**Critical Review: The Quality of Social Interaction of Augmentative and Alternative
Communicators and the Factors that Impact it**

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This critical literature review examines the factors that impact the social interaction of augmentative and alternative communication (AAC) users and the quality of their interactions. Study designs reviewed included: randomized clinical trials (3), qualitative research (1), single group pre-posttest (1). Factors were identified that impact the quality of interaction as they effect the attitude of the conversation partner towards the AAC user. Such factors include: a device having voice output, gender and age differences of the conversation partner, etc. SLPs are recommended to encouraged to evaluate the success of a device based on its functional use, encourage multi-modal communication, as well as to incorporate peer modeling into therapy.

Introduction

Communication plays a central role in the lives of human beings. It acts as a means to express essential needs, personal opinions, to protest and to develop and maintain relationships. Developing social networks is essential to negotiating and sharing life with others. Mcnaughton and Nelson Bryen (as cited in Okolo and Bouck, 2007) noted that it has been found that AAC users have limited social networks. Developing these networks is a primary concern to AAC users.

For individuals that cannot communicate verbally, other methods need to be pursued. For non-verbal communicators, speech language pathologists, along with other team members, assess each client's individual strengths and weaknesses and select the most appropriate mode of AAC system. Alm and Newell (as cited in Loncke, Clibbens, Arvidson, and Lloyd, 1999) noted that 'A person's very concept of self is bound up with their social persona which is projected out to the world through each day, through interacting with a wide variety of people (p. 249).

AAC is defined as "the supplementation or replacement of natural speech and/or writing using aided and/or unaided symbols. Bliss symbols, pictographs, sigsymbols, tangible symbols, and electronically produced speech are examples of aided symbols. Manual signs, gestures, and fingerspelling are examples of unaided symbols. The use of aided symbols requires a transmission device, whereas the use of unaided symbols requires only the body" (Lloyd, Fuller, and Arvidson, 1997). Some AAC users need to use multiple modes of communication to meet all of their communicative needs (Johnston, McDonnell, Nelson and Magnavito, 2003). The use of different modes may be related to the communication environment or the needs of the communication partner.

There are multiple factors that may contribute to AAC users ability to develop and maintain social networks. Some of these factors are within the control of the AAC user, family members and professionals, while some are out of their control. People who use AAC have to experience success with their device and independent access to build relationships with others. When adult AAC users are asked to evaluate the importance of various abilities such as mobility, vocation, communication, etc., relationships and communication are often identified as most important (Loncke et al., 1999).

Objectives

Critically evaluating research regarding the quality of social interactions of AAC users and the factors that influence it is the primary objective of this paper. The secondary objective is to provide evidence-based practice recommendations regarding improving the quality of social interactions of AAC users.

Methods

Search Strategy

Computerized databases including Proquest - Education, Medline - Ovid, were searched using the following term(s):
((social interaction with) OR (communication interaction)) AND ((augmentative and alternative communication users) OR (AAC) OR (AAC user) OR (AAC device)) AND ((social behaviour) OR (social isolation) OR (social

adjustment) OR (social facilitation) OR (social identification))

The search was not limited by date in attempts to find as much relevant literature as possible. As well, The University of Western Ontario Library catalogue was searched for other relevant resources. Finally, other applicable studies were obtained from the reference lists of previously searched articles.

Selection Criteria

Studies included in this literature review were required to have examined the quality of social interaction of AAC users and/or the factors that impact it. There were no limitations in terms of research participants, research designs, type of AAC system or outcome measures.

Data Collection

Results from the literature search produced qualitative and quantitative studies fitting the selection criteria.

Results

Single Group Pre-Posttest:

Johnston et al. (2003) observed three preschool children with disabilities that were being taught functional communication using an AAC system. Each child had his/her/their own Individualized Education Plan (IEP). The children were 3:3, 3;10, and 4:6. Intervention was provided during daily activities within the preschool classroom. The intervention included 4-steps: 1. establishment of communicative opportunities, 2. model of the desired behaviour by a teacher or peer, 3. guidance to engage the child in the desired behaviour, and 4. consequences and comments provided by interventionist regarding the child's ability to produce the desired behaviour. When the child had achieved >90% accuracy for the desired behaviour, maintenance and generalization probes were conducted.

The findings from this study suggest that peer modeling prior to teacher prompts could increase the participants' likelihood of imitating or interacting with peers. The researchers put forth the idea that some children may be able to speak during some activities but their speech is not functional during others. For example, two of the children in

this study could speak but the volume of their speech was not adequate for noisy activities, therefore requiring an AAC device. The authors suggest that children in this type of situation need to learn to discriminate when their AAC device is needed and when it is not. Having a multi-modal communication style provides children with various ways to communicate with different people and in different places.

During snack time observation, most of the interactions were teacher-child with limited amount of child-child interactions. Post hoc examinations were completed and showed that the interventionist provided the majority of the models. The authors suggested that if there were a higher occurrence of peer models, there might have been an increase in child-child interactions.

Randomized Clinical Trial:

Tirabasso (1995) conducted a study, in which two groups of participants were told about an AAC user and how her communication device was used. Both groups watched a videotape of either a voice output device or a word based communication board. Both conversations were of the same content. The participants were then asked to rate the AAC users communication competence.

A one-way anova was used to examine the effect of type of AAC device used on each area of communicative competence. The voice output device was rated significantly higher for socio-relational and linguistic competence.

The researcher noted that when using a low tech device such as the communication board, it may require the conversation partner to be more involved in facilitating and co-constructing the user's messages compared to the voice output device. This results in the AAC user appearing as more of a passive participant in conversation, which leads conversational partners to perceive them as less willing to interact.

Major (1994) studied the effect of information on the perceived communicative competence of augmentative and alternative communication users. The study was comprised of three groups of participants who watched a video recording of an individual using a voice output device. Before viewing the video, the three groups received information from different people. One group received information from a speech-language

pathologist, another received information from the AAC user, and the other received no information.

The group that received information from the AAC user rated communicative competence higher. The results from this study suggest that AAC intervention should incorporate teaching the AAC user to provide information to their conversational partner about themselves and their device.

Lilienfeld and Alant (2002) researched the attitudes of 115 children aged 11-13 years, toward an unfamiliar peer using an AAC device with and without voice output. The children were randomly split into 2 groups matched for age, gender and academic achievement. One group watched a video of an AAC user using a device with voice output while the other group watched a similar video with the exception of the AAC device not having voice output. After the video, all students filled out the Communication Aid/Device Attitudinal Questionnaire (CADAQ).

Attitudes were evaluated on three factors: affective/behavioural, cognitive/belief, and communicative competence. The presence of voice output was significantly more favourable and overall girls' attitudes from both groups were more positive than boys. Item analysis revealed good internal consistency of the CADAQ.

O'Keefe, Brown, and Schuller (as cited in Lilienfeld & Alant, 2002) found that AAC users are more likely to receive a favourable response from peers when their messages are highly intelligible; socially appropriate; and reflective of users' intelligence, age, and gender. Voice output offers the ease of understanding messages produced in a familiar modality (ie. speech). Voice output offers the AAC user the ability to express their personality and sense of humour, to approach strangers, and improves self-confidence and self-image (p. 91).

Lilienfeld and Alant (2002) noted that it appears that adults may respond more positively to AAC users whose device is equipped with voice output. Research reveals that this may not be the case with children. Multiple studies show that children's attitudes towards their AAC user peer are not impacted by physical status or AAC technique. With regard to impact of gender, findings are inconsistent. Studies have shown that girls have more positive attitudes, that boys are more positive, and that both genders respond equally as favourably. In addition, attitudes of both boys and girls become less favourable as the children grow older.

Qualitative Research:

Anderson (1999) examined what barriers prevent effective use of written augmentative communication in the classroom. Two individuals were observed six times over a one-month period. The two participants were 9 and 10 years old. Observations were made about the participants' characteristics, the social and physical environmental contexts where they used written communication, and the type of activity being completed.

Observations revealed numerous barriers preventing the participants from increased social interaction. Both participants experienced few interactions with peers where the peer initiated the interaction. One participant was isolated from her classmates in her regular classroom, while the other was unable to attend music class with her classmates due to no wheelchair access to the second floor. Both participants sat above their peers during circle time. One participant had a broad social environment and was included in majority of class activities where the other participant was often excluded as a result of the teacher. This participant's interaction with the teacher was quite limited. One participant was able to complete all tasks with minimal modification, although speed and accuracy of typing decreased her writing efficiency. The other participant was limited in the variety of tasks completed and spelling was the focus. There was little time allotted for this participant to develop creative thoughts and to learn to make sentences, which hinders communication.

In the book, Communication augmentation: A casebook of clinical management, a young woman comments on the voice output feature on an AAC device.

"I didn't realize what a good idea speech would be. I find it next to impossible to get people to read the tapes and even when they do look at the tape, they don't read closely enough. I also have a blind friend I would spend more time with if the system could talk (pg 38)."

This young woman was unable to use her device frequently for face-to-face interactions. This was due to various reasons: conversation partners could not face her because the device screen would not be visible to them, inability to switch between messages because she was unable to store messages, and both the rate of message preparation and printed output interfered with the potential for communication.

Book/Expert:

Within the text Augmentative and Alternative Communication: New Directions in Research and Practice (1999), it was noted that family members consistently report that they felt it was easier to communicate on behalf of their family member that uses AAC rather than waiting for the AAC user to use their system to speak for themselves. It is suggested that this is a result of the busy family schedule. It is often found that the oldest sibling or the sibling closest in age to the child that uses AAC acts as a mentor and interpreter.

The authors put forth the factor of acceptance as a barrier to social interaction for AAC users. The example used was grandparents. If the grandparents are able to accept the child's disability, there is greater chance that social interaction will be increased. This may be generalized to all individuals. Conversational partners that accept the AAC user increase the amount and quality of social interaction.

Sweeney (as cited in Loncke et al., 1999) conducted a study of children 8 to 12 years of age who use AAC or had severely dysarthric speech. The study revealed that none of the children interviewed indicated that all of their family members understood them and few of them indicated that there was more than one neighbour or peer that interacted with them regularly or successfully. The study also revealed that children who use AAC have significantly fewer communication partners compared to their peers, who typically had 40 or more partners and no difficulty developing new ones. In the majority of cases, less than seven people could be identified that could understand the AAC user.

Conclusions

The current data provides speech language pathologists with a foundation to understand the quality of AAC users' interactions and the factors that influence it but is limited to a minimal amount of studies. Okolo and Bouck (2007) reviewed research and found that only 10% of the 122 studies they reviewed investigated attitudes and social interactions of AAC users.

Solid conclusions are difficult to develop from the broad range of research that's available which is confounded by the limited amount of research specifically investigating social interactions of AAC users. The research designs used in the studies reviewed, range in design strength. The randomized clinical trials provide strong evidence but may be less naturalistic.   Although the number of studies reviewed was limited, similar findings can be seen across multiple studies, which increase the overall reliability of the findings.

Many of the studies used a design format where participants observed a videotape of an AAC user. This format is primarily used because it provides consistency in exposure as well as it is less time consuming. The ideal situation would be to naturally observe a real social interaction between an AAC user and peer.

Research in this area is extremely important, as improper support during social interaction could foster the AAC user to be unnecessarily dependent and/or cause the AAC user to avoid social interactions. Duchan (1997) concluded her argument stating it's important to provide the means for the AAC user to participate naturally with peers in daily events; interaction and participation in daily events are the only ends. She emphasized that the AAC user needs to feel they are participating because their participation is meaningful and motivating to them and valued by those with whom they interact.

Lilienfeld and Alant (2002) suggest that low rates of social interaction between AAC users and their peers can have a negative effect on the development of attitudes. Research suggests that AAC device features may have a significant effect on the attitude of conversational partners and their willingness to interact with the AAC user.

Multiple studies suggest the importance of being a multi-modal communicator. This allows the AAC user to be a more effective communicator in different environments by changing communication strategies.

Throughout the reviewed research, there is a trend dealing with the age and gender of the conversational partner or research participant. It's believed that gender impacts the attitude of the partner but further research should be conducted to solidify reliable conclusions.

Recommendations

Further research is needed to evaluate the quality of social interaction of AAC users. This research should specifically look at identifying factors that can enhance the quality of interaction and therefore possibly resulting in increasing the quantity

of interactions and number of conversation partners. There is evidence that if researchers can identify factors that improve the perception of the AAC user it could transfer to improved attitudes of the conversational partner.

Speech Language Pathologists (SLP) should adapt their approaches to allow evaluation of the success of an AAC device to include its functional use in interactive situations. There is a need to change the way that we evaluate the success of an AAC system. Shane (as cited in Felson Duchan, 1997) proposed that success must be measured as a function of its use in interactive situations such as conversational interactions, classroom interactions and social interaction within the community (p. 5). This means SLPs need to teach the AAC user how to utilize their AAC system functionally.

Using peer modeling should be another aspect that SLPs try to incorporate into their therapy approach. There is evidence that proves peer modeling rather than clinician/interventionist modeling can improve the AAC users ability to imitate and increase the amount of peer interactions.

SLPs should teach the AAC user and to encourage him/her to explain their situation and their device to the conversational partner. This may positively impact the quality of the social interaction. Research shows that this is beneficial so SLPs need to emphasize the importance of self-advocacy. SLPs should also teach and encourage AAC users to become multi-modal communicators. This is an important skill to focus on, as it helps the AAC user to communicate effectively in different environments and with different partners.

It is important that professionals, AAC users and their family know the factors that influence social interactions of AAC users. Features of an AAC system (ie. voice output) can impact the attitudes of conversation partners and ultimately influence the quality and quantity of social interaction. Access to this knowledge could possibly impact decisions that need to be made (eg. type of AAC system to choose) and promote better quality interactions and social development.

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