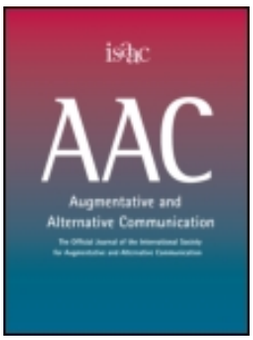

Augmentative and Alternative Communication

ISSN: 0743-4618 (Print) 1477-3848 (Online) Journal homepage: http://www.tandfonline.com/loi/iaac20

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To cite this article: Gloria Soto & Betty Yu (2014) Considerations for the Provision of Services to Bilingual Children Who Use Augmentative and Alternative Communication, Augmentative and Alternative Communication, 30:1, 83-92, DOI: 10.3109/07434618.2013.878751

To link to this article: https://doi.org/10.3109/07434618.2013.878751

Published online: 28 Jan 2014.

Augmentative and Alternative Communication, 2014; 30(1): 83–92

ISSN 0743-4618 print/ISSN 1477-3848 online
DOI: 10.3109/07434618.2013.878751

informa
healthcare

FORUM NOTE

Considerations for the Provision of Services to Bilingual Children Who Use Augmentative and Alternative Communication

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Abstract
Augmentative and alternative communication (AAC) service providers are increasingly serving a significant number of clients from culturally and linguistically diverse backgrounds. In this paper, we discuss general considerations and future research needs relevant to the use of AAC strategies and techniques with bilingual children, specifically, issues related to the scaffolding of communication and language development in more than one language, and the selection and customization of AAC systems for bilingual children. We do so by first reviewing key research on bilingualism with children with communication disabilities and its implications for research and practice in the AAC field. We propose the use of a sociocultural approach to AAC service delivery and argue for the support of both languages needed by the child to fully participate in his or her communicative environments. Implications of the sociocultural perspective and future research needs are also presented.

Keywords: *AAC; Bilingualism; Language; Culture*

Introduction

The continued population movement of the last few decades – from developing countries into industrialized ones and from rural areas into big cities – has resulted in an unprecedented increase in the number of children and families from culturally and linguistically diverse backgrounds being served by clinicians and educators world wide (e.g., Arnaiz & Soto, 2003; Jordaan, 2008; Williams & McLeod, 2012). The Multilingual Affairs Committee of the International Association of Logopedics and Phoniatrics recently surveyed speech-language pathologists in 13 countries: Belgium, Bulgaria, Canada, Denmark, England, Iceland, Ireland, India, Israel, Malaysia, Malta, South Africa, and Sweden. In all, 92% of the respondents reported working with bilingual clients (Jordaan, 2008). Likewise, Kritikos (2003) reported that 95% of SLPs in the US work with at least one client who comes from a home where a language other than English was spoken. Rossi and Balandin (2005) noted that 16% of Australians speak a language other than English in their homes. Consequently, professionals in these countries will likely be involved in developing and implementing educational and clinical services for children and families who may not speak the same language or share the same cultural background.

The provision of educational and clinical services to children with communication disorders from culturally and linguistically diverse backgrounds presents common challenges to professionals around the world and has received increased attention from researchers and professional organizations in Australia, Canada, the United Kingdom, and the United States (Williams & McLeod, 2012). Many of the challenges revolve around four main issues: (a) how to accurately assess a child's communicative ability in more than one language (e.g., De Lamo White & Jin, 2011;), (b) how to best support language development in bilingual children with disabilities that affect their language learning (e.g., Kohnert, 2010; Williams & McLeod, 2012), (c) what language to use in intervention (e.g., Gutierrez-Clellen, 1999; Kohnert, 2010), and (d) how to counsel families who speak another language and come from a different culture (e.g., Yu, 2013).

While many of the challenges inherent in working with bilingual children with communication disorders also apply, professionals working with bilingual children with augmentative and alternative communication (AAC) needs face additional challenges specifically related to the selection, customization, and implementation of AAC strategies and techniques. The purpose of

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(Received 18 March 2013; revised 28 October 2013; accepted 15 November 2013)

this forum paper is to discuss (a) general issues relevant to the provision of AAC services to bilingual children, most specifically the challenges presented when there are two languages in the child's environment; and (b) issues related to the selection and customization of AAC systems for children who are bilingual. We do so by first reviewing key research on bilingualism that is relevant for children with communication disabilities and by examining its implications for research and practice in the AAC field. We then discuss issues related to the provision of culturally and linguistically relevant AAC services to children from bilingual backgrounds, especially those from minority-language families. We propose the use of a sociocultural approach to AAC service delivery and argue for the support of both languages needed by the child to fully participate in his or her communicative environments. Our discussion is largely speculative at this point and is intended as a starting point to advance the field's understanding of and to stimulate future research into these issues.

Bilingualism in Children with Typical Development

Children become bilingual to different degrees and by following different paths. For some children, exposure to more than one language begins very early in life and simultaneously, as family members and care providers speak two different languages to the infant. But for many children, the exposure to a second language happens later in life, when they enter the educational setting and begin interacting with a broader community. When children are exposed to additional languages at age 3 years or older they are considered to develop sequential bilingualism (Kohnert, 2010).

The degree to which children can become proficient speakers of two or more languages, whether learning simultaneously or sequentially, depends on whether they have enough exposure to both languages and are provided with frequent and meaningful opportunities to use and develop each linguistic system. In cases where the home language is not actively supported at school, the child will have limited opportunities to use his or her home language outside of the family or the immediate community, and is at risk of becoming receptively bilingual. Children who are receptively bilingual may continue to understand their home language to some extent, but have little or no expressive skills. In some situations, the home language may be accorded low social status and perceived as a liability or a barrier to social integration. In such circumstances, acquisition of the societally dominant or majority language may be favored and a child may lose skills and fluency in the home language to the point where he or she gradually undergoes language attrition and even language loss (Fishman, 2006; Wong-Fillmore, 2000).

Language loss has been found to be associated with low academic performance and social marginalization. In a meta-analysis of studies comparing different educational options for bilingual children, Rolstad, Mahoney, and Glass (2005) found that immigrant children who maintained their home language were more likely to graduate high school and to develop close family and cultural connections associated with social integration and emotional health than those who lost their home language. Kohnert (2010) reports that continued support of the home language during the preschool years is related to later cognitive and academic gains. In addition, bilingualism has been associated with stronger performances in metalinguistic reasoning, attentional control, working memory, and symbolic representational skills (Adescope, Lavin, Thompson, & Ungerleider, 2010). In a recent study, bilingualism was found to be related to delays in the onset of cognitive decline in older adults (Bialystok, Craik, & Luk, 2012)

Bilingualism in Children with Communication Disabilities

While there is ample data on the advantages of bilingualism for typically developing children, many professionals and parents are still fearful of speaking more than one language with children who have significant communication disorders (Yu, 2013). They worry that bilingualism would be too taxing for children who are already struggling with language, or may further delay the acquisition of one or both languages (Gutierrez-Clellen, 1999). The assumption is that if the child has difficulty learning one language, learning two would be even more difficult and could exceed his or her learning capacity (Kohnert, 2013). As a result, parents are routinely advised to stop speaking their home language with a child who has communication disabilities (Kay-Raining Bird et al., 2005; Kohnert, 2013; Yu 2013). Similarly, professional services to bilingual children are often delivered only in the majority or socially dominant language.

To date, only a small number of studies have compared the performance of bilingual and monolingual children with communication disorders. Several researchers have found that bilingual children with specific language impairments present the same pattern and extent of deficits as monolingual children with specific language impairments on measurements such as IQ tests, academic performance, standardized language tests, and measurements of the use of obligatory tense morphemes (Gutierrez-Clellen, Simon-Cereijido, & Wagner, 2008; Håkansson, Salameh, & Nettelbladt, 2003; Paradis, Genesee, & Crago, 2010; Thordardottir, 2010). Bilingual children with Down syndrome have also been found to perform comparably to monolingual children with Down syndrome on standardized language tests, vocabulary inventories, and language sample analyses (Kay-Raining Bird et al., 2005). Similar results have been found with children with autism spectrum disorder, with no significant differences found in their social responsiveness, joint attention skills, achievement of early language milestones,

or performance on standardized tests of vocabulary and language (Hambly & Fombonne, 2012; Ohashi et al., 2012; Petersen, Marinova-Todd, & Mirenda, 2012).

The findings of this emerging body of research echo the findings of bilingual development research at large: The performance of bilingual children with communication disabilities is comparable with monolingual peers with similar disabilities, at least in contexts that value bilingualism. Also similar to typically developing bilingual children, bilingual children with disabilities can use their first language skills to facilitate the acquisition of a second language. Perozzi and Chavez-Sanchez (1992) found that a group of bilingual Spanish-speaking first graders with language delays were able to acquire new vocabulary in English twice as quickly when they were introduced to the words in both Spanish and English rather than in English alone. Likewise, in a study of a bilingual child with specific language impairments who spoke English and Icelandic, Thordardottir et al. (1997) found that the child learned more English vocabulary when the target words were presented bilingually, in English and Icelandic; as opposed to monolingually, in Icelandic.

The available evidence suggests that social and environmental factors play a significant role in the bilingual development of children with typical development or communication disabilities. For example, in a study of school children with SLI in England, Crutchley, Botting, and Conti-Ramsden (1997) noted that the students who were exposed to languages other than English at home stood out as a unique subgroup, performing more poorly than their monolingual classmates on a number of standardized assessments in English grammar, vocabulary, reading, articulation, and narrative structure. The bilingual students were also less likely to be placed in classrooms that were seen as ideal by parents and teachers, and were more likely to be red-flagged as having emotional and behavioral difficulties. These emotional and behavioral problems were reported to worsen over time, even though the bilingual students were no different from their monolingual classmates on these measures when they first arrived in the program. These findings cannot be interpreted in isolation, as these children were immersed in contexts where their home language was neither valued nor supported.

Crutchley et al.'s study stands in contrast to that of Bruck (1982), which included bilingual children with specific language impairments from English-speaking families who were enrolled in a French immersion school program. Bruck found that the children in the bilingual program performed similarly to children with specific language impairments in a monolingual English program on standardized tests of academic and language skills in English. Both groups of children achieved lower scores compared to bilingual and monolingual children without specific language impairments. Similarly, Paradis, Crago, and Rice (2003) found no significant difference between bilingual and monolingual children with specific language impairments in terms of the number and types of morphological errors commonly found in these children's languages.

The discrepancy between the findings of these studies and those found in Crutchley et al. (1997) is consistent with differences found for children with typical development across different types of settings. The children in the Bruck (1982) and Paradis et al. (2003) studies were in environments that actively promoted and maintained bilingualism, also referred to as additive bilingual environments (Bruck, 1982). For example, in Bruck's study, the children were from English-speaking homes and were enrolled in French immersion schools by choice. In Paradis et al.'s study, all of the children were from homes in which parents were using a one-parent-one-language strategy, which suggested a conscious investment in the transmission of both languages. In contrast, the children in Crutchley et al.'s study were exposed to minority languages at home and English-only at school, and maintenance of home language was not identified as an explicit goal either at school or at home. Typically, in a context such as this, children tend to make steady gains in the majority language, with skills in the home language declining over time, leading to a subtractive bilingual situation (Fishman, 2006; see Paradis et al. (2010) for a further discussion of additive and subtractive bilingualism).

The previously noted studies point to the fact that, for both children who are typically developing and those with communication disabilities, learning outcomes have less to do with the number of languages being learned than the conditions under which language is learned: the level of support for bilingualism at school and in the community, the quality of exposure to both languages, and the types of measures used to monitor language growth. The findings also highlight the fact that growing up bilingual is as much a sociocultural and sociopolitical experience as it is a linguistic one (Zentella, 1997). A purely child-focused psycholinguistic approach to understanding bilingualism would miss the many other complex ecological factors affecting the learning and development of bilingual children (Bronfenbrenner, 2005).

The literature in bilingual communication disorders suggests that children who are exposed to two languages may in fact benefit from a bilingual approach to intervention (e.g., Gutierrez-Clellen, 1999; Kohnert, 2010, 2013). There is no evidence to support the conclusion that bilingualism is confusing or too taxing on the language-learning abilities of children with communication disorders. The research available thus far clearly shows that mediation in the home language does not impair or significantly slow the learning of a second language. To the contrary, there is evidence that children can benefit from an intervention that acknowledges the home language and culture and supports bilingual development, with gains in both the majority language as well as the home language (Restrepo, Morgan, & Thompson, 2013).

A Sociocultural Approach to Bilingualism and AAC

In this paper, we propose the use of a sociocultural approach to serving children with AAC needs who live in bilingual environments. From a sociocultural perspective, language learning is rooted in children's participation in culturally meaningful activities (Thorne, 2000). It takes years of interaction with mature language users for children to attain adult-like skills. These interactions reflect the cultural values and social practices of those who speak the language. This theory argues that language use has a profound effect on children's development because language not only develops through participation in socio-cultural activities but also mediates participation (Martin, 2012).

The sociocultural theory of learning carries several important implications for children with AAC needs in bilingual environments. For example, because communication is a situated activity, children's ability to participate – regardless of the presence or absence of communicative disabilities – is dependent on access to the languages that mediate participation. In addition, children in bilingual environments are socialized through different languages so that they can understand the range of cultural meanings that are available across linguistic communities. They also draw on the linguistic resources available across languages in order to display a fluid array of cultural competencies that are expected of them (Garrett & Baquedano-Lopez, 2002; Ochs & Schieffelin, 1984). If we conceptualize language as a tool for contextualized meaning-making and not just an abstract mental system, then we are also able to recognize that the use of more than one language, rather than causing confusion, opens up opportunities for the child using AAC to achieve shared meaning. Moreover, given the importance of families and social networks in the provision of successful AAC intervention, the linguistic and cultural capital that they possess should be recognized and valued.

There is a convergence of opinions that educators and clinicians should support and work closely with families so that they can maintain and pass their linguistic and cultural heritage on to their children with and without disabilities (Artiles & Ortiz, 2002; Center for Applied Linguistics, 2005; Martin, 2012; Mueller, Singer, & Carranza, 2006; Waterman & Harry, 2008). Likewise, many consider that interventions for children with communication disabilities should be conducted in both the children's home and school languages, with an emphasis on the home language when it is the children's stronger language (Gutierrez-Clellen, 1999; Gutierrez-Clellen, et al., 2008; Kohnert, 2010, 2013; Kohnert, Yim, Nett, Kan, & Duran, 2005). The assertion to support two languages is based on not only the cognitive and social advantages that have been identified for typical children and adults, but also the evidence suggesting that, all things being equal, bilingual learners with disabilities are not at a greater disadvantage for language acquisition than their monolingual peers.

There are compelling reasons for the maintenance of the home language for children with complex communication needs. Failure to develop and implement an intervention plan that supports long-term development and maintenance of both languages for bilingual children will limit interpersonal interactions between family members, and natural opportunities to practice and generalize linguistic skills across contexts. As Kohnert (2013) points out, the recommendation to target only a single language for bilingual children with communication disorders takes language out of its social context and ignores its fundamental role as an enculturation tool. Not using the home language with a child with a disability can exacerbate the disability and marginalize him or her even further from family and community.

Language is not a finite resource, even for children with disabilities; rather, it is a dynamic system that is expanded with rich input and diverse opportunities for its use. Recommending that a family stop using the home language with a child with disabilities presumes that language use is a conscious choice. In many families, the decision to speak only one language with the child with communicative disabilities will significantly impact interaction dynamics. Family members may find it difficult to include the child in conversations, or for the child to maintain relationships with family members and friends who do not speak the targeted language (Wong-Fillmore, 2000). Family members may also find the practice of speaking only one language difficult to maintain. For example, in an interview study of bilingual parents of children with autism spectrum disorder, Yu (2013) found that many of the parents who committed to speaking only English with their children eventually went back to speaking bilingually or to speaking primarily Chinese. Even though each of the parents was proficient in English, they reported that there were things that they could not adequately communicate in that language alone. In some cases, it was because the ideas they wished to convey had no cultural or linguistic equivalents in English. Some spoke English exclusively at work and in other formal settings and found it difficult to speak English in domestic contexts and intimate situations. Others said it simply "felt unnatural." Parents who believed or were told that bilingualism was detrimental for their children felt guilty and viewed their inability to speak only English as a failure.

Although there has been an increase in research into issues related to bilingualism in children with communication disorders, very little attention has been directed toward issues concerning bilingualism for children with complex communication needs who require AAC. This gap has long been recognized as an urgent concern (Bridges, 2004; Bridges & Midgette, 2000; Huer & Saenz, 2002; Rossi & Balandin, 2005). Planning for intervention for children who live in bilingual communities presents additional challenges for professionals working in the area of AAC, as they will need to develop and support communication strategies and techniques that facilitate communication and language

development across the different languages and contexts in which the child using AAC participates.

Professional support for two languages does not necessarily mean that both languages must be supported at the same time, in the same way, or by the same interventionist (Kohnert, 2013). Rather, supporting two languages in a bilingual child who uses AAC means that the intervention plan will be consistent with the child's previous experiences as well as his or her current and future communication needs. A bilingual perspective accepts the child's communicative experiences and accumulated abilities with the family members as an essential resource on which to build. Therefore, an accurate assessment of a child's communicative ability is critical to designing an intervention plan that addresses the child's current and future needs.

Assessment Considerations

Identifying a child's true communicative abilities and needs in two languages is a challenge because there are very few bilingual measures and few bilingual professionals who can administer and interpret the results. Proficiency in any language is dependent on a number of factors, including age, intensity of exposure, and opportunities for use. AAC professionals should be aware of typical developmental patterns of language learning in both simultaneous and sequential bilingual children and how these may vary in children with disabilities, including those with complex communication needs (see Kohnert & Medina, 2009; Kohnert, 2010 for extensive reviews on language development patterns for children with communication disorders).

An additional consideration for assessment relates to the variability of languages and language proficiency among bilingual children with complex communication needs. The languages in a bilingual child's life are in many ways interwoven and inseparable and, at the same time, these languages may play highly specific roles across the different contexts of a child's life. Assessments that examine a child's languages separately or neglect the genre-specific nature of code choices, tend to underestimate competencies. For example, Bedore, Peña, García, and Cortez (2005) found that when bilingual children's performances on vocabulary tests were scored conceptually rather than monolingually – that is, when performances were analyzed and scored for the meaning of the responses regardless of the language in which they were produced – the participants achieved scores that were comparable to monolingual children. When their performances were scored monolingually, however, the scores for bilingual children were lower than those for monolingual children (see Bedore et al., 2005).

To minimize language bias, De Lamo et al. (2011) advocate for the use of a sociocultural approach to assess the communicative abilities of bilingual children with communicative disorders. This approach uses a combination of methods and data from multiple sources to evaluate developmental and clinical history, current level of achievement in both languages, and the ability of the child to learn or use language in a variety of contexts and with multiple communication partners (De Lamo et al., 2011; Gutierrez-Clellen & Peña, 2001; Kohnert, 2010; Langdon, 2008; Soto, 2012). The most informative combination of methods will change with the child's age, but in all cases, the methods must include (a) observations of the child in natural environments during interactions with peers and family members; (b) interviews with family members; (c) language samples; and (d) performance in language comprehension and production tasks at a variety of levels (e.g., single word vocabulary, words in discourse, morpho-syntax, figurative language and narrative) in all of the languages to which the child is exposed and within all interaction environments.

Collaborative Goal Setting

In a number of studies with culturally and linguistically diverse families, parents and other family members expressed appreciation for the use of AAC at school and recognized that the AAC system was critical to their child's social and academic participation, yet they did not convey any desire or need to use it at home. When asked to identify the reasons, parents mentioned a series of barriers to successful implementation of AAC strategies and techniques in the home, including (a) language intervention conducted only in the school language; (b) language and cultural barriers between parents and professionals; (c) communicative limitations of the AAC device; (d) irrelevant vocabulary; (e) culturally inappropriate symbols and messages; and (f) lack of culturally and linguistically accessible, family-centered instruction on how to use the device at home (Kemp & Parette, 2000; McCord & Soto, 2004; Pickl, 2011; Stuart & Parette, 2002). In a series of related studies, Parette and colleagues (cited in Bailey, Parette, Stoner, Angell, & Carroll, 2006) interviewed a total of 67 family members from diverse cultural and linguistic backgrounds and found that "(a) families across all ethnic groups want to be involved with professionals in AAC decision making; (b) families want more information, education, and training regarding AAC; and (c) ethnicity impacts decision making in AAC" (p. 51).

Prior to the introduction of an AAC system, the family of a child with complex communication needs will already have established patterns of communication. Understanding the existing interaction dynamics within a family is a critical element when recommending and designing AAC techniques and strategies (Parette, Brotherson, & Huer, 2000). In setting a culturally and linguistically responsive plan of action, professionals need to include the family's input about their preferred language and communication needs, views on the child's communicative disability, and level of involvement and participation with which they are comfortable. Cultural differences are likely to influence not only the roles that

the family members are willing and able to play in teaching their child but also those they expect professionals to fulfill (Hwa-Froelich & Vigil, 2004).

In order to make intervention relevant to any family, it is important to elicit family members' perceptions of meaningful intervention goals (McCord & Soto, 2004; Pickl, 2011). It is imperative that service providers reach out to family members to include their perspectives and create an open communication climate that would support an exchange of ideas. Professionals may need to schedule home visits in order to provide the family members with an opportunity to share their ideas and to observe the families' interactive routines (Stuart & Parette, 2002). During these visits, professionals who do not speak the family's language will need to use bilingual and bicultural interpreters that are able to indicate to families that they are valued members of the intervention team (See Hwa-Froelich & Vigil, 2004 and Kummerer, 2012 for excellent descriptions of issues and strategies for culturally respectful communication skills). Communication through an interpreter is a complicated task (Langdon, 2008). It slows down and changes the dynamics of communication, making conversations more cumbersome and prone to misinterpretation by both parties. It also deprives family members of the privacy they may need to discuss their family member's needs. Service providers must recognize and be sensitive to these difficulties. In order for interpreters to be effective, they must be proficient in both the language of the family and that of the professional, and able to understand and appreciate the subtle cultural nuances of meaning for each party. In addition, interpreters should understand the relevant professional jargon and the clinical/educational processes involved in the event for which they are providing services (Seal, 2000).

Given the lack of fully qualified bilingual/bicultural interpreters, professionals may need to rely on bilingual family members or family friends to act as interpreters. While at times this may be the only option available, using non-professional interpreters adds a layer of complexity to the interaction. Difficulties may arise from role conflicts, a lack of training, and a lack of knowledge of the issues being discussed. In addition, family members may feel embarrassed to discuss intimate matters with other family members or friends. In turn, the interpreter may censor or change what is being disclosed to minimize family exposure or shame.

Intervention Considerations for Bilingual Children

The ultimate purpose of AAC intervention is to help children reach their full potential as communicators and maximize their participation in their communities (e.g., social, academic, and occupational/vocational). AAC professionals serving bilingual children may or may not share the languages of their families. Sometimes, bilingual professionals provide intervention to bilingual children with whom they share both languages. More often than not, there will be a mismatch between the languages spoken by the professional and the child. Although it is essential to increase the number of bilingual clinical professionals, the mismatch between clients and professionals will likely persist in the future. As Kohnert (2013) indicates, the key issue is to identify ways in which interventionists can facilitate language development of a language they do not speak.

Bilingual intervention may include direct systematic teaching of certain forms and functions implemented by professionals and indirect intervention through collaboration with parents and family members, peers and others to be supportive communication partners (Kent-Walsh & McNaughton, 2005; Kohnert, 2010). Strengthening skills in a child's home language will necessarily involve other individuals who share similar cultural and language experiences as the child. Kohnert (2013) describes at length collaborative strategies to facilitate development of home language by coaching parents, peers and paraprofessionals to implement language facilitation strategies. The term "coaching" connotes helping parents towards their own goals, rather than training them to perform some pre-determined tasks.

To date there are no published studies documenting clinical or educational approaches with bilingual children who use AAC. In the absence of direct evidence, AAC professionals will have to draw principles and strategies from related disciplines such as bilingual special education (e.g., Mueller et al., 2006) and bilingual intervention for children with language disorders (e.g., Thordardottir, 2010). These include (a) working with family and community members to reinforce learning across the home, community, and school; (b) understanding and supporting the gradual process of second language acquisition; and (c) acknowledging that second language learning is not helped by an eradication of the first language but rather is built on a strong foundation of first language and culture (Artiles & Ortiz, 2002; Kohnert, 2010; Langdon, 2008). Further investigation is critically needed to explore fundamental questions regarding the most effective strategies to improve the communicative competence of children who use AAC and live in bilingual communities.

AAC Implementation at Home

All families promote their cultural values through child socialization practices and social interactions (Hwa-Froelich & Vigil, 2004). Family roles and obligations are taught and manifested specifically through language as well as nonverbal behaviors. To increase involvement of culturally and linguistically diverse families, professionals should design communication systems that are reflective of the family's cultural values and inclusive of their linguistic practices, and model the use of AAC in communicative contexts that are culturally appropriate and increase the child's affiliation (i.e., belonging) with the family and community.

As previously noted, there are many factors that can impact the use of AAC at home, including socio-economics, language and educational barriers, conflicting cultural values, and mismatched expectations between families and professionals (see Bailey et al., 2006; Binger, Kent-Walsh, Berens, Del Campo & Rivera, 2008; McCord & Soto, 2004; Pickl, 2011). Sometimes, professionals may misinterpret the reasons why the family does not use AAC at home, and may even feel that parents themselves, including their language and their cultural practices, are impediments to the successful use of the system; they may not understand the underlying cultural or socio-economic dynamics and judge the families' behavior as unengaged or uncooperative.

A clear understanding of the family members' values and beliefs regarding AAC can help create a more respectful relationship regarding the implementation of recommendations. Often, parents complain that working on AAC skills with their children feels too much like "therapy" or "homework." For instance, professionals may suggest a range of strategies to enhance the child's communication at home (e.g., encouraging requests, offering choices, engaging in dialogic book reading), but these may require parents to modify the ways in which they already interact with their child. Parents may not see the need to use any communication aid to achieve communication purposes that they are able to meet successfully without the interference of a "machine" (McCord & Soto, 2004). Instead of assuming that AAC will be helpful to the family, professionals should ask the parents about communicative situations in which they wish their child could participate and target those situations as contexts for intervention.

Parents have been found to be supportive of interventions that are embedded within the family's natural milieu (Kummerer, 2012; Kummerer & Lopez-Reyna, 2006; Nunes & Hanline, 2007). To that end, professionals should consider activities that build on what parents know and already do, for instance, helping them use AAC techniques in the context of playing with a younger child or having a personally meaningful conversation with an older child. Further investigation is needed to explore the range of interactive contexts that are favored by families across different cultures for communication and language intervention.

Selection and Customization of Bilingual AAC Systems

Family members often express frustration at the fact that AAC systems do not include their home languages or vocabulary that is relevant and functional in the home (McCord & Soto, 2004; Pickl, 2011). Thus, a main challenge AAC professionals face when serving bilingual children is the development of a communication system in a language they may not speak or understand. In creating a bilingual AAC system, it is not enough to simply translate the same vocabulary into a different language; a truly bilingual AAC system would reflect the way children learn and use each language in different communities. As Yong (2006) indicates, an understanding of the underlying structure of the target language is essential to the development of an AAC system. Two different languages may require different modalities, different vocabulary and vocabulary layouts, different representations, and different grammars (e.g., Baker & Chang, 2006; Nakamura, Iwabuchi, & Alm, 2006).

In a study designed to compare intervention outcomes for two individuals learning different AAC systems in two different languages (English and Mandarin), Yong (2006) noted that different grammars often required using different motor planning for access, different teaching strategies, and different clinical intervention materials. In a related study, Nakamura et al. (2006) compared how Japanese and English speakers formulate and interpret picture-based sentences. They concluded that English speakers used word order as the main cue while the Japanese speakers required the use of grammatical markers to understand sentence structure. Clearly, the development of bilingual AAC systems will require a deep understanding of the two languages and their pattern of development (see Andres, 2006 and Baker & Chang, 2006 for an overview of foundational issues involved in the development of an AAC system for Mandarin). Bilingual systems should also be designed in such a way that the child could easily code-switch between languages as needed. Further research into strategies to scaffold language development and code switching for bilingual children who use AAC is critically needed.

To make the AAC device truly relevant to the family, AAC systems should include not only the home language but also representations that incorporate glosses, designs, colors, and referents that are compatible with the home culture and represent vocabulary that is functional and culturally valued (Andres, 2006). Existing studies point to differences in how individuals from different cultures rate the iconicity of different symbol sets (e.g., Bornman, Alant, & Du Preez, 2009; Huer, 2000). This has led to the development of indigenous AAC systems in several countries, most notably in China (Andres, 2006) and India (Bhattacharya & Basu, 2009).

Conclusion

Serving the AAC needs of bilingual children presents a number of challenges to professionals. The evidence base in this critical area remains sparse and therefore the considerations presented in this paper are merely suggestive and largely speculative. We have put forth an argument for a sociocultural approach to serving children with AAC needs who live in bilingual communities. This argument is motivated by the preservation of cultural and linguistic heritages, the promotion of positive regard for minority languages and linguistic diversity, and emerging evidence of the benefits of bilingual interventions for children with communication disorders.

We also raise a number of key issues pertaining to culturally and linguistically responsive service delivery in the areas of assessment and intervention, including the selection and customization of bilingual AAC systems. Across these areas of concern, we highlight the need for using assessment and intervention strategies that meet the unique needs of bilingual children and families. A socio-cultural approach can be used to understand the needs and perspectives of bilingual children and their families throughout the service delivery process. In addition, professionals must be knowledgeable about the unique learning and development trajectories of bilingual children. The use of bilingual strategies is crucial for assessment and intervention, even when their implementation must be mediated by interpreters and other adults who act as cultural liaisons. Both the examination of bilingual children's competencies in the assessment stage, and the development of new skills in the intervention stage, need to be considered in the context of cultural practices that are meaningful to the children's families and communities of membership.

Barriers that continue to impede culturally and linguistically responsive service delivery for bilingual children who use AAC also need to be addressed. For example, the lack of diversity among professionals serving children with complex communication needs, and especially the insufficient numbers of bilingual professionals, makes it difficult for children to access service providers who have a deep knowledge of their communication needs. In addition, there continues to be a critical need for high quality personnel preparation to help both monolingual and bilingual practitioners gain relevant knowledge and skills in the delivery of culturally competent services. Because of the complexities involved in meeting the needs of clients across diverse communities, there must also be systemic and sustained structural and administrative supports for service delivery, including increased time for collaboration and service coordination.

We hope that the information offered and the positions taken in this paper serve to engage AAC practitioners and researchers in more in-depth discussions about culturally and linguistically responsive service delivery as it pertains to bilingual children with AAC needs. We also hope to stimulate further conversations about the actions that might be taken across professional and academic communities in AAC to realize the aspirations for high-quality service provision for this growing population of clients. Further investigation is critically needed in order to advance our understanding and improve practice, in particular with regard to the implications of bilingualism for system design and customization; and with respect to the development of effective strategies to scaffold language for children who use AAC and live in bilingual communities. Future research into the effectiveness of a variety of direct and indirect intervention strategies is needed. In addition, to improve intervention efficacy with bilingual children who use AAC, it is essential to understand factors that promote or constrain generalization of skills within and across languages.

In the absence of evidence-based practice in this largely unexplored area, one way to proceed would be to first identify professionals who are successful at working effectively with parents and children who use AAC and live in bilingual communities. Systematic analysis of their practices might help identify the skill sets professionals need to learn to effectively scaffold communication and language development in two languages meditated by AAC. We encourage all practitioners who work with children from bilingual backgrounds to contribute practice-based evidence and inform a research agenda. Practitioners can complete carefully crafted case studies documenting the challenges, procedures, and outcomes of bilingual interventions. This type of sharing could prove to be a valuable resource to professionals and could serve as a stimulus for the establishment of a rigorous research agenda.

Author Note

We would like to thank Janice Light, Mats Granlund, and the three reviewers for their helpful suggestions during the review process of this manuscript.

Declaration of interest: The authors report no conflicts of interests. The authors alone are responsible for the content and writing of this paper.

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