

Critical Review:

In bilingual children using augmentative and alternative communication, what factors influence successful communication intervention?

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Previous research indicates that best practice for bilingual children involves inclusion of the home language and culture in intervention. For users of augmentative and alternative communication (AAC), access to both languages can foster interaction with family and community, contributing to generalization across settings. This critical review examined published literature to identify the factors that influence successful communication intervention for bilingual children using AAC. A literature search of computerized databases resulted in five qualitative research articles. Three main themes emerged within the literature: factors within the provision of family-centred care, knowledge of the professionals involved with the child and family, and practical considerations. There is suggestive evidence that these factors influence the success of communication intervention in bilingual children using AAC and are therefore important clinical considerations for speech-language pathologists working with the population. Further research to measure the impact of these factors directly on intervention outcomes is needed to build upon the foundation presented here.

Introduction

Speech-language pathologists around the world face the challenge of providing educational and clinical services to children from culturally and linguistically diverse backgrounds. While little research has focused on bilingual children who require augmentative and alternative communication (AAC) devices, it is clear that there are additional barriers that are faced by clinicians working with these children; these relate specifically to the selection, customization, and implementation of AAC strategies (Soto & Yu, 2014).

Despite these additional challenges, for bilingual children with communication disorders, it is suggested that intervention acknowledging the home language and culture, and which supports bilingual development, can be beneficial and result in gains in both primary and secondary language (Gutierrez-Clellen, 1999; Kohnert, 2010). This follows a wealth of research indicating no significant differences between bilingual children with specific language impairments or complex communication needs and their monolingual counterparts (Bird et al., 2005; Petersen, Marinova-Todd, & Miranda, 2012); learning multiple languages is not too taxing for the language-learning system of children with communication disorders and these children can, in fact, utilize skills within their first language to facilitate the acquisition of their second language (Soto & Yu, 2014). Furthermore, research indicates that a bilingual intervention approach supports a host of positive outcomes such as improved social and emotional health (Rolstad, Mahoney, & Glass, 2005), and better cognitive and academic gains (Kohnert,

2010). Yet many parents and professionals remain reluctant to speak more than one language to children with communication disorders and professional services are often delivered in the socially dominant language, namely English (Soto & Yu, 2014).

For AAC users, their second language provides the opportunity to express themselves with additional vocabulary and language in a range of settings (Clarke & Senner, 2018). Language, when viewed with the sociocultural approach, has a vast impact on children's development not only because it develops in socio-cultural activities, but because it also mediates participation in these very activities (Soto & Yu, 2014). Implementing an intervention plan that supports bilingual development and maintenance fosters interpersonal interactions between family and other members of the community, contributing not only to natural opportunities to practice and generalize skills across settings, but to ensuring the child's disability is not exacerbated and they are not further marginalized from family and community (Soto & Yu, 2014).

There are multiple advantages to supporting bilingualism and research indicates benefits rather than disadvantages to supporting bilingual language development in children with specific language impairment and disability (when taking social and environmental factors into account). It has become apparent, then, that promoting a child's language and augmentative communication in both their primary language and the language of their home and/or community is best practice for clinicians. It is thus important to clarify the factors that influence successful communication intervention in this

population, such that clinicians can overcome the present barriers and best serve the needs of bilingual children using AAC.

Objectives

The objective of this paper is to critically evaluate existing literature regarding the factors that influence successful communication intervention in bilingual children using augmentative and alternative communication.

Methods

Search Strategy

A variety of computerized databases, including Pubmed, Google Scholar, and Western's Library database, were searched using the following terms: (augmentative alternative communication) OR (AAC) AND (bilingual*) AND (children) AND (language intervention). Reference lists of selected articles were searched to obtain additional relevant articles.

Selection Criteria

To meet inclusion criteria, articles were required to be peer-reviewed, in English, and published during or after the year 2000. They were required to include participants who were or provided service to bilingual children, adolescents and/or their families who use AAC systems or devices, or to have discussed the implications for such populations. Expert focuses were excluded in order to narrow the focus of the present paper.

Data Collection

Results of the search yielded the following: one review paper, two qualitative research studies, and two observational studies.

Results

Informational reviews of the literature

Review papers can provide a good starting point as they integrate and synthesize research from a variety of key references to provide a snapshot of a particular area. However, they do not always provide thorough detail regarding the weighting of evidence or the inclusion criteria and should therefore be interpreted with caution.

Parette and Huer (2002) outlined how the values of Asian American families may differ from those of Euro-American families, describing how these may influence the family's involvement in the team decision-making process and AAC interventions.

They discussed that due to differences in (a) perspectives on disability, health care, family life, and education/intervention, (b) communication styles, and (c) reactions to AAC, practitioners need to establish a basis of trust and may need to use family support groups or respected members of the community to act as liaisons in order to address the cultural and linguistic factors at play. Specific suggestions were provided (with logical rationale) on how to best implement intervention with these cultural considerations in mind, however there was little evidence provided to support these suggestions.

This article provides a well-organized summary of the literature regarding the cultural values of Asian American families and somewhat suggestive evidence of their impact on AAC intervention. However, with little research support and no critical analysis of the research referenced throughout the paper, this article provides limited evidence on the factors influencing service delivery for bilingual children using AAC.

Qualitative research

This research is a form of scientific inquiry that seeks to describe and inform the researcher's understanding of a social or cultural phenomenon (Prashant & Astalin, 2013). One commonly used qualitative research design is ground theory, which aids in the systematic collection and analysis of data to make connections and formulate new theories not predetermined prior to commencing the research (Prashant & Astalin, 2013).

Pickl (2011) explored facilitators and barriers to the provision of service in children with severe disabilities and complex communication needs whose home language differs from the language used in school. Data were collected through classroom observations, informal personal conversations, e-mail discussions, memos, and semi-structured interviews with 12 caregivers and 24 special education teachers who discussed their involvement with 43 children with complex communication needs. Data was coded and analyzed concurrently according to grounded theory; using the constant comparative method, similarities and differences within the data were identified, categorized, and organized into coding paradigms. Results revealed six major categories critical to effective communication intervention in the population, with the quality of parent-teacher-interaction being of central importance.

This study's strong qualitative design meets many of the criteria posited by Tracy (2010) regarding excellence in qualitative research. It addressed a relevant and significant topic with sufficient detail regarding the theoretical constructs on which it was based, an abundance of data, and transparent data collection and analysis procedures. The study achieved credibility through crystallization, with competent special education teachers and speech-language pathologists confirming the statements made by interviewees. While grounded theory does introduce opportunity for influence by the researcher, the author's self-reflexivity about her potential biases and inclinations as well as the transparency of the methods appropriately mitigates this risk. Limitations of the study include a small sample size of parent interviewees and lack of generalizability due to the recruitment of only children in specialized classrooms. Results provide highly suggestive evidence that classroom situation, teachers' interest and expertise, communication aids, family attitudes, and parent-teacher interaction are important components of effective communication intervention for children with complex communication needs.

Tönsing, Niekerk, Schlünz, and Wilken (2018) held focus groups with purposefully chosen AAC providers (n = 15) in South Africa to investigate the current provision of AAC service to clients from multilingual backgrounds and to describe how this service is influenced by the possibilities and limitations of available AAC systems. Participants gave their input on three themes and after transcription, the first author coded the text by means of an inductive descriptive coding process. The coding scheme, themes and subthemes were then refined by consensus. Analysis revealed the limitations of AAC technology were important factors influencing practice, as were the language context of the area, the clinician's own knowledge and orientation towards multilingual AAC service delivery, and client and family choices.

This study investigated a relevant and timely topic with an appropriate study design. They did not focus specifically on the provision of service to children, however their caseloads were 75% children on average. They achieved sincerity, as described by Tracy (2010), through the transparency of their methods and made a practically and morally significant contribution to the field. Weaknesses of the study include a small sample size that overly represented persons from specific language backgrounds, which limited the ability for generalization. The study did include a form of member reflection but had limited credibility due to

its lack of crystallization and multivocality. Only one author developed the coding scheme and themes, thus the trustworthiness of the data was impacted and rich rigor was not achieved (Tracy, 2010). When the limitations are considered, this study provided suggestive evidence on a variety of factors influencing the provision of AAC intervention to bilingual children.

Observational studies

These types of qualitative research studies are those in which participants are observed and some aspect(s) of their behaviour is recorded, with no researcher interference or manipulation to any of the variables. As a form of qualitative research, they generally aim to describe or understand a particular phenomenon. As variables are not controlled, conclusions from this type of research can be limited but can nonetheless provide an informed starting point for further research.

Boenisch and Soto (2015) conducted an observational research study to identify and investigate differences in the core vocabulary of typically developing school-aged children (ages 7-14) who are native English speakers (n = 22) and who speak English as a second language (ESL, n = 8). Children were equipped with digital audio recorders over several weeks, during two different consecutive typical school activities for between one-three hours, totalling 65 hours. LingoFox™ was used to analyze the transcripts. Results revealed ESL speakers had an overall smaller vocabulary but that there was a relatively high percentage of overlap between the 100 most frequently used words by each group of speakers. The 100 most frequently used words were made up largely of function versus content words for both groups.

Strengths of this study include a robust rationale, appropriately detailed methodology surrounding participant demographics and data collection, appropriate data analysis, and strong inter-rater reliability. This study lacked detail on some aspects of data analysis, namely how core vocabulary words were determined. This study's small sample size and type of sample also limited the ability to make strong comparisons between groups and to generalize to children with disabilities. Results of the study provide suggestive evidence that core vocabulary is not markedly different between children with different language learning experiences and therefore need not be considered differently for bilingual children with AAC needs.

Robillard, Mayer-Crittenden, Minor-Corriveau, and Bélanger (2014) conducted an observational research study to examine possible differences in the core vocabulary of monolingual (French, $n = 6$) and bilingual children (French-dominant, $n = 22$; English-dominant $n = 19$) and children with primary language impairment (PLI) (French-dominant, $n = 3$; English-dominant, $n = 7$). The study aimed to inform vocabulary selection for children with complex communication needs. Children wore a digital voice recorder from the time they arrived at school until the last bell, with the exception of gym and recess, and transcripts were then analyzed by the Systematic Analysis of Language Transcripts (SALT) software. No important differences were found between the core words of the four groups studied.

Strengths of this study include a thorough rationale and appropriate design, well-detailed methodology, and appropriate data analysis. This study lacked strong inter-rater reliability, however this was attributed to the environment in which the data was collected. This study was limited by the small sample size of each group, particularly the monolingual and PLI groups. Despite these limitations, results provide highly suggestive evidence that the same core vocabulary can be provided for AAC systems used by children who are monolingual or bilingual and have language impairments.

Discussion

The research revealed a variety of factors that may have an influence on the success of intervention in bilingual children using AAC. The presented study identified three main themes into which the factors tended to fall. These were factors involved in the provision of family-centred care, knowledge of the professionals involved with the child and family, and practical considerations.

Several articles highlighted the need for family-centred care. Parette and Huer (2002) discussed the views and perspectives of clients and how these may impact a positive and effective client/family-professional relationship. Similarly, they discussed how the culture and values of a client and their family may play a role in their communication style, an important consideration for service providers as they aim to collaborate with families to provide targeted intervention for their clients. In this article and Pickl's 2011 article, the family culture and associated attitudes towards intervention, the families role as a collaborator in care, and their views on disability in general were all indicated as important

factors for professionals to best understand the lives and needs of their clients and families, and to then provide the most appropriate service. Families of bilingual children will often be immersed in culture and values different from those of the providers, thus it is important to reflect knowledge of the clients culture in the intervention provided. Pickl (2011) discovered that, while a variety of factors were indicated, most important to the child's success was the parent-teacher interaction, which was highly influenced by the teacher being aware of the families perspectives and values as well as the family having an understanding of their expected role within their child's learning.

Tönsing, Niekerk, Schlünz, and Wilken (2018) identified similar factors when service providers brought up the choices of the client and family, which were largely impacted by their culture and perspectives; often, though the language of the area may have been different, these families chose for English to be the main or only language of intervention because they perceived it to be best for their child's success. Service providers also indicated that, in an area with such a variety of languages, it was important for them to have knowledge of the language most commonly used in the home and community so that they could prepare the child to communicate in a variety of environments. Having an understanding of these types of perspectives, especially how they are influenced by culture, appears to be most important when providing effective intervention to children from diverse cultural and linguistic backgrounds.

The second theme that emerged was knowledge of the professionals involved in the intervention and care of the child. Pickl (2011), speaking with special education teachers and the caregivers of bilingual children whose home language is different than the school language, determined that the expertise of the teacher both in teaching children with disability and with AAC, was important to families and teachers alike (who indicated that they regretted the limited training they had received in AAC in particular). The role of a speech-language pathologist often includes working with teachers, thus an important consideration appears to be ensuring adequate training of related professionals such that they can be confident, competent collaborators of AAC intervention. Pickl also discovered that the knowledge and interest of the teachers in the child's home culture and language fostered a positive parent-teacher relationship and contributed to learning and communication opportunities within the classroom. While speech-language pathologists should consider

these factors related to the teachers working with their clients, an important consideration when considering the time children spend in the classroom setting, Tönsing, Niekerk, Schlünz, and Wilken (2018) indicated the importance of the clinician's own skills and orientation towards multilingual AAC use. While most clinicians recognized that best practice is to incorporate both languages into intervention and that this is not too taxing for bilingual children with disabilities, it was still the case that many did not follow through with bilingual language intervention for a variety of reasons. Being cognizant of one's own skill, biases, and practices are important when providing intervention to bilingual children using AAC.

Finally, across nearly all studies, multiple practical considerations were identified. The size and set-up of the classroom as well as the types of communication aides themselves impacted teachers ability to implement effective communication with AAC (Pickl, 2011). Tönsing, Niekerk, Schlünz, and Wilken (2018) further discussed the limitations of the technology: in South Africa, with 11 official languages, they were limited by the pre-programmed vocabulary and voice output (largely in English), the inability of most devices to easily code-switch between languages, as well as the symbols used within apps and systems (often culturally inappropriate). All of these practical factors are therefore indicated as important considerations for clinicians worldwide when looking to provide AAC intervention in multiple languages. Interestingly, both Boenisch and Soto (2015) and Robillard, Mayer-Crittenden, Minor-Corriveau, and Bélanger (2014) found no important differences in the core vocabulary of monolingual and bilingual children, even with primary language impairment, suggesting that vocabulary selection is not a differential consideration for bilingual children using AAC as compared to their monolingual counterparts.

While the presented qualitative research studies did not include how these factors related to direct outcome measures of a given intervention, the factors were mainly highlighted by families, special education teachers, and service providers involved with this population. They spoke to the impact of these factors on the relationships between family and professionals and their ability to use AAC with the children, which may indicate their importance in the outcomes of language intervention as a whole.

Recommendations

The findings of this study should be understood with consideration of the limitations inherent to the qualitative research that was included. While the above themes were revealed within the literature, their direct impact on successful communication intervention has not yet been elucidated. The qualitative research appraised within this paper provides a foundation on which to base gold standard investigation regarding what factors might be related to successful outcomes from a given intervention. Furthermore, it would be important for such research to parse out the cultural factors that have an impact on this success.

Clinical Implications

While future research is required to clarify the impact that these factors may have on successful intervention, the studies presented in this paper provide suggestive evidence that three main themes are important to consider during the provision of service to bilingual children using AAC.

First and foremost, as language is so closely interwoven with culture, clinicians must look to provide client and family-centered care through an understanding of the culture, values, and customs of their clients, which can impact their language choice as well as their role in team decision-making. This may include factors such perspectives of disability, healthcare professionals, AAC intervention, and the role of the family; communication styles; and the language contexts of the community and school in which the child participates. To gain this insight, it may be necessary to involve trusted members of the community and/or extended family members, and translators where necessary.

A clinician must also consider themselves and the other professionals, such as teachers, that are involved with the client as the skills and knowledge of the team will be important factors for consideration. This may include their proficiency in the languages of the client, their own orientation towards giving access to multiple languages, and their level of expertise in AAC. It will be important for clinicians to have awareness of and to fill in gaps in their own knowledge where necessary, as well as to collaborate closely with other professionals to ensure intervention is carried out seamlessly across all language contexts for the child.

Finally, there are some practical considerations to keep in mind. While vocabulary does not appear to be a differential consideration for bilingual children using AAC, limitations to technology itself are. This includes lack of software with vocabulary or synthetic voices in languages other than English, inability to easily code-switch, or culturally inappropriate symbols. Clinicians should seek out available research on the appropriate symbols for their clients and work to find the AAC system or device that will best fit their client's communication needs.

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