Exploring the Use of Augmentative and Alternative Communication with Emergent Literacy Learners

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Abstract: Augmentative and alternative communication (AAC) has the opportunity to transform the lives of individuals with complex communication needs (CCN). For neurodivergent learners who use AAC to communicate, their acquisition of language and literacy is often dependent on the tools they use and the amount of support and intervention they receive. Through the analysis of twenty-two studies, risks of delayed language development, use of AAC with emergent literacy learners, and implications for classroom context are explored. Although results indicate that AAC can benefit neurodivergent students in their acquisition of language and literacy, further research is needed to completely understand the value AAC brings to neurodivergent individuals with complex communication needs.

Keywords: augmentative and alternative communication, AAC, complex communication needs, CCN, emergent literacy

Introduction

In the early years of development, most children rapidly acquire speech and language skills to allow them to express needs and wants, interact socially with adults and peers, expand their conceptual development, and develop the foundations for more advanced language and literacy skills (Drager et al. 2010). However, not all children acquire these speech and language skills in the same way, as some young children develop disabilities and delays that impair their gross/fine motor, language, and cognitive abilities (Erickson et al., 2010). As an educator who has experience teaching in inclusive classroom settings, I have noticed a growing focus on how we can best support neurodivergent learners in the classroom, especially for those who use assistive technology and have emergent literacy skills. For the sake of this literature review, the term "neurodivergent" (plural: neurodiverse) will be used to describe individuals who display some type of difference or disability. This is currently the preferred term, as it recognizes differences in the brain as normal, as opposed to a deficit. This concept not only helps reduce the stigma around learning differences, but it also advocates for the inclusion of all people and all differences.

For neurodivergent students with speech delays or complex communication needs (CCN), many rely on augmentative and alternative communication (AAC) devices to communicate with their peers. Considering language, and the ability to communicate using language, is central to literacy learning, it is imperative that students who use AAC have access to the tools and strategies they need in order to be successful (Sturm et al., 2006). After all, how do neurodivergent students use AAC to acquire language and literacy skills? And how should educators and other educational stakeholders support emergent literacy learners who depend on AAC to communicate? Through the analysis of anecdotal evidence, empirical research, and various case studies, the role of AAC in acquiring language and literacy becomes evident. In addition, after reviewing the available literature and critically analyzing and synthesizing the findings, recommendations for educators and researchers are also highlighted.

Methods

Considering the ever-evolving nature of education and the push towards more inclusive classrooms, more research needs to be conducted on how to best support our diverse student population. This is especially true for students who rely on AAC devices to support their speech and language goals, as they deserve to have the same quality and access to learning as their peers. In preparation for this literature review, I first went about finding appropriate research articles by using a combination of keywords including: "augmentative and alternative communication (AAC)," "complex communication needs (CCN)," "emergent literacy," "assistive technology," "neurodiverse/neurodivergent," "education," and "communication." I limited my research to articles that surveyed English speaking AAC users and that fit closely to my topic of interest (for example, studies that used child participants were chosen over studies with adult participants). I also only selected sources that were either dissertations or peer-reviewed work and used Tracy's (2010) eight "Big Tent" criteria to analyze any qualitative research found. This was done to ensure both the validity and credibility of the findings and to rule out any possible discrepancies in the research. In addition to these search methods, I even used the process of backwards chaining, which is a technique that involves locating further research from a sources' reference list.

From these searches, I was able to find twenty-two suitable sources, one being a doctoral dissertation and four being systematic literature reviews themselves. It is also important to note that the majority of these sources are qualitative in scope, although there are a few included that are either quantitative or mixed methods approaches. These sources were all then "close read" (Gallop, 2000) to ensure minor elements within each study were not missed and

then organized by methodology, participants, themes, findings, and implications. The information gathered was later used as the basis for my literature review.

Findings

Advances in early language and literacy development have been substantial. Over the past decade alone, there has been a dramatic increase in our knowledge of literacy, assistive technology, and neurodivergent learners (Erikson et al., 2010). In this section, I explore the risks of delayed language development, how AAC can be used to support emergent literacy learners, and what implications may arise when using AAC within a classroom context.

Risks of Delayed Language Development

Learning to communicate using speech and language is a primarily developmental task for young children. In an international review of research surrounding neurocognition and augmentative and alternative communication (AAC), researchers Van-Balkom & Verhoeven (2010) found that delays in the acquisition of language are one of the earliest indicators that a child may struggle with some sort of developmental delay or disability. Detheridge & Detheridge (2002), researchers who have been studying AAC since the early 1980s, also established that delays with language are a pre-eminent sign of further developmental and academic struggles. Even Drager et al. (2010), who completed a qualitative research study on the topic of AAC interventions for young children with CCN, discovered that without access to functional communication, children with CNN are at considerable risk in many aspects of their development. Considering what is at stake for these children, educators and researchers need to do more to engage neurodivergent students in literacy tasks and support them in their acquisition of language and literacy.

For neurodivergent individuals who are non-verbal or who have speech-language delays, many are introduced to different types of assistive technology to help support their communication goals. Assistive technology (AT) emerged during the advent of microcomputing in the 1970s. It consists of any item, piece of equipment, or system that is used to increase, maintain, or improve the functional capabilities of individuals with disabilities (Erickson et al, 2010; Waller, 2019). The most common assistive technology used to support individuals with CCN is augmentative and alternative communication devices. At its simplest, AAC can be low-tech devices like core communication boards or books, which contain messages (single words or whole phrases) in the form of written text or symbols. At its most complex, users have to master a high-tech computer system that speaks out a message (often a word or phrase) using a programmable speech synthesizer (Waller, 2019; Wilkins & Ratajczak, 2009). The common thread across both high- and low-tech systems is the use of graphic symbols to represent concepts and words paired alongside a small yet meaningful piece of text.

For researchers like Waller (2019), a professor who studies the design and efficacy of AAC programs, the development of these computer-based assistive technologies has opened up unimaginable opportunities for people with speech and/or physical impairments. Barker et al. (2013) also believed that these devices not only support children in learning the symbolic and functional aspects of language, but also allows them to communicate sooner and more effectively. In addition, qualitative researchers Erickson et al. (2010) found that without immediate access to devices like these, most neurodivergent students will fail to access information and successfully engage as learners. Without being able to communicate their thoughts, feelings, and understandings with others, neurodivergent students ultimately struggle to develop the key emergent literacy skills needed to make sense of the world around them.

Using AAC with Emergent Literacy Learners

Emergent literacy is best described as the reading and writing behaviours that precede and develop into conventional reading and writing (Erickson et al., 2010). For educators in pre-kindergarten to grade one classrooms, much of the literacy that is taught is focused on emergent reading skills and strategies. This includes understanding the functions of print, phonological and phonemic awareness, alphabet knowledge, and other important receptive and expressive language skills such as vocabulary, syntax, fluency, and comprehension (Barton-Hulsey et al., 2021; Erickson et al., 2010; Koppenhaver, 2000). For neurodivergent students who are nonverbal or have speech-language delays, acquiring these emergent literacy skills becomes even more challenging. In fact, previous research on this topic confirms these worries. In a Kansas City study surveying 83 neurodivergent children under the age of four, researchers found that participants struggled to acquire basic emergent language skills without intensive intervention or use of an AAC device (Barker et al., 2013). In another study, this time surveying twenty-three neurodivergent children under the age of five,

researchers discovered that children who exhibit complex communication needs are at a greater risk for limited development of skills related to literacy and language (Barton-Hulsey, 2021). Finally, Koppenhaver (2000), an academic who has been studying this area of interest for the past few decades, noted that students who use AAC typically experience splintered, less consistent, or even limited literacy learning opportunities due to their complex communication needs. According to research, this may be due to a lack of teachers' knowledge about literacy curricula or it could be closer related to available supports to literacy learning (or lack thereof) for neurodiverse students (Machalicek et al, 2010; Sturm, 2006). Despite the growing amount of research surrounding this topic, students still, unfortunately, face significant barriers when it comes to emergent literacy instruction.

Although the literacy outlook for these students looks bleak, providing adapted and scaffolded literacy experiences is one potential area for successful intervention. In a systematic literature review completed by Barker et al. (2012), they discovered that AAC devices could be incorporated into whole group read alouds and phonological awareness lessons to increase participation and communication. This sentiment is also shared by Barton-Hulsey et al. (2021), who found during a small-scale study that neurodivergent children used AAC systems to support their vocabulary, language acquisition, syntactic development, and overall social communication. Finally, Yorke et al. (2021) added to the dialogue by suggesting neurodivergent children benefit from shared reading experiences that are supported by the use of their AAC devices. Given the research highlighted, utilizing AAC with neurodivergent children in one's classroom seems promising.

In addition to these suggestions, researchers also make mention of bridging the literacy gap by providing access to adapted AAC picture books. It is important to note that these adapted AAC books are different from regular juvenile literature in that they often include core vocabulary symbols from AAC devices/core boards. According to Quinn et al. (2020), "providing graphic symbols may further support strengths in receptive language because concurrent presentation of graphic and oral representations can facilitate comprehension" (p.81). These adapted AAC picture books not only give neurodivergent emergent readers the chance to learn core vocabulary that they can then find and use with their AAC device, but it also aids in their comprehension of stories that are read. Detheridge & Detheride (2002) pointed out the benefits of literature like this, as symbols can be created to support readers of different abilities so that all readers have access to the same story, just at different levels. Similarly, Holyfield's (2021) quantitative study found that the initial evidence of pairing symbols with text supported neurodivergent children with Autism Spectrum Disorder in accessing communication, language, and literacy. Furthermore, both Caron et al. (2018) & Light et al. (2021) discerned that the direct pairing (both between the text and graphic symbol and between the speech output) can support the learning of the association between a written word and its referent. Finally, Erickson et al. (2010) believed in adaptive literature so much that they even created an online database, called Tar Heel Reader, so that individuals could access readily made adapted AAC picture for their perusal. When taking these studies into consideration, it seems that utilizing AAC in the classroom may be an efficient way to support neurodivergent children and their emergent literacy needs. Given that the cognitive process in comprehending text is the same for all individuals (Koppenhaver, 2000), it is important that students who use AAC have access to reading activities that provide a foundation for literacy learning (Sturm et al., 2006).

Implications for Classroom Context

As Caron et al. (2018) mentioned, "infusing opportunities for the development of literacy skills within AAC supports has the potential to lead to better outcomes for individuals with complex communication needs" (p.129). Although adults often assume communication is instinctive, especially when presenting a neurodivergent child with an AAC device, this is simply not always the case. As Stephenson (2010) shared in her qualitative research study on book reading, children learn communication through imitation and positive reinforcement of their communicative attempts. As teachers and parents model, encourage, redirect, and reiterate key concepts related to emergent literacy learning while using AAC, neurodivergent children begin making connections as they participate in the communication exchange (Wilkins & Ratajczak, 2009). Although gains in emergent literacy skills can occur with the use of AAC, without comprehensive support from educators, parents, and other educational stakeholders (such as speech language pathologists or other multidisciplinary team members), neurodivergent children will struggle to use their AAC device adequately and effectively (Newton, 2019). Like the development of the ability to use words as symbols, the ability to use pictures as symbols develops slowly, through multiple experiences with competent picture users (Stephenson, 2010). Therefore, as teacher-researchers, we must explicitly model and teach them the AAC skills we want them to acquire, as well as provide them with rich opportunities to use their AAC devices in everyday literacy experiences. Just like when a student learns a new language, neurodivergent students with AAC devices need explicit instruction

and lots of opportunities for exposure. After all, as Erikson et al. (2010) pointed out, mere access to the content is inadequate unless that access is mediated by instructional design supports appropriate for the specific needs of the user.

Another consideration for educators to keep in mind is the amount of variation that is available when it comes to choosing AAC. As mentioned earlier, AAC can vary from low-tech core board visual options to high-tech speech synthesizing devices. Because each individual child has different speech and language needs, they may require different AAC devices and/or programs. "Young children with language impairments have diverse profiles and needs for intervention. Furthermore, the complexity of the language system and the relationship of language and communication to the other domains of development make effective early intervention uniquely challenging" (Kaiser & Roberts, 2012, p.298). Due to the diverse needs of individuals, there are many different AAC vocabulary boards and assistive technology software. As Waller (2019) found in their recent qualitative study, the emergence of mobile technologies and social media over recent years has also spawned a proliferation of AAC apps. The most popular AAC apps, to date, are Wordpower, Snap + Core, Proloquo2Go, and LAMP Words for Life. These apps all differ in that they each have their own distinct graphic symbols, layout, and style. As Light et al. (2021) emphasized within their AAC intervention case study with three-year-old users, AAC systems must be designed to meet the needs and accommodate the skills of each individual child in order to be optimally effective. If teachers are truly going to support the AAC use of neurodivergent children in their acquisition of emergent literacy, then they must be flexible and understanding of each child and their capabilities.

Conclusion

For educational stakeholders who support neurodivergent students, many realize that the way they have always taught or done things may not be sufficient and effective for all students. After years of teaching and supporting students who use augmentative and alternative devices, I have come to the understanding that more needs to be done in order to support their language and literacy needs in the classroom. Through this literature review, I have attempted to explore the use of augmentative and alternative communication with emergent literacy learners. By reviewing the available literature, I have found that neurodivergent children rely on AAC to communicate with peers and share their understanding with others. When given the opportunity to do so, they also use their AAC devices to participate in literacy experiences, whether that be in small group activities or shared whole-class book readings.

Considering the development of literacy skills in individuals who use augmentative and alternative communication requires the collective efforts of collaborative literacy teams who have expertise in language, literacy, and AAC (Fallon & Katz, 2008), it is important that all educators become aware of the role AAC can play as we look to support our neurodivergent learners in the classroom. Through the analysis of anecdotal evidence, empirical research, and various case studies, I have discovered that educators and other educational stakeholders need to be more present when supporting emergent literacy learners who depend on AAC to communicate. We need to ensure that each child has appropriate access to AAC (whether it be a low or high tech device) and that there is a team of support alongside them to model and teach how an AAC device is supposed to be used.

By reviewing the available literature and critically analyzing and synthesizing the findings, I have ultimately come to the conclusion that AAC is an integral aspect in the lives of neurodivergent children, especially when it comes to helping them achieve their emergent literacy goals. As Light & Drager (2007) shared, "with access to appropriate AAC systems and early evidence-based AAC interventions, young children with complex communication needs will have the opportunity to maximize their functional communication, language development, and literacy learning, and will be able to attain their full potential" (pp.213-214). Therefore, as teacher-researchers, we must not only support students who use AAC devices, but we should also further the dialogue by sharing our experiences in professional and research journals as well.

Limitations

The goal of this literature review was to gather, analyze, and synthesize the evidence surrounding the use of augmentative and alternative communication devices with emergent literacy learners. Despite the promising findings from the research discussed previously, this current review has several limitations. For instance, I used one dissertation in my review which did not go through the full peer review process. Furthermore, more than three quarters of the studies I used were small scale in nature. Out of the twenty-two articles I used as a basis for my literature review, only four (Barker et al., 2013, Barton-Hulsey et al., 2021, Newton, 2019, Sturm et al., 2006) included more than ten research

participants in their studies. This ultimately limits the scope of each study, as a smaller sample size minimizes the results of the findings. Although this literature review on augmentative and alternative communication comes with a few limitations, we can no longer ignore the possibilities it provides to our neurodivergent emergent readers.

Further Study

In order to fully realize the possibilities AAC provides to neurodivergent, emergent literacy learners, further research is required. Not only is additional research regarding AAC and emergent literacy learners needed, but research with more participants and larger data sets are also necessary. In future reviews and studies, there should also be a focus on the strategies involved in supporting AAC intervention and language and literacy acquisition. Such research is critical to ensure neurodivergent children who use AAC receive the effective intervention they need to develop language and literacy skills, and ultimately attain communicative competence (Koppenhaver, 2000). Ultimately, when we believe that all children have the ability to succeed, we unlock the potential of each child. Continued research in this field of academia will only broaden the scale and scope of analysis already discovered and expand on it to maximize the outcomes for individuals with complex communication needs.

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