ my child has *not* been trained

\_\_\_\_\_ don't know

\_\_\_\_\_ other (please specify \_\_\_\_\_)

18. Has someone offered to train you how to use AAC with your child?

\_\_\_\_\_yes

\_\_\_\_\_no

\_\_\_\_\_don't know

19. What type of training have you received to support your child with AAC? (select all that apply)

\_\_\_\_\_my child's classroom teacher has taught me

\_\_\_\_\_my child's speech and language teacher has taught me

\_\_\_\_\_someone from an outside agency taught me

\_\_\_\_\_AAC implementation workshops, conferences or seminars

\_\_\_\_\_device specific training from the company

\_\_\_\_\_read books, articles, or other literature

\_\_\_\_\_instructional videos

\_\_\_\_\_online (please specify websites\_\_\_\_\_)

\_\_\_\_\_none

\_\_\_\_\_don't know

\_\_\_\_\_other (please specify\_\_\_\_\_)

20. How beneficial would the following types of AAC training do you think would be useful to you? Please rate 1-5 where 1= Not beneficial 5= Very beneficial

<b>Type of training</b>	<b>1</b> <b>Not</b>	<b>2</b>	<b>3</b> <b>A little</b>	<b>4</b>	<b>5</b> <b>Very</b>
Training from a teacher					
Training from an outside					
Books, articles, or other					
Instructional videos					
Specific training on the					
AAC conferences,					
Something else					

21. Are you a member of any of these organizations that support families, Augmentative Alternative Communication (AAC) learners, individuals with disabilities, etc? (select all that apply)

\_\_\_\_\_ CAL-TASH

\_\_\_\_\_ The Bridge School

\_\_\_\_\_ Autism Speaks

\_\_\_\_\_ ASHA (American Speech and Hearing Association)

\_\_\_\_\_ PTA

\_\_\_\_\_ Other support network or group (please specify \_\_\_\_\_)



23. Families sometimes choose not to use AAC at home for a lot of reasons. What prevents you from using AAC more at home? (check all that apply)

<input type="radio"/> I don't remember how to use it	<input type="radio"/> my child does not want to use it
<input type="radio"/> my child only needs it at school	<input type="radio"/> my child does not know how to use it
<input type="radio"/> the AAC device uses English but I speak Spanish	<input type="radio"/> the AAC device uses Spanish but I speak English
<input type="radio"/> I was not trained how to use it	<input type="radio"/> my child doesn't need it
<input type="radio"/> it's too complicated	<input type="radio"/> it's not practical
<input type="radio"/> it gets in the way	<input type="radio"/> I need more information
<input type="radio"/> it's inadequate for communication	<input type="radio"/> does not have enough vocabulary
<input type="radio"/> takes too much time	<input type="radio"/> lack of AAC services
<input type="radio"/> I don't need it. I know what my child is communicating	<input type="radio"/>

24. Please rate how well you agree with the following statements, where 1= don't agree

5=completely agree:

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
	<b>Don't</b>		<b>Agree</b>		<b>Completel</b>
AAC will keep someone from					
AAC is not medically necessary					
Mastery of low-tech AAC is					
AAC is a "last resort"					
Some speech means that AAC is					
Someone can be too cognitively					
AAC will fix communication					
AAC is the responsibility of the					
A child can be too young for AAC					
Ability to express basic needs and					

25. Without the use of AAC, how often do you understand what your child is trying to communicate?

\_\_\_\_\_All the time

\_\_\_\_\_Some of the time

\_\_\_\_\_None of the time

\_\_\_\_\_don't know

26. What language does the AAC use?

\_\_\_\_\_English

\_\_\_\_\_Spanish

\_\_\_\_\_Other (please specify)\_\_\_\_\_

27. Do you have input into the type of AAC that your child uses?

\_\_\_\_\_yes

\_\_\_\_\_no

\_\_\_\_\_don't know

28. Do you feel like a valued member of the team that decides on the type of AAC that your child uses?

\_\_\_\_\_yes

\_\_\_\_\_no

\_\_\_\_\_don't know

27. Do you feel that professionals are knowledgeable about how to support your family's use of AAC at home with your child?

\_\_\_\_\_yes

\_\_\_\_\_no

\_\_\_\_\_don't know

28. Is there anything else you would like to share about your child's use of AAC at home?

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Would you be interested in participating in an interview about Augmentative Alternative Communication (AAC) use by your child? The interview questions will help the researcher know more about how your child uses AAC at home to communicate. Participation in the interview does not affect your participation in the survey component of the research. If yes, please give the following information so that you can be contacted by the researcher:

Name\_\_\_\_\_

Phone number\_\_\_\_\_

Email address (if you have one)\_\_\_\_\_

Best contact days/times\_\_\_\_\_

**\*\*\*The first 10 survey responders who agree to participate in the interview portion of the research will receive a \$15.00 gift card to Target as an added benefit to participation.**

Please return completed survey in the included self-addressed stamped envelope to:

Elizabeth Alder

1165 Burkhart Avenue San Leandro, CA 94579 (510) 909-2456

[eisola@horizon.csueastbay.edu](mailto:eisola@horizon.csueastbay.edu)

Thank you, Elizabeth Alder

## **APPENDIX C**

### **SEMI-STRUCTURED INTERVIEW QUESTIONS**

*Explanation of Acronyms Used:*

- AAC- Augmentative Alternative Communication
- IEP- Individualized Education Program
- PECS- Picture Exchange Communication System

*Establishing Rapport:*

1. Review purpose of the interview- follow-up to survey regarding use of AAC at home, including definition of Augmentative Alternative Communication
2. State my credentials- Multiple Subject with Supplemental English Composition credentials, Level 1 Moderate-Severe Education Specialist credential, Candidate for Master's Degree in Special Education, Teacher of students who have moderate-severe disabilities for 5 years (high school and elementary levels)
3. Information needed- Family's individual experience of using AAC in home environments
4. Provide assurance of confidentiality, sign Informed Consent document, ask permission to tape interview for research purposes only

*Possible Clarification Questions:*

1. "You mentioned several things. Let me be sure I have this right..."
2. Give opportunity to clarify questions from survey data (Example: "On question number when asked you stated as your answer. Can you please tell me more about that?")
3. Summarize what I've heard, then ask for specifics

*Interview Questions:*

1. Please tell me about your child (interests, hobbies, etc.)
2. What type of AAC does your child use? How long has he/she been using \_\_\_\_? (name of device if applicable)
3. If a device is used, Can you please describe and tell me when he or she uses it? In what type of situations? (at home, community, school, to request, etc.) Who do they use it with? (family, friends, etc.)
4. Please tell me about your family (ethnicity, language/s spoken at home, family's primary language, child's primary language, etc.)
5. What does communication look like to you? How do you communicate? How does your child communicate? (gestures, device, few/many words, oral speech, PECS, etc.)
6. What services are available to you from the school district regarding your child's use of AAC?
7. How did you first learn about your child's device? Did you meet with the IEP team to discuss your child's communication?
8. Did you specifically ask for a device or was it offered during an IEP?
9. Do you feel the school district included you in choosing \_\_\_\_ as your child's device? Why or why not? (i.e. who, what, when, where, why of the decision)
10. What goals or expectations do you have of \_\_\_\_ and have they been met?
11. Do you think these goals/expectations are the same for professionals? Please give an example.



12. What type of training did you receive with the device? (teaching settings, programming, appropriate use of device, number of hours, ongoing support, etc.)
13. Who was involved in your training? (agencies, people, etc.)
14. Do you think this was enough training? Too much? Too little?
15. What type of training has your child received? (teaching settings, how to use the device, number of hours, ongoing support, etc.) From who? (agencies, people, etc)
16. Do you think this is enough? Too much? Too little?
17. Are you satisfied with your child's use of \_\_\_?
18. What changes, if any, do you currently see with your child as he/she learns to use \_\_\_? (confidence levels, desire to communicate, academic skills, social skills, behavior, etc.) What would you like to see in the future?
19. If your child did not use \_\_, would you know what they were trying to communicate? Why or why not?
20. You indicated that you speak \_\_\_ at home. Do you feel that people working with you are knowledgeable about how to support your child's use of \_\_\_ at home?
21. If yes to #17: What did they do to support you? Can you give me an example?
22. If no to #17: What type of support do you need from professionals? Are there any special factors about this problem that I should understand? What would you like to see happen?
23. What advice do you have for families who are using AAC at home? What advice do you have for professionals when working with families?

24. If you could start this AAC selection experience again, what would you do the same?

Differently?

25. Is there anything else about AAC that you think I should know?

*Conclusion of Interview:*

1. Briefly summarize key points of the interview.
2. Explain what I will do with the interview responses.
3. Thank the respondent.
4. Follow-up with thank you letter.