Murray State Theses and Dissertations   Graduate School

2017

Caregiver Training Program on Emergent Literacy Development of Augmentative and Alternative Communication Users

Meghan Bowers
Murray State University

CAREGIVER TRAINING PROGRAM ON EMERGENT LITERACY DEVELOPMENT OF

AUGMENTATIVE AND ALTERNATIVE COMMUNICATION USERS

A Thesis

Presented to

The Faculty of the Department of Communication Disorders

Murray State University

Murray, Kentucky

In Partial Fulfillment

of the Requirements for the Degree

Master of Science in Speech-Language Pathology

by

Meghan Bowers

May 2017

CAREGIVER TRAINING PROGRAM ON EMERGENT LITERACY DEVELOPMENT OF

AUGMENTATIVE AND ALTERNATIVE COMMUNICATION USERS

Date Approved: _____

_____
Thesis Advisor

_____
Member, Thesis Committee

_____
Member, Thesis Committee

_____
Collegiate Graduate Coordinator

_____
Dean of the College

_____
University Graduate Studies Coordinator

_____
Provost

Acknowledgements

I would like to thank all those who have been involved in the development and completion of this project. I would like to thank Dr. Karen Coulter for leading my thesis committee and for her never ending support, patience, guidance, and time she has dedicated to this project. I would also like to thank for Dr. Sharon Hart and Dr. Christina Grant for being members on the thesis committee. Your constant presence was reassuring in times of stress. Without the support and devotion of time from my committee member this project would not be possible.

Thank you to my classmates, supervisors, and faculty for the encouragement and kind words throughout this process. Lastly, I would like to thank my mother and father, Don and Sherry Bowers. Their love, support, guidance, and encouragement has carried me though this entire process. Without their frequent phone calls and messages of support I would not be where I am today. Thank you all very much

Abstract

Caregiver Training Program on Emergent Literacy of Augmentative and Alternative

Communication Users

Teaching early literacy to typically developing individuals is widely practiced and has a

vast amount of research backing its success (Strum et. al., 2006). Current research has shown

that both children and adult augmentative and alternative (AAC) users are underachieving in the

development of reading and spelling skills, but the underachievement in these areas is not

correlated to a lack of cognitive and linguistic abilities (Sandberg, Smith, Larsson, 2010). Like

their typically developing peers, AAC users must have the same repeated opportunities to

participate in a wide range of literacy tasks to attain literacy skills (Strum et. al., 2006).

Children with issues in acquiring language are at higher risk for having difficulty in

acquiring skills not only in speech, but in reading and writing development (Spracher, 2000).

Literacy skills will provide AAC users with an outlet for educational opportunities, vocational

opportunities, self-expression, potential for independent living, entertainment, and prevention of

communication breakdowns in face- to-face conversations (Light, 2008; Erickson, 2003). It is

not the responsibility of an SLP to duplicate the literacy education provided by a teacher, but to

help promote a student's skill during therapeutic speech and language interventions (Pebly &

Koppenhaver, 2001).

The purpose of this study was to determine if a training program for a literate partner to

implement with the AAC user to increase \ emergent literacy skills will be successful and if the

literate partners will notice a difference in literacy skills in the normal environment of the AAC

user. Intervention consisted of the implementation of the parent-training program on literacy

development and education for AAC users in the home. A pretest posttest design was used to

determine the effectiveness of the parent-training program following an 8-week period of implementation.

The participants demonstrated minimal improvements in emergent literacy skills based on caregiver report via surveys, but quantitative improvements were not observed due to inability to complete statistical analysis. Further research in literacy development for AAC users is necessary.

Table of Contents

Chapter 1

Introduction

A speech- language pathologist (SLP) is responsible for assessing, diagnosing, and treating disorders within speech, language, cognitive deficits, voice, swallowing, and fluency (What is a SLP?, 2016). Language, and the ability to communicate using language, is central to literacy learning (Strum, et. al., 2006). Spracher's research (2000) found children with issues in acquiring language are at a higher risk for having difficulty in reading and writing development.

SLPs scope of practice includes literacy (Spracher, 2000). SLPs have "knowledge of language and its subsystems-phonology, morphology, syntax, semantics, and pragmatics" which are ties to prevention, assessment, diagnosis, and intervention for literacy problems (Spracher, 2000, p. 2). SLPs must then be a part of the collaborative team treating reading problems of children with language delays or disorders.

Before further discussion, it is necessary to breakdown the terms that will be discussed throughout this paper. Literacy is known as a "learner's capacity to use a complex set of abilities to identify, understand, interpret, create, communicate, and compute printed and written materials that include alphabetical signs, visual icons, and graphic and tactile symbols" (Balkhom, 2010, p. 149). Phonology is the sound system by which language is produced (ex. /p/, /b/, /m/). The smallest unit of language that holds meaning is called morphology (ex. cat, "-s", "-ed"). Syntax is the form and structure of language. The word meaning, or vocabulary, of language is referred to as semantics. Lastly, pragmatics is the social use of language. All of these aspects come together to form the language we use in speech and literacy. The connections between spoken and written language "are well established in that spoken and written language

have a reciprocal relationship, such that each builds on the other to result in general language competence, starting early and continuing through childhood into adulthood" (Spracher, 2000, p. 3).

An SLP may find that their role in supporting emerging literacy is also a key factor as they also address other needs, such as the need for augmentative and alternative communication (AAC). AAC is defined as aided or unaided supplementation of a natural means of speech (Hetzroni, 2004). "An estimated 2 million Americans have significant communication disabilities and require augmentative and alternative communication (AAC)" devices (Light, 2003, p. 4). The use of an AAC device or system allows an individual who has difficulty with using verbal or expressive language to communicate (AAC, 2016).

It is imperative that students who use AAC have access to tools and strategies that support them across all modes of communication (Strum et. al., 2006). Literacy skills will provide an AAC user with a means for better educational and vocational opportunities. It can also support increased self-expression, independence, entertainment, and improved communication in face-to-face conversations (Light, 2008; Erickson, 2003).

Children who require the use of an AAC device to communicate are at risk of delayed language development (Light, 2003). Current research has shown AAC users as underachieving in the development of reading and spelling skills. In fact, research found an estimated 90% of AAC users cannot read over a second grade reading level (Erickson, 2003). Underachievement in these areas is not correlated to a lack of cognitive and linguistic abilities (Sandberg, Smith, Larsson, 2010), but rather other internal and external barriers secondary to needs associated to the individual's use of AAC. It is the responsibility of an SLP to help promote a student's

literacy skill during therapeutic speech and language interventions (Pebly & Koppenhaver,

2001). As can be seen from the above, this is especially true for individuals using AAC.

Chapter 2

Review of Literature

To develop the skills necessary for literacy, an individual must first have the appropriate cognitive skills to attain these abilities. A working memory and attention regulation have been found to be basic requirements for storage and retrieval of lexical items and lexical to linguistic associations (Balkhom, 2010). Without the necessary cognitive abilities, an individual will not be capable of developing literacy skills.

Literacy Development

Literacy acquisition is achieved via repetition, consistency, and active participation in a wide array of authentic literacy tasks (Strum et. al., 2006). Emergent literacy is the foundation for more complex literacy skills. Emergent Literacy is defined as literacy skills that are introduced from birth; well before the skills of reading and writing develop (Roth, Paul & Pierotti, 2006). Emergent literacy includes developing sound-symbol associations, phonological awareness skills through exposure to print in daily routines, interacting with text, questions related to text, and story retelling (Roth, Paul & Pierotti, 2006). Typically these skills develop during time spent with chosen books on a daily basis at home with parents or caregivers (Strum et. al., 2006).

Teaching early literacy to typically developing individuals is widely practiced and has a vast amount of research backing its success (Strum et. al., 2006). As stated before, exposure to print in books is a means for early literacy development. It provides children with exposure to print, language skills, phonological awareness, and some potential sound-symbol associations. (Light, 2003).

One of the earliest skills to develop is phonological awareness. Phonological awareness is "an individual's understanding or awareness of the sound structure of language; it involves the ability to notice, think about, and manipulate the phonemes of words" (Light, McNaughton, Weyer, and Karg, 2008, p.122). Having an awareness of letter names, letter sounds, letter forms, vocabulary and print functions are all-necessary for later success in both reading and writing. All of these skills are needed and often are developed prior to the entry in school (Sandberg et. al., 2010)

Typical literacy development is dependent upon a vast array of skills. For a typical developing student the acquirement of literacy skills requires abilities in a variety of domains including:

orthographic processing (i.e., processing and identification of letters and letter patterns),

phonological processing (i.e., detection and manipulation of the sound structures of

speech and mapping of letters to sounds and sounds to letters); context processing (i.e.,

use of vocabulary knowledge, syntactic/grammatical knowledge), and meaning

processing (i.e., integration of orthographic, phonological, and contextual processing to

build coherent understanding of the meaning of the text to encode meaning into coherent

text) (Beukleman & Mirenda, 2013, p. 310).

In today's classrooms teachers successful in educating children about literacy use balanced instruction, a high amount of literacy activities, teach foundational skills and encourage self-regulation (Strum et. al., 2006). This is especially true in within first grade instruction. First graders are exposed to a wide array of instructional practices and types of texts. This again provides a balance of literacy instruction, comprehension training, word level instruction, and independent reading (Strum et. al., 2006). During first grade, reading activities have a high focus

on print concepts so that students develop a foundation of sight words. Comprehension training is through story retelling activities, group discussions, and connecting the stories to their personal experiences. First and third grade teachers both emphasized automatic word recognition via shared reading (Strum et. al., 2006), but by third grade reading expectations are much higher.

By the third grade teachers provide a more narrow focus within literacy programs (Strum et. al., 2006). Specifically, main focus in third grade literacy programs is reading comprehension. By third grade it is expected for a student to have reading fluency, so word level and decoding instructions are no longer emphasized. Children are expected to be efficient in both oral and silent reading, finding the main idea of texts with classmates, and context readings.

Literacy Development with AAC Users

AAC students access the same cognitive learning processes to read and write as typically developing students as long as their speech and physical impairments are not affecting their cognition. (Strum et. al., 2006). AAC users require the same abilities of attention regulation, memory functions, and memory capacities that typical literacy learners have (Balkhom & Verhoeven, 2010). Like their typical peers, AAC users must have the same repeated opportunities to participate in a wide range of literacy tasks to attain literacy skills (Strum et. al., 2006). "Research has demonstrated that that preschoolers (ages 3-5) with complex communication needs (including those with autism, cerebral palsy, and Down Syndrome) can learn to read and write when they are provided with appropriate instructional supports" (Beukelman & Mirenda, 2013, p. 322). As a SLP, it is necessary to be aware that individuals with the cognitive abilities to acquire literacy can develop the skills despite their disabilities and the barriers that accompany the disability.

Students who use AAC often have a limited or splintered literacy learning experience (Strum et. al., 2006). This is frequently due to barriers. Barriers to AAC users developing appropriate literacy skills can be either intrinsic or extrinsic. Intrinsic factors deal with the individual's specific disability and the characteristics that come along with the diagnosis. Intrinsic barriers may include:

- *Visual impairments*, which will limit the ability to visually recognize and discriminate letters of printed texts.

- *Hearing impairments*, which will limit the perception of sound of spoken language.

- Motor disorders or impairments will limit the AAC users interaction with writing utensils and other reading materials.

- *Cognitive impairments* can affect an individual's working memory and processing skills use in reading and writing.

- *Language impairments* can affect the development and understanding of semantics, syntax, and morphology.

- *Speech impairments* that will interfere with an individual's ability to translate spoken language to written language or written language to spoken language.

- A *lack of experiences* which will affect the individual's world knowledge and ability to relate to texts

- *Limited participation*, which will not allow for successful development of skills necessary in developing literacy (Beukelman & Mirenda, 2013,

    Some extrinsic factors that may affect an AAC users development of literacy include physical and social limitations. Motor impairments are common among children with complex communication needs. Motor impairments have the potential to limit the physical interactions the

children have to literacy materials, which will limit their overall participation in literacy activities (Beukelman & Mirenda, 2013). A physical or occupational therapist can be consulted on an individual basis to suggest the appropriate accommodations for each literacy learner. It is important that the physical adaptation does not require increased cognitive demands, so the learner can focus their cognitive attention to literacy activities (Beukelman & Mirenda, 2013).

In looking at the effects of motor limitation on literacy, research shows that AAC users have reading and writing materials at home just as typical literacy learners do (Light & Kelford-Smith, 1993). The difference is the lack of access to these reading and writing materials. Parents of AAC users report this is due to an increase in time spent completing daily acts of living, such as bathing, as compared to that of typically developing children (Beukleman & Mirenda, 2013).

Other extrinsic factors include cultural and instructional limitations. Social factors include limited access to an individual's AAC device during literacy activities, which in turn limits the user's participation. Another aspect of this is found in the attitudes or expectations held by parents, caregivers, and teachers. The level of expectations held for AAC users are often far less than the expectations held for typically developing peers (Beukleman & Mirenda, 2013).

Finally, there is little evidence-based research thus far regarding the development of literacy skills in this population. Beukelman and Mirenda (2013) are one of the few to investigate this topic. They found differences between the literacy exposure of a typically developing individual compared to that of an AAC user. They found storybook reading to be vastly different for AAC users. Typically developing peers are able to choose the book used in literacy activities and often choose the same book, which allows for repeated exposure (Beukelman & Mirenda, 2013). AAC users typically don't have this ability, so parents or teachers are the ones who select the text, and they often choose different books. Without the repeated exposure to the

same text individuals with complex communication needs are unable to build competence and participate in the storybook readings. Repeated exposure to a common text allows an individual to develop "comprehension skills, learn inference skills, practice-retelling skills, anticipate events of the story, and participate in pretend reading" (Beukelman & Mirenda, 2013, p. 315).

Another variation between typical literacy learners and AAC users literacy learning found by Beukelman & Mirenda (2013) is the individual's involvement in the activity. The parent, teachers, or paraprofessionals often dominate and direct storybook reading for AAC users. During storybook reading interaction is often focused on the mechanics, such as turning the page, rather than focusing on reading comprehension. The AAC users were found to not interact with their AAC devices or systems during storybook reading, which also limited their participation (Beukelman & Mirenda, 2013).

Aside from supporting literacy development, it is also a challenge to properly assess AAC users literacy skills. The assessment of literacy skills for this population is difficult because traditional tests often are not applicable and require adaptations (Balkhom & Verhoeven, 2010). This issue is compounded by their significant lack of exposure to print materials and drawing actives that help spur reading and writing abilities (Light & Kent-Walsh, 2003).

Treatment of Literacy Development for AAC Users

Despite the list of barriers and potential challenges that accompany literacy development for AAC users, its importance still remains. The current research calls for parents, caregivers, and teachers to adjust their approach to teaching emergent literacy skills to AAC users. A variety of potential changes have been investigated within recent research.

To date interventions have targeted turn taking, receptive and expressive language knowledge, and expanding the length of messages expressed by individuals with complex

communication needs during storybook reading (Beukelman & Mirenda, 2013). One way to achieve this goal is for parents, teachers, and paraprofessionals to provide the user with vocabulary concepts on their AAC device during reading activities. This will requires SLPs to train the literate communication partner to how to implement this strategy using any number of AAC strategies or levels (Beukelman & Mirenda, 2013). These strategies span the entirety of reading (Beukelman & Mirenda, 2013). The first step is for a literate partner to allow the learner to select the book. The partner then needs to introduce the topic of the book, introduce new vocabulary as required, and read the text of the book. There are several language learning strategies they also need to incorporate, such as the use of time delay, the use of questions, and modeling the use of the AAC device as well as natural speech. Finally, they need to respond to the learner's communication attempts, and encourage the learner to tell the story. Research has shows that a wide variety of partners can learn to implement and use a combination of these strategies in short amount of time (Beukelman & Mirenda, 2013). Not only this, but these strategies are effective for a wide range of ages and AAC systems. The user can be provided access to AAC via "manual signs and gestures into story reading activities, using objects to communicate choices during story reading, providing simple switches programmed with repeated story lines, provide low tech communication boards with story related vocabulary to ask questions and comments" (Beukelman & Mirenda, 2013, p.316). These skills can also be used for adults who also lack emergent literacy skills and build their language skills to make connections between spoken and written language. Although storybook reading is the most highlighted in emergent literacy, it is important to continue to read and discuss texts with learners beyond this stage.

AAC users need the same positive supports and expectations as typically developing children to gain the same success in literacy skills (Sandberg et. al., 2010). Research suggests that AAC users can develop the emergent literacy ability of phonological skills as long as they do not have impairments within this specific area (Light & McNaughton, 2012). They just need have meaningful and repeated experiences with words in text to help in the development of automatic word recognition. Research shows that, "with appropriate intervention, children who require AAC can participate actively in story-reading interactions, develop important language skills to support literacy development, develop phonological awareness skills, and learn early reading and writing skills" (Light & Kent-Walsh, 2003, p.29). Acquisition then depends more on "opportunities, individualized programs with adaptations, and various means and techniques of interactive storytelling" (Balkhom, 2010, p. 154). If a literacy team, including caregivers, implements interventions consistently, the development of literacy skills will become achievable.

Another learning goal used in typical learning classrooms that needs to be addressed for AAC users is independent reading, which establishes an individual's motivation, book preferences, vocabulary foundations, building repertoire of sight words, and enhancing fluency (Beukelman & Mirenda, 3013). To allow AAC students successful access to independent reading there needs to be a range of choices on their reading level and the books need to be independently accessible. To make books independently accessible multiple technologies could be offered to both parents and students.

Even with research showing that AAC users are able to achieve literacy, Strum et. al. showed that cognitively capable AAC users are falling behind in their literacy development.

Many students who use AAC have not developed sophisticated automatic word recognition skills by the third grade. In order to avoid having students who use AAC get

lost in the cracks between the first and third grades it is critical that automatic word

recognition activities are adapted and made accessible beginning with the early grades

(Strum et. al. et. al., 2006, p. 27).

For AAC students to have successful word recognition acquisition via shared reading they need

to have access to their AAC devices. Access does not mean they just need to have their

communication system in front of them. At a minimum to actively participate in pre and post

reading discussion, they need access to the vocabulary related to the story, vocabulary-allowing

discussion of predictions, and vocabulary related to opinions and responses (Strum et. al., 2006).

Typical literacy learners produce verbal responses during literacy instruction to determine

their ability of the skills being targeted, but with children who have complex communication

needs this is not always possible. Literacy activities can be easily adapted to not rely on verbal

response by allowing access to the AAC device (Beukelman & Mirenda, 2013). Oral rehearsal is

often a skill that typical literacy learners apply to translate written language into oral language or

vice versa. Oral production is not a skill that children with complex communication needs can

depend on throughout the learning process, so they will need increased involvement by the

literacy partner to adjust for their lack of access to speech production skills (Beukelman &

Mirenda, 2013). At the same time, providing users with access to voice output devices also

provides them an opportunity to hear the sound production of individual letters, word chunks,

and whole words while actively participating in the lesson (Strum et. al., 2006).

Finally, AAC users have also been found to have limited amounts of literacy instruction

as compared to their peers. Recommended practices suggest that "all students in Grades 1-3

should receive at least 90 minutes of literacy instruction per day and that students who are at risk

for literacy development problems should receive a total of 130-150 minutes of literacy

instruction per day" (Beukelman & Mirenda, 2013, p. 321). Research suggests that this is not the case for AAC users. Their daily instructional time was found to be substantially less.

In conclusion, reading has the potential to provide learners with a variety of skills that will not only aid language acquisition, but also allow more involvement and success throughout an individual's life. The goal of competency begins with the developmental of the individual's foundational skills. Phonological awareness is one of the cornerstones of emergent literacy (Light, 2008).

There are many barriers on the road to literacy competency for AAC user that have yet to be addressed. Deficits in phonological awareness abilities are cited as a significant barrier of literacy to children using AAC devices (Sandberg et al., 2010). As shown in the literature above, research has demonstrated time spent with books, combined with access to an individual's AAC device and a literate partner can result in improved emergent literacy skills. Based on this premise, this study will ask the research questions:

1) If a training program for a literate partner to implement with the AAC user to increase the emergent literacy skills will be successful

2) If the literate partners will notice a difference in literacy skills in the normal environment of the AAC user.

Chapter 3

Methods

Participants

Two participants in primary grade levels were obtained for this study. Primary grades

levels include kindergarten to third grade. The cognitive levels were based off of previously

obtained cognitive testing. Participants were collected via contacts within the Murray State

Speech and Hearing Clinic, contacting local schools within the western Kentucky region, and

contacting the Western Kentucky Cooperation for students fitting the criteria. A contact flier was

sent to the Director of Assistive Technology in Western Kentucky and local Murray elementary

schools (Appendix B).

The participants for the study were selected based on the following criteria: cognitive

level, use of an AAC device, appropriate age for literacy participation, adequate vision and

auditory acuity, and positive caregiver participation for continuity of program administration.

The participants and caregivers were informed of what the study was to consist of and signed a

letter of consent prior to beginning the study. The proposed study followed a non-experimental

pre-test post-test design. There was not a control group for this study, due to the limited

population available.

The participants obtained for this study were both males. Participant 1 was a 7 year 5

month old male using Picture Exchange Communication System (PECS) in the school system.

Participant 1 had good familial support and was responding well to the implementation of PECS

based on parent and school SLP report. Participant 2 was a 5 year 11 month old male also using a

PECS communication book in the school system. Participant 2 was also reported to have good

familial support and good response to a PECS communication book in the school setting. Both

participants completed the necessary consent documents (Appendix A).

Materials and Procedure

The participants' caregivers attended a single training program at Murray State Speech

and Hearing Clinic that detailed how to better improve literacy development. The program

provided the caregivers with handouts (Appendix C) of research in the area of literacy and how

literacy skills can impact the life of the AAC user. The main targets of the training highlighted

the importance of providing appropriate amounts of literacy exposure, allowing access to an

individuals AAC device during literacy experiences, providing the opportunity for the AAC

users to interact with the text, and allowing the AAC users the opportunity to choose the text.

The training provided detailed demonstrations of how to interact with their children

during literacy times. The caregivers were provided with ways to allow more independence and

enjoyment for their children during literacy time by allowing them to choose the text.

Demonstrations included using a finger to follow along with texts, highlighting letter sounds,

making the text interactive, and providing time for the child to respond if they desire. During the

training program visit the participants completed a pretest survey and assessment. The caregivers

were given 8-weeks to implement the changes. Following the 8-week period the parents

completed the survey again and the children's skills were reassessed via a standardized

assessment.

The participants' literacy skills were assessed prior to and following the implementation

of the caregiver-training program using the Test of Preschool Early Literacy (TOPEL)

assessment. "The TOPEL has three principle uses a) to identify children who are likely to have

problems learning to read and write, b) to document progress in early literacy related skills as a

result of intervention and c) to measure early literacy related skills in research studies" (Lonigan, Wagner, & Toresens, 2007, p. 3). The TOPEL is cited as being a valid and reliable measure for the skills of semantic knowledge, print knowledge, and phonological awareness. The assessment is estimated to take about 30 minutes to administer. The areas of focus within emergent literacy in this study were the progress made in the areas of print awareness, sound letter correspondence, sound blending, and sound elision.

To evaluate the changes of the AAC user and caregiver during literacy time, the caregiver completed a pre-treatment and post-treatment survey. The survey evaluated caregiver participation, AAC user participation, the literacy environment, literacy exposure, and observed literacy understanding using both quantitative and qualitative questions (Appendix D). The completed pre-treatment and post-treatment surveys were compared for differences in caregiver and AAC user literacy participation as well as the caregivers perceived changes in the literacy environment, AAC users participation, caregiver participation, literacy exposure, and the observed literacy understanding of the AAC user.

The standardized pre-test and post-test scores collected from the TOPEL were to be analyzed via a non-parametric test of Wilcoxon Signed Rank Test. The Wilcoxon Signed Rank test is used to assess matched data as well as observed differences. The Wilcoxon assesses two sets of scores from the same participant before and after the application of a treatment of change (Wilcoxon Signed Rank Test). The dependent variable will be the standardized score obtained from the TOPEL. The independent variable will be the implementation of the caregiver program at home over an 8-week period. The caregiver assessment will be assessed qualitatively.

Chapter 4

Results

The results for the previously stated research questions were answered. The research

question that were targeted by this study were:

1) If a training program for a literate partner to implement with the AAC user to increase the

emergent literacy skills will be successful

2) If the literate partners will notice a difference in literacy skills in the normal environment

of the AAC user.

The first research question was assessed via the standardized assessment of the TOPEL. The

second research question was answered via the caregiver survey.

TOPEL

The pre and post-standardized assessments could not be completed due to participants'

limitations both in attention and cognition. The assessment was unable to be statistically

analyzed. Since information gathered was still valuable, a criterion-based analysis was used for

parts of the pre and posttest. The pre-literacy elements of letter recognition and print awareness

were the concepts that comprised subtest 1, Item Sets A and B of the TOPEL and were presented

within the assessment process.

Letter Recognition. Letter recognition was assessed via Item Set B of the TOPEL. As

mentioned previously, a modified approach was used for this section. The modification entailed

a presentation of a structured array of two letters. Participants were asked to identify a letter

given a verbal directive. Once the child identified a letter they were rewarded with playtime

with a desired toy. This not only enabled the examiner to determine letter recognition abilities,

but also establish a work-reward system with the participants.

The pretest was modified for both subjects. During the pre-test participant 1 was able to accurately identify 100% (2/2) letters successfully when presented. Due to the subject's level of functioning, diminished attention, and physical aggression this task was discontinued after two items. The subject's full abilities could not be probed. In the pretest of participant 2, the subject was able to accurately physically select 90% (9/10) of letters verbally identified in a variety of placements by the clinician.

In the posttest the modified format did not have to be used, but was used for participant 2. In the posttest participant 1 was able to complete portions of the TOPEL. He completed Subtest 1 Item Set B, which consisted of 10 letter recognition questions. Participant 1 tended to 8 stimulus questions in the post assessment. Participant 1 was able to accurately answer 20% (2/10) of stimuli correctly. Participant 2 did not attempt the letter recognition items on the TOPEL. The modified assessment was attempted again with participant 2 in the posttest, but the participant was not able to comply.

Print Awareness. Print awareness was assessed via Item Set A of the TOPEL. Within the pretest, both subject were unable to complete any of these TOPEL items, and modifications were not used.

Participants were able to complete some of the items at the time of the post-test. Participant 1 was able to complete 10 questions out of 12 in the post assessment. Participant 1 correctly answered 33% (4/12) stimuli. Some examples of items he was able to accurately respond to include the following: "Find the picture that has letters in it," "These are pictures of a book. Which one shows the name of the book?" " Some children wrote stories. Which is the longest story?" and "Which is a letter?" from an array of four choices.

Participant 2 was also able to complete part of Item Set A in the posttest. He completed 5 questions out of 12 in the post assessment before hitting a ceiling. Participant 2 answered 16% (2/12) stimuli correctly. Examples of items he was able to accurately responded to include the following: "Find the picture that has letters in it." and "These are pictures of a book. Which one shows the name of the book?"

Table 1 TOPEL Results	Print Awareness		Letter Recognition	
	Pre-Test	*Post-Test*	*Pre-Test*	*Post Test*
Participant 1	Not Completed	Completed/ Improved	Modified/ Completed	Improved
Participant 2	Not Completed	Completed/ Improved	Modified/ Completed	Not completed

Survey

Both families completed the survey at the time of the pre and post- assessment. Survey responses were organized and reviewed according to their early literacy area. Results for these surveys are first reviewed collectively and then divided by participants. Surveys were completed at the time of the family visits to administer the standardized assessments with the participants. The same caregiver completed the survey in both the pre and posttests. Qualitative assessment of pre and post-survey results were completed following their conclusions.

Overall, both participants saw a general trend of improvements over the 8-week period in which the parent-training period was implemented. Participant 1 and 2 both saw improvements in skills and time allotted to reading books. At the same times, both participants were reported to have little change in the time and skills of language awareness between the pre and post-surveys.

According to the surveys both participants showed a general growth in response to print following the 8-week period. Both participants showed only a moderate growth in

their interest in letters in the pre and post-survey reports. Participant 1 and 2 both showed

a general growth in the interest and skill of writing, although one more so than the other. In

the pre and post-survey there was little change in the amount or interest in television and

computer time. The overall survey results for both participants are detailed in Table 2. The

skills within this table will be discussed that were reported on will be detailed further by

the pre and post-survey reports per participant in the following section.

Area	Questions	Participant 1		Participant 2	
		Pre-Survey	Post-Survey	Pre-Survey	Post-Survey
Reading books	How often do you read to your child	Rarely	Several time per week	Occasionally	Several times per week
	Age you began reading to child	2	2	2	2
	Number of books *your child* owns	0-10	10-25	25-50	25-50
	Number of books *you* own	50-75	25-50	50-75	75-100
	Public library visits	Never	Rarely	Rarely	About once a week
	Does your child comment on pictures while reading	Not yet	Not yet	Not yet	Not yet
	Does your child ask about pictures while reading	Not yet	Has but rarely	Not yet	Not yet
	Does your child pretend to read	Not yet	Not yet	Not yet	Not yet
	While reading well known books, does your child say/sign next word(s)	Not yet	Not yet	Not yet	Not yet
	Doe your child make up stories & tell them	Not yet	Not yet	Not yet	Not yet
	Does your child ask questions about characters or events during reading	Not yet	Not yet	Not yet	Not yet

	Child's interest in books compared to other activities	1	2	5	6
	What you enjoy most about reading with your child	No Response	Routine	His affinity for books	His love for books
Language Awareness	Does child play language games (rhyming, "I Spy", etc.)	Not yet	Have but rarely	Not yet	Have but rarely
Language Awareness	Child tell rhymes, nursery rhymes, skipping rhymes, or playground chants	Not yet	Has but rarely	Not yet	Not yet
Language Awareness	Does child sing simple/popular songs	Daily	Daily	Not yet	Not yet
Response to Print	Do you point out signs in environment	Never	Have but rarely	Several time per week	Never
Response to Print	Does your child read any words by sight	Not yet	Knows a word	Not yet	Not yet
Response to Print	Does your child ask what printed words say	Not yet	Not yet	Not yet	Not yet
Response to Print	Does your child recognize his/her own written name	Not yet	Not yet	Has but rarely	Occasionally
Interest in Letters	Does your child recognize letters of the alphabet	Not yet	Occasionally	Often	Usually
Interest in Letters	Do you attempt to teach names of letters or alphabet sounds	Occasionally	Occasionally	Usually	Usually
Interest in Letters	Does your child recognize/attempt to make sounds for alphabet letters	Not yet	Occasionally	Has but rarely	Not yet
Writing	Does your child draw	Occasionally	Weekly	Occasionally	Occasionally
Writing	Does your child attempt to write letters	Not yet	Occasionally	Occasionally	Occasionally
Writing	Does your child	Not yet	Not yet	Occasionally	Occasionally

	attempt to write words				
	Does your child ask you to write for him/her	Not yet	Not yet	Occasionally	Weekly
	What writing equipment does your child enjoy using	No response	Dry erase board	Crayons & pencils	Markers
Television/Computer	Does your child watch video/DVD stories	Several times per week	Several times per day	No	No
	Does your child watch TV	Several times per week	Several times per week	Several times per day	Several times per day
	Do you have a computer at home	Yes	Yes	Yes	Yes
	Does your child use the computer	No	No	Occasionally	No

Participant 1

Reading Books. Results overall regarding this section showed a trend towards improvement. According to survey results participant 1's parents increased the amount of times of reading to their child from rarely to several times per week. Over the 8-week period the number of the books on the child's level in the home increased from 25-50 to 50-75. Use of the public library also increased. Prior to the training the parents of participant 2 reported using the public library for books never, but in the post survey they reported using the public library rarely.

On the other hand, interaction and communication with books did not significantly change. In both the pre and post surveys the child was reported as not yet independently commenting on pictures, pretending to read a story, saying or signing a word in a familiar book, making up stories , or asking questions during story reading. The only interaction

area that did present with change was asking about pictures. In the pre-survey it was reported that the participant did not ask about pictures, but in the post-survey the participant was reported to asking about pictures rarely.

The level of enjoyment and interest in books increased in the post-survey result. In the pre-survey parents reported reading as the participant's least favorite activity as a 1 on a scale of 1 to 6. In the post-survey the parents increased the rating of enjoyment of reading as a 2 on a scale of 1 to 6. In the pre-survey the parents did not report enjoying anything about shared reading time with their child, but in the post-survey the parents reported enjoying the routine of joint reading time.

Language Awareness. There was a small increase in the time spent on language awareness skills and the skills of participant 1 between pre and post-surveys. In the pre-survey parents reported not yet playing language games with their child, like rhyming games or "I Spy." In the post-survey parents described playing language games, but rarely. Another change between the pre and post survey is that the child had not yet told rhymes, but following the implementation of the training program the child had rarely told nursery rhymes. The nursery rhyme that participant 1 used most often was the alphabet song. In both pre and post survey the parents reported participant 1 as singing simple or popular songs on a daily basis.

Response to Print. The overall exposure and response to print showed a general growth between pre and post-surveys. In the pre-survey the parents had not yet begun pointing out signs and words in the child's environment. In the post-survey the parents had begun to point out words in the child's environment, but were doing so rarely. Prior to the training program the child had not yet read any words by sight whether in his environment

or in books. But in the post-survey the parent recorded that the child knows a word, which was *apple*. In both the pre and post survey there was no change in the child's ability ask what printed words said or recognizing his own written name.

 Interest in Letters. Participant 1's interest in letters showed a moderate growth between the pre and post-survey. The parents reported in the pre-survey that the child did not recognize revealed letters of the alphabet yet and in the post-survey revealed that he could occasionally recognize letters of the alphabet when presented. In both pre and post-surveys the parent detailed attempting to teach the names of letters in the alphabet and/or alphabet sounds when reading or in other activities occasionally. In the pre-survey the parent reported that participant 1 had not yet recognized or attempted to make sounds for the alphabet letters, but in the post-survey he reported that he occasionally recognizes or attempts several letters and sounds.

 Writing. The participant's interest in writing and writing attempts were reported to have a general growth over the 8-week period. Between the pre and post-survey the parents reported an increase in the amount of time the child spent drawing from occasionally to weekly. There was also an increase between the pre and post-survey in the attempts to write letters of the alphabet from not yet to occasionally. In both pre and post-survey the child had not yet attempted to write words or asked the parent to write words for him. In the pre-survey the parent did not detail what writing materials preferred to use, but in the post-survey the parent described that the child enjoyed writing and drawing with a dry erase board and markers.

 Television/Computer. Television and computer time showed little changes in the pre and post-surveys. In the pre-survey the parents reported that the child watched videos and

DVD stories several time per week and this increased in the post-survey to several times per day. The programs that the child watched most included "Frozen" and "Team Umizoomi." The parents also described language videos that the child had begun to watch following the training program that the child greatly enjoyed. In the pre and post-survey there were no changes in how often the child watched TV remaining at several times per week. The family detailed having a computer in the home, but the child did not use it according to both the pre and post-survey results.

Participant 2

Reading Books. Overall skills and time related to book reading showed a general increase between pre and post-survey reports. According to survey results participant 2's parents increased the amount of times of reading to their child from occasionally to several times per week. Prior to the training the parents reported rarely using the public library for book for their child, but in the post-survey they increased usage of the library to about once a week. Over the 8 week training period the parents reported no changes in the child's ability to independently comment on pictures when reading stories together, asking about pictures when reading stories together, pretending to read the story in the book, making up stories and telling them, or asking questions about characters or events during story reading. The survey did identify that reading had increased as one of the child's favorite activities on a scale of 1 to 6. The reported survey says that reading as a chosen activity increased from a 5 to a 6 following the 8-week period.

Language Awareness. Language awareness abilities showed little change between pre and post-survey reports. Participant 2's parents reported increasing the amount of language games played in the home over the 8-week period from not yet to rarely. The

subject's parents reported that participant 2 showed no changes in not yet telling rhymes or singing simple songs.

Response to Print. The overall exposure and response to print for participant 2 mixed improvement between pre and post-surveys. Parents of participant 2 reported an increase in pointing out words in the child's environment from never to several times per week (restaurant names, street signs, etc.). According to the survey participant 2 has not showed any changes in reading sight words in his environment or in books or in asking what printed words say. The parents of participant 2 did report that the child recognizes his name occasionally following the 8-week period when this skill was rarely present before the training program.

Interest in Letters. There was a moderate increase in the interest in letters between pre and post-survey for participant 2. In the pre-survey the parents reported participant 2 recognizing letters of the alphabet often. In the post-survey the parents reported that participant 2 could usually recognize letters of the alphabet. In pre and post- survey the parents report usually attempting to teach the names of letters in the alphabet and/or alphabet sounds when reading or in other activities.

Writing. The participant's interest in writing and writing attempts were reported to have a moderate growth over the 8-week period. In the pre and post survey the parent report that participant 2 occasionally drew and attempted to write letters of the alphabet. The child was reported as requesting the parents to write for him occasionally prior to the implementation of the training. This increased to weekly following the implementation of the training.

Television/Computer. Television and computer time showed no changes in the pre and post-surveys. In both pre and post-surveys the parents reported that participant 2 does not watch any DVD or videos at home, but does watch TV programs for 2-3 hours a day. The TV programs that participant 2 prefers included Bubble Guppies and Team Umizoomi.

Chapter 5

Discussion

The TOPEL and caregiver survey results identified an improvement in some

emergent literacy for the participants in the pre and posttests. There were also some

observed differences in the participants during the posttest.

The answer to the first research question is yes based on survey and TOPEL

results. Emergent literacy skills appeared to increase following the implementation of the

parent-training program.

The answer to the second research question is yes based on the report given by the

caregivers via the survey. The caregivers did report that they noticed a difference in their

child's emergent literacy skills based on their response to the survey questions.

The caregiver of participant 1 completed the application of literacy activities three

times a week for 30 minutes based on self-report. The Activities reported to be completed

at home were joint book reading between the father and participant 1 as well as the use of

an alphabet song via YouTube.

The caregiver of participant 2 also completed the application of literacy activities

three times a week for 30 minutes based on self-report. The activities reported to be

completed at home included joint book reading between dad and participant 2 and letter

games. Participant 2 showed slight improvement between pre and posttest both in the

standardized assessments and in the caregiver report within the survey.

TOPEL Overall

Emergent literacy skills appeared to have made a general improvement based on

the TOPEL for both participants. In the pretest neither participant was able to attend to the

assessment items for any presentations of in either the print awareness or the letter recognition subtests. Yet, but in the posttest both attempted and answered portions correctly. The improvement in emergent literacy skills, attention, and use of a work-reward system are developing in both children.

Both participants displayed improvements in their print awareness. Both participants demonstrated the ability to distinguish print from pictures, numbers, and symbols. The understanding that print holds meaning and is present in our environment is a foundational skill that emerges from birth to two for typically developing children. This early developing skill will allow both participants to continue to develop necessary literacy skills in the future.

Participant 1 TOPEL. Participant 1 showed improvement between pre and posttest in the standardized assessments. Participant 1 struggled to complete any structured tasks during the pretest. In the posttest participant 1 demonstrated the ability to establish a work-reward system with the clinicians and improve his attention. His completion of the TOPEL during the post-test allowed for some criterion-based assessment of his literacy development.

During the pre and posttest participant 1's behaviors limited the assessment completion. In the pretest participant 1 displayed a short attention span and a lack of a work-reward system. The participant's observed behaviors included hitting, spitting, grabbing, and crying. The pre and posttests both required the presence of the parent to support positive behavior.

Although participant 1 pretest presented with numerous limitations, he was able to attend to the adapted assessment for letter recognition for two presentations. In the

pretest he was able to accurately physically identify the letter *R* out of an array of *R* and *G* as well as *K* in an array of *K* and *Z*. Following the presentation of two letters, participant 1 would no longer attend to the task and refused any further activities.

In the posttest participant 1 was able to follow a supported work-reward system. Participant 1 was able to attend to the TOPEL for an extended amount of time, which was an improvement from the pretest.

In the post-test participant 1 correctly identified four letter from an array in Item Set A. Item Set A addressed the participant's ability to distinguish print from pictures, numbers, and symbols. This demonstrates that the participant was developing print knowledge, which is an area of phonological awareness. Print awareness is one of the first developing skills in literacy development. Print awareness typically develops from birth to age two. Print awareness is a sign that an individual is beginning to recognize that letters and symbols carry a meaning. This is an important step in literacy development (McLaughlin, 2007).

Item set B is another assessment of print knowledge. Item set B assessed participant 1's ability to identify a verbally given letter. Participant 1 was able to identify two letters, showing that is an emerging skill. The ability to recognize and name letters of the alphabet is an ability that develops between two to five years of age. Knowing the names of letters is a prerequisite skill to knowing the sounds that letters make. This is yet another important stepping-stone in literacy development (McLaughlin, 2007).

Participant 2 TOPEL. Participant 2 struggled to complete any structured tasks during the pretest and posttest. Within the pretest he demonstrated ritualistic behaviors with the assessment booklet and other texts provided in the room. These behaviors

included flipping the pages of the book rather than attending to the images and text on the page. The caregiver reported this behavior as typical interaction with texts for their child.

In the pre-test participant 2 did not attend to any TOPEL items. At the same time, he did participate in the modified letter recognition task with the application of a work-reward system. The pre-test modified letter recognition task showed some emerging letter recognition skills. Participant 2 was able to identify about 90% of letters presented in a structured array of 2. As previously stated the ability to recognize and name letters of the alphabet is a skill that develops between 2 to 5 years of age. Knowing the names of letters is a foundational skill to knowing the sounds that letters make. This is yet another important stepping-stone in literacy development.

In the post-test Participant 2 attended to Item Set A of the TOPEL, which targeted print awareness, but he was not compliant for completing Item Set B. His negative behaviors included physical and gestural refusals as well as screaming. The participant began the assessment attending to the task, but then presented with perseverative responses. He began to select choice A as a response for every question presented. The first two question the participant 2 attended to were answered correctly.

Print awareness is a sign that an individual is beginning to recognize that letters and symbols carry a meaning. This is an important step in literacy development. Participant 2 did show further improvement based on caregiver survey (Kaderavek, 2015).

Survey and Observations Overall

The survey revealed a plethora of areas that the participants demonstrated increased progress. These gains were found to present with some general themes, including the overall target of improvement in emergent literacy skills following the

implementation of the parent-training program. Both participants saw development in the literacy areas of reading books, language awareness, and interest in letters as seen in *Table 2*. Participant 1 and 2 both increased reading time with a literate partner to several times per week. This increase in joint reading lead to increases in emergent literacy skills. Participant 1 and 2 both increased the amount of times they visited the public library. Trips to the library allow the participants to have more independence in selecting texts to take home. This independence allowed them to choose text more tailored to their interests. If the book reading is directed toward entertainment based on individual interest it can increase the attention to the pictures and text (Kaderavek, 2015).

Another area the survey showing an increase for both participants was the number of books that the caregivers own within the home. If children have a model of how to interact with text and the joy that reading can bring in can encourage more interest. The model is yet another way to increase the emergent literacy skills of the participants. The interest level in books compared to other activities also increased for both participants from the pre to post-survey. The increased interested can lead to increased interaction so that further emergent literacy skills are established (Kaderavek, 2015).

Language awareness, in the form of routine-based language games, also increased for both participants. These language games, such as rhyming, increased in the home from 'not yet' to 'rarely' occurring for both participants. Rhyming is an important area of development in literacy, particularly phonological awareness. Rhyme awareness begins from birth to two years of age and leads into the production of rhymes from two to five years of age (McLaughlin, 2007).

Lastly, both participants saw an increase in the area of recognizing letters of the alphabet. An increase in letter recognition is part of print knowledge development. This emergent literacy is a foundational skill to learning the sounds that letters make. This skill of recognizing letters is another skill that typically develops from two to five years of age.

Improvement in print knowledge is another example of how the participants advanced in the area of emergent literacy. Both participants showed varying levels of improvement in early literacy skills based on caregiver report throughout the pre and post-surveys. Overall, the increased literacy time within the parent- training program increased the participant's literacy skills.

Participant 1 Survey and Observations. Through report from participant 1's caregiver a change in literacy exposure and abilities were noted. Participant 1's caregiver was happy to report an increase in routines within the home and an increase of the participant's excitement about literacy time. In notes from participant 1's caregiver, he commented about participant 1's progress with literacy time at home over the 8-week period.

> "To start off [Participant 1] would not sit still for me to read with him. I sat for 10 minutes with him and he would spend most of the time kicking and fighting to get loose. He really wasn't paying attention to the books at all, and I spent the first week and most of the second week on the same book. When I finished reading to him I would let him watch the alphabet song on YouTube…Over time [Participant 1] got a little better with the routine. I would sit with him and read for about 20 minutes. He would sit still with me. He never did repeat words and sounds when prompted. Every time after I

read to him I would turn on a YouTube video…Music has always been a

constant to keep [Participant 1's] attention."

Reading Books. The survey revealed the number of age appropriate texts participant

1 had access to in the home increased from 1-10 to 10-25. This allowed for increased

opportunities for participant 1 to interact with texts, which has the potential to increase

literacy skills. During the reading activities improved in his interaction with texts by asking

about pictures in the text. This was not present in the pre-survey, but was reported as an

emerging skill in the post-survey. This is further evidence that participant 1 is interacting

with texts and developing literacy skills.

Participant 1's caregiver also reported an increase in visits to the public library from

never to rarely. Visits to the library will also allow the participant to independently choose

texts that are more desired. Visiting the public library is a way to increase a child's interest

in text and see peers interacting in a positive way with text as well, both of which promote

literacy development.

Language Awareness. In pre-survey report participant 1 was not yet playing

language games such as rhyming. In the post survey the caregiver reported an increase in

language games at home, playing them rarely. The increase in rhyming games is a way to

advance phonological awareness skills for literacy development. At 30-36 months the

ability to produce a rhyming word typically emerges. This is an early skill of phonological

awareness that is still developing for participant 1 (McLaughlin, 2007).

The increased use of rhyming games at home goes hand and hand with the reported

development of the subject's use of rhymes, nursery rhymes, or playground chants. In the

pre-survey the child had not yet demonstrated this skill, but in the post-survey the

caregiver reports that the child rarely produced such rhymes. Continued exposure to rhyming games at home should aid in the continued emergence of the skill. There was no change in the frequency that the child sings simple or popular songs at home, which remained daily.

Response to Print. Other improvements in the subject's literacy development included letter knowledge. In the pre-survey participant 1's caregiver reported that he was not yet recognizing or attempting to make sounds for alphabet letters. In the post survey the caregiver reported that he repeats several letters and sounds during the alphabet video used at home.

The post-survey also showed an increase in the child's recognition of letters of the alphabet. In the pre-survey he was not yet able to recognize any, but in the post survey dad reported that he could recognize letters *A*, *B*, and *C*.

Word recognition also demonstrated some growth. The pre-survey reported that participant 1 did not yet know any words, but following the application of the training program his dad reported that he knows a word, which is apple. When asked what word starts with "a" he is able to respond "apple" based on caregiver report.

Interest in Letters. Learning the alphabet song is a skill that typically develops between two to five years of age. Participant 1 being able to identify "a" is for "apple" is a major step in literacy development. The presence of these new skills shows that participant 1 is becoming aware that letters represent sounds. Knowing that letters represent specific sounds leads into the skill of being able to blend sounds together in early reading (Kaderavek, 2015).

Writing. According to survey reports another skill that showed an increase in literacy skills were participant 1's attempts to write. In the pre-survey the caregiver did not report participant 1 using any writing materials. In the post-survey the caregiver reported he enjoyed using a dry erase board. In looking at other orthographic development, in the pre-survey participant 1 was only occasionally drawing, but in the post-survey dad reported that he was drawing weekly now. The final pre-writing skill that changed in pre and post-surveys was that participant 1 had not yet attempted to write letters of the alphabet, but was now occasionally attempting.

Distinguishing drawing from writing is a skill that typically develops from two to five years of age. Participant 1 developing the skill of occasionally attempting to write letter is another demonstration of his awareness of letters holding meaning. The increased interest in writing letters is a sign of increasing exposure to texts and literacy skills (Kaderavek, 2015).

Additional Observations. During the pretest participant 1 showed a lack of interest in the provided toys, such as cause and effect toys, interactive books, and stuffed animals. In the posttest, some play skills were observed to have developed. Participant 1 showed interest in a stuffed puppet and would imitate imaginative and functional play. Participant 1 would also imitate the appropriate skills to operate cause and affect toys within the posttest. Participant 1 also displayed the skill of a verbal repetition during play activities within the posttest, which were not noted in the pretest.

Regarding the overall changes over the course of the study, Participant 1 was showing signs of increased phonological awareness based on assessment results, survey reports, and observations during the assessment time. The caregiver also reported seeing an

improvement in skills at home, which was exciting to him, Participant 1's father stated, "I like that [he] is getting in a routine with me."

Participant 2 Survey and Observations

Through the survey response and reports from participant 1's caregiver a change in literacy exposure and abilities were noted. Participant 2's mom and dad were both eager to share improvements noted at home within the survey as well as in conversations. Participant 2's caregivers enthusiastically reported that their child was beginning to allow joint reading instead of ritualistically flipping the pages of books. Joint reading is a literacy socialization skill that typically emerges from birth to age two (McLaughlin, 2007). The attention to texts is a beneficial way for participant 2 to gain the appropriate foundational skills to build literacy development on. Other changes in literacy development were noted throughout the caregiver survey (Kaderavek, 2015).

Reading Books. By the end of the study, the frequency of joint book reading at home increased for participant 2 from occasionally to several times a week. Due to participant 2's already formed interest in texts the number of child appropriate texts in the home did not increase, but remained the same at 25-50.

Another literacy development included an increase in public library visits. The caregivers of participant 2 reported library visits as an enjoyable activity for both their child and themselves. The trips to the library are a way for participant 2 to chose the texts that he desires and allowing joint interactions.

At the same time, some literacy skills did not change. The child was not reported to change in his ability to comment on pictures, ask about pictures, pretend to read, say or

sign next line of familiar texts, make up stories and tell them, or ask about characters of events during reading.

Although there were not any changes in a number of skills, participant 2's caregivers reported some important changes. He was beginning to take the literacy partners hand and point to the words of the text as they were reading. This showed an emerging awareness of how text flows from left to right, which typically emerges from ages two to five. This could also be a sign of emerging skills that print is what you read. This is another literacy skill that emerges from ages two to five. These are important foundational skills in literacy development to build further literacy skills on (Kaderavek, 2015).

According to the survey reports participant 2's interest in book compared to other activities increased from a 5 to a 6 on a 1 to 6 scale. This means that reading was participant 2's favorite activity compared to all others. Participant 2's caregiver stated that what he enjoys most about reading with his child is his obvious love for books.

Language Awareness. In the pre-survey the caregiver did not report playing any language games or rhyming games with participant 2 at home. In the post-survey this was reported to have increased to rarely playing them at home. There was minimal improvement in the areas of language for participant 2. He did not have any changes in telling rhymes or singing simple/ popular songs.

Response to Print. Based on pre and post-survey results, minimal improvement and some regression was seen in participant 2's response to print. The frequency of pointing out signs in the environment was reported to have decreased from several times per week to never. Pointing out signs in the environment is yet another way to bring attention to print and its importance and meaning, but there was no reported change in this ability. .

One area of improvement noted was participant 2's ability to recognize his own name. Learning to recognize the letters in one's name is a skill that emerges between the ages of two and five (McLaughin, 2007). In the pre-survey it was reported that he had began to recognize his name, but rarely. In the post-survey he was occasionally able to recognize his own name. Participant 2's mom was excited to share a video of him using magnet letters to independently spell his name.

Interest in Letters. The interest and knowledge of letters had a small improvement for participant 2 based on the survey reports. In the post-survey participant 2 increased letters recognition from often to usually. With continued literacy activities and skill development this ability could reach proficiency.

There were other letter skills that remained the same or decreased. Participant 2's caregivers did not report an increase of their attempt to teach their child letters or alphabet sounds, and these skills remained static. There was also a reported decrease in the frequency of participant 2's recognition and attempt to make sounds for letters from rarely to not yet.

Writing. There was also a no increase in participant 2's writing skills. Participant 2 did not have any changes in his attempts to draw, write letters, or write words. They all remained 'occasionally'.

There was an increase in participant 2's requests for assistance in writing from occasionally to weekly. This could be a sign of his increased in interest in writing. Based on caregiver report the desired writing utensils shifted from crayons and pencils to markers. This could be participant 2 gaining more experience with writing equipment and exploring a variety of options due to increased exposure.

Additional Observations. In the pretest it appeared that participant 2 enjoyed books, but mainly for the ritualistic behavior of page turning. In the posttest process participant 2's focus began to shift from page turning to interacting more appropriately with texts.

His attention to the pictures and printed words showed an improvement. Based on caregiver report, they saw an increase with attention, appropriate responses, and attention during joint reading activities. The caregivers reported that the implication of the caregiver training provided the family with another functional activity to apply at home and it provided the public library as an enjoyable family activity.

Limitations

A major limitation of study was the inability to collect a variety of participants. Due to the lack of variety in the western Kentucky region finding willing participants who were well versed with AAC was challenging. Another limitation within this study was the length of time allowed to implement the parent-training program. The limited time did not allow for changes to be fully developed.

Standardized testing in the pre and posttests could not be conducted to completion. The participants of this study were not able to attend to standardized testing due to poor attention, inability to attend to a work-reward system, and challenging behaviors. The TOPEL was unable to be assessed using the Wilcoxon Signed Rank Test due to lack of participation. Both participants were also new to the use of their AAC devices, causing more challenges for a focus on literacy interventions.

Considerations for Future Research

Future research should include a variety of participants that are well versed and have more experience with their AAC system. One aspect to consider in future research is

to provide an increased length of time for the application of changes to be observed and assessed. In addition it could provide the length of time that a program should be implemented for changes to be developed. The literacy interventions could include more guided instructions and directions given via direct therapy. More direct instruction could result in greater improvements in a shorter length of time.

Summary and Conclusions

Overall, this study provided limited evidence that a parent-training program targeting literacy time for AAC users results in improvement of emergent literacy skills. Despite limited information via standardized assessment, the caregiver survey provided some positive results. The subjects did make improvements in emergent literacy skills based on caregiver reports. Overall, the results were not dramatic, but there was a general improvement based on improved ability to attend to the assessments, observations, and caregiver report.

Appendix A

If you have any questions about the study, please feel free to contact me via email at mbowers1@murraystate.edu or the supervisor of this research, Dr. Karen Coulter at kcoulter@murraystate.edu. If you have questions regarding your rights as a research subject, please contact the IRB Review Board at Murray State University at msu.irb@murraystate.edu. You will be offered a copy of this form to keep.

Sincerely,

Meghan Bowers
Graduate Clinician at Murray State University

*By signing below you are saying, "I consent to be in this study with my child. Your signature indicates that you have read and understand the information provided above, that you willingly agree to allow your child to participate, that you and/or your child may withdraw your consent at any time and discontinue participation without penalty, that you will receive a copy of this form, and that you are not waiving any legal claims."
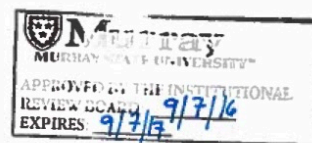
_____
Childs Name (Print)

_____
Caregiver's Name Print

_____
Caregiver Signature

_____
Date

_____   _____
Phone number   Email Address

Appendix B

Study on Caregiver Training Program for AAC Users

Who?

Meghan Bowers is a graduate student completing a thesis at Murray State University in the Department for Communication Disorders. She is studying to be a Speech-Language Pathologist. Dr. Karen Coulter, a graduate professor in the Department for Communication Disorders, is supervising Meghan.

What?

We are looking for caregivers of children who use augmentative and alternative communication (AAC) devices. The training program will teach you ways to improve your child's ability to read. Prior to the training you will complete a survey on your involvement and thoughts on your child reading involvement and your child's reading skills will be evaluated by an assessment. The same survey and assessment will be completed again following the training program and 8 weeks time to apply the tips from the training program.

When?

Training and pre data collection will begin in the fall of 2016. Following the 8-week period to apply the training post data collection will be completed.

If you are interested in participation or would like more information please contact Meghan Bowers at mbowers1@murraystate.edu or Dr. Karen Coulter at kcoulter@murraystate.edu.

Appendix C

Caregiver Training
Program for
AAC and Literacy

Meghan Bowers
Dr. Karen Coulter

Fall 2016

What is Literacy?

Literacy is known as a "learner's capacity to use a complex set of abilities to identify, understand, interpret, create, communicate, and compute printed and written materials that include alphabetical signs, visual icons, and graphic and tactile symbols" (Balkhom, 2010, p.149).

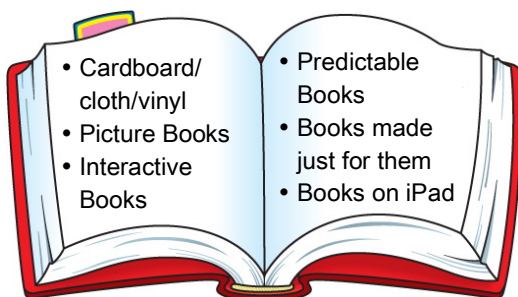## Introduction to Our Program and Literacy

Literacy learning for children begins from birth. When children see their parents interact with marks on paper, they typically begin to understand that these marks mean something and want to learn for themselves (Weitzman & Greenberg, 2002). For children with complex communication needs literacy learning can be a challenge. Activities of daily living often require more of the caregivers' time and literacy is one of the skills that becomes forgotten. "An estimated 2 million Americans have significant communication disabilities and require augmentative and alternative communication (AAC)" devices (Light, 2003, p. 4).

Developing literacy skills will provide your AAC users with an outlet for educational opportunities, vocational opportunities, self-expression, potential for independent living, entertainment, and prevention of communication breakdowns in face-to-face conversations (Erickson, 2003). We are so happy and grateful for your participation in this program and we truly look forward to working with you!

Literacy Skills to Implement with AAC Users

As a parent you will be capable of increasing your child's literacy skills. Literacy acquisition is achieved via repetition, consistency, and active participation in a wide array of authentic literacy tasks (Strum et. al., 2006). Before a child is taught the skills of literacy the foundations of literacy abilities are established through emergent literacy. Emergent Literacy is defined as literacy skills that are introduced from birth; well before the skills of reading and writing Emergent literacy includes developing skills through exposure to print in daily routines, interacting with text, questions related to text, and story retelling. (Roth, Paul & Pierotti, 2006). Typically developing children are provided opportunities to spend time with books of their choosing on a daily basis during their literacy education at home with parents or caregivers (Strum et. al., 2006). This program is seeking to provide your children with these same opportunities.

To supply your child with the appropriate exposure to text, you must first enhance your child's literacy environment. It is necessary to find what texts your child best interacts with, such as:

- Cardboard/cloth/vinyl
- Picture Books
- Interactive Books
- Predictable Books
- Books made just for them
- Books on iPad

When interacting with your text make sure your child is interacting with the text as well. If motor skills are impaired, you can give physical assistance to point to the pictures, or following along with the text as you read.

Other options for motor impairments could be implementing texts via an iPad. There are a variety of options for premade texts online or you can make your own text centered on your child and their interests. Some of these options include:

- Tarheel Reader
- Cast Online Books
- Magic Keys
- Capstone

Making sure your child has access to these texts independently can also improve their environment. Another way to improve your child's literacy environment is to point out letters, words, and symbols in daily life events.

Lastly, encouraging a good attitude toward literacy is essential. When reading it is important to use proper expressions and reading techniques. When children see your excitement about reading it will help develop their positive attitudes about reading (Weitzman & Greenberg, 2002). Using an expressive voice and facial expressions will add to the excitement.

What to do During Reading Activities?
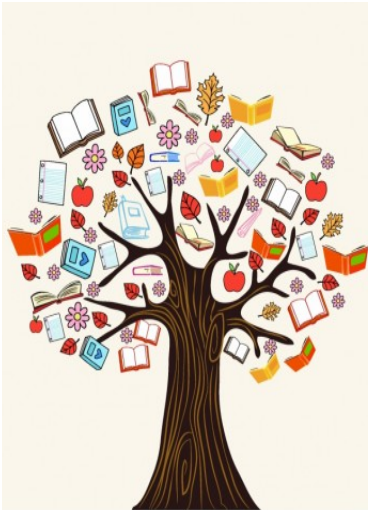
How to Record Literacy Participation

We have included monthly calendars and stickers, so you will be able to record the days in which literacy activities are achieved. This will allow a visual way to keep your child involved in the program and another way for us to record your participation. There is an area on the calendars for any notes that you would care to share with us along this journey.

For this study we ask that as caregivers you are providing consistent and repeated literacy instructions for your child. We ask that you participate in shared book reading with your child three times a week for 30 minutes. Reading activities can be via any of the technologies discussed above (hard copy books, iPad, etc.) and involving participation of your child either by verbal or AAC device responses.

During The Reading activities it is important to allow your child to engage, either with verbal response or with the use of their AAC devise. To achieve this you must:

- Use a slow pace
- Allow appropriate time for a response
- Wait expectantly
- Use turn taking skills
- Explain things your child might not understand wither verbally or using their device
- Connect the topics to your child's life

(Weitzman & Greenberg, 2002)

Once again we thank you for your participation in this study! We hope you enjoy implementing these literacy activities with your child at home!

References

Erickson, K. (2003). Reading comprehension in AAC. *American Speech-Language-Hearing Association,* 6-9.

Literacy [Digital image]. (n.d.). Retrieved May 2, 2016, from
https://www.thinglink.com/scene/546139764835745794

Open Book Image #1 [Digital image]. (n.d.). Retrieved May 2, 2016, from WorldArtsMe

Strum, J., Spadorcia, S., Cunningham, J., Cali, K., Staples, A., Karen Erickson, K., . . . Koppenhaver, D. (2006). What happens to reading between first and third grade? Implications for students who use AAC. *Augmentative and Alternative Communication, 22*(1), 21-36.

[Thought Bubble with Reading Boy]. (n.d.). Retrieved May 2, 2016, from
https://openclipart.org/image/2400px/svg_to_png/219987/reading.png

Roth, F. P., Paul, D. R., & Pierotti, A. (2006). Emergent titeracy: let's talk for people with special communication needs. Retrieved March 07, 2016, from
http://www.asha.org/public/speech/emergent-literacy/

Weitzman, E. & J. Greenberg. (2002). Let language lead the way to literacy. Learning language and loving it: A guide to promoting children's social, language, and literacy development in early child hood settings (2nd ed., pp. 322-371). Toronto, ON: The Hanen Program.

Appendix D

Developing Literacy Questionnaire

(return by Friday 22nd June 2012)

Your name: _____

Your address: _____

_____

_____

Contact phone number: _____

Your child's Date of birth: _____

Today's date: _____   **Is your child a girl or a boy?** _____

This questionnaire is divided into sections with each section containing questions about a different area of early literacy. Please answer as many questions as you can.

We expect that families will have a range of responses to these questions and children will be at different points in their development of literacy. So, do not be concerned if your child is not doing some of the things here.

We have generally placed questions about earlier developing skills towards the beginning of each section with questions about later developing skills towards the end of each section.

Reading Books

1) How often do you read to your child? (please circle one)

    Never/rarely   Occasionally   Weekly   Several times per week   Daily   Several times per day

2) At what age did you begin reading to/wish your child? _____

3) How many books does <u>your child</u> own (approximately)? (Please circle one)

   0-10   10-25   25-50   50-75   75-100   over 100

4) How many books do you own (approximately)? (Please circle one)

   0-10   10-25   25-50   50-75   75-100   over 100

5) How often do you use the public library for books for your child? (please circle one)

   Never   Rarely   about once a month   about once a week

6) Does your child <u>comment on</u> pictures without being prompted when you read stories together (please circle one)

   Not yet   Has but rarely   Occasionally   A few times per story   Often during story   Usually?

7) Does your child <u>ask about</u> pictures without being prompted when you read stories together? (please circle one)

   Not yet   Has but rarely   Occasionally   A few times per story   Often during story   Usually

8) Does your child <u>pretend to read</u> the story in a book such as sitting with a book and producing speech that is similar to the actual story in the book? (please circle one)

   Not yet   Has but rarely   Occasionally   A few times per story   Often during story   Usually

9) When you read a book with your child he/she knows well, does he/she say or sign the next word or line before you read it?. (please circle one)

   Not yet   Has but rarely   Occasionally   A few times per story   Often during story   Usually

10) Does your child make up stories and tell them? (please circle one)

   Not yet   Has but rarely   Occasionally   A few times per story   Often during story   Usually

11) Does your child ask questions about characters or events during story reading? (please circle one)

   Not yet   Has but rarely   Occasionally   A few times per story   Often during story   Usually

12) In comparison to other activities, how would you rate your child's interest in books? (please circle a number)

   1   2   3   4   5   6
   Least Favourite activity   Favourite activity

13) What do <u>you</u> enjoy most about reading with your child? _____

Language Awareness

14) Do you play language games with your child such as rhyming games, "I spy"etc? (please circle one)

   Not yet   Have but rarely   Occasionally   Weekly   Several times per week Daily

   If yes, what sort of games do you play?_____

15) Does your child tell rhymes such as nursery rhymes, skipping rhymes, or playground chants? (please circle one.)

   Not yet   Has but rarely   Occasionally   Weekly   Several times per week Daily

   What are some of the rhymes he/she knows?
   _____

16) Does your child sing simple or popular songs or waiata? (please circle one)

   Not yet   Has but rarely   Occasionally   Weekly   Several times per week Daily

   What are some of her/his favourites?_____

Response to Print

17) Do you point out signs and words such as restaurant names and street signs to your child (e.g. McDonalds, Main Street, Westfield etc)? (please circle one)

   Never   Have but rarely   Occasionally   Weekly   Several times per week   Daily

18) Does your child read any words by sight, either in the environment (such as Weetbix, McDonalds, etc.) or in books etc. (e.g., Mum, cat, etc.)? (Please circle one.)

   Not yet   Knows a word   a few words   several words   many words

   What signs or words does your child read? _____

   _____

   (list other words on the back of this questionnaire as needed)

19) Does your child ask what printed words say, such as signs on the street or words on food packets? (please circle one)

   Not yet   Has but rarely   Occasionally   Weekly   Several times per week Daily

20) Does your child recognise his or her own written name? (Please circle one.)

   Not yet   Has but rarely   Occasionally   Often   Usually   Always

Interest in Letters

21) Does your child recognise letters of the alphabet? (e.g., pointing to the letter "A" when you ask him/her to?) (Please circle one)

   Not yet   Has but rarely   Occasionally   Often   Usually   Always

    If yes, which letter names does he/she know? _____

22) Do you attempt to teach the names of letters in the alphabet and/or alphabet sounds when reading or in other activities? (please circle one.)

   Not yet   Have but rarely   Occasionally Often   Usually

23) Does your child recognise and/or attempt to make sounds for alphabet letters? (Please circle one.)

   Not yet   Has but rarely   Occasionally   Often   Usually   Always

    If yes, which letter sounds does he/she know? _____

Writing

24) Does your child draw? (Please circle one.)

   Not yet   Occasionally   Weekly Several times per week   Daily   Several times per day

25) Does your child attempt to <u>write letters</u> of the alphabet? (Please circle one.)

   Not yet   Occasionally   Weekly Several times per week   Daily   Several times per day

26) Does your child attempt to <u>write words</u> (such as their own name, sequences of letters)? (Please circle one.)

   Not yet   occasionally   Weekly Several times per week   Daily   Several times per day

27) Does your child ask you to write for him/her? (Please circle one.)

   Not yet   Occasionally   Weekly Several times per week   Daily   Several times per day

28) What writing equipment does your child enjoy using (crayons, chalk, felt pens, pens, scrap book, etc.) _____

Television/Computer

29) Does your child watch video/DVD stories on a VCR/DVD? (e.g. Lion King or other stories) (Please circle one.)

   No   Occasionally   Weekly Several times per week   Daily   Several times per day

    How many hours per week does she/he watch them? _____

    Does your child own any stories on video/DVD, and if so, which ones? _____

_____

30) Does your child watch TV? (Please circle one.)

    No   *Occasionally*   *Weekly*   *Several times per week*   *Daily*   *Several times per day*

How many hours per day? _____

What is the show watched most frequently? _____

31) Do you have a computer at home?

If so, does your child use it?

Average number of hours per week? _____

What computer programmes does he/she enjoy? _____

_____

32) What do you rate as the most important skill/s that your child will learn when he/she goes to school? (e.g. reading, writing, maths, social skills, physical education, arts and crafts, music…)

Please list them in order of importance _____

_____

_____

If you have any further comments you would like to make please do so here.

_____

_____

_____

_____

_____

Thank you very much for completing this questionnaire.

Please return by <u>Friday 22nd June, 2012</u> to:

Dr. Anne van Bysterveldt
Health Sciences Centre
College of Education
University of Canterbury
Private bag 4800
Christchurch 8140

References

Augmentative and Alternative Communication (AAC). (2016). Retrieved March 07, 2016, from

    http://www.asha.org/NJC/AAC

Balkhom, H., & Verhoeven, L. (2010). Literacy learning in users of AAC: A neurocognitive

    perspective. *Augmentative and Alternative Communication, 26*, 149-157.

Beukelman, D., & Mirenda, P. (2013). *Augmentative and Alternative Communication:*

    Supporting Children and Adults with Complex Communication Needs (4th ed.).

    Baltimore: Paul H. Brookes Pub.

Clendon, S. (2011). Literacy interventions for students who use aided augmentative and

    alternative communication: More work to be done. *Evidence-Based Communication*

    Assessment and Intervention, 5, 138-143.

Erickson, K. (2003). Reading comprehension in AAC. *American Speech-Language-Hearing*

    Association 8, (6-9).

Fallon, K., & Katz, L. (2008). Augmentative and alternative communication and literacy teams:

    Facing the challenges, forging ahead. *Seminars in Speech and Language,* 112-119.

Kaderavek, J. N. (2015). *Language Disorders in Children: Fundamental Concepts of Assessment*

    and Intervention (2nd ed). Boston: Pearson.

Light, J., & Kelford-Smith, A. (1993). Home literacy experiences of preschoolers who use AAC

    systems and of their nondisabled peers. Augmentative and Alternative Communication,

    9, 10-25.

Light, J., & Kent- Walsh, J. (2003). Fostering emergent literacy for children who require AAC.

    American Speech-Language-Hearing Association, 4-29.

Light, J., & Mcnaughton, D. (2012). Supporting the communication, language, and literacy

    development of children with complex communication needs: State of the science and

    future research priorities. *Assistive Technology,* 34-44.

Lonigan, C. J., Wagner, R. K., & Torgesen, J. K. (2007). *Test of Preschool Early Literacy:*

    Examiner's Manual. Austin, TX: Pro-Ed.

McLaughlin, S. (2007). *Introduction to Language Development* (2nd ed.). University of Central

    Oklahoma: Edmond.

Nelson, L. K. (2013). *Research in Communication Sciences and Disorders: Methods for*

    Systematic Inquiry (2nd ed.). San Diego: Plural.

Pufpaff, L. (2008). Barriers to participation in kindergarten literacy instruction for a student with

    augmentative and alternative communication needs. *Psychology in the Schools, 47*(7),

    582-599.

Reed, V. (2012). *An Introduction to Children with Language Disorders* (4th ed.). New York:

    Macmillan.

Roth, F. P., Paul, D. R., & Pierotti, A. (2006). Emergent literacy: Let's talk for people with

    special communication needs. Retrieved March 07, 2016, from

    http://www.asha.org/public/speech/emergent-literacy/

Sandberg, A., Smith, M., & Larsson, M. (2010). An analysis of reading and spelling abilities of

    children using AAC: Understanding a continuum of competence. *Augmentative and*

    Alternative Communication, 26(3), 191-202.

Spracher, M. M. (2000). Learning about literacy: SLPs play key role in reading, writing. *The*

    ASHA Leader, *5*(1), 19th ser. Retrieved March 7, 2016, from

    http://leader.pubs.asha.org/article.aspx?articleid=2292588

Strum, J., Spadorcia, S., Cunningham, J., Cali, K., Staples, A., Karen Erickson, K., . . .

    Koppenhaver, D. (2006). What happens to reading between first and third grade?

    Implications for students who use AAC. *Augmentative and Alternative Communication,*

    22(1), 21-36.

What is a Speech Language Pathologist (SLP)? (2016). Retrieved March 07, 2016, from

    http://www.redlands.edu/academics/college-of-arts-sciences/undergraduate-

    studies/communicative-disorders/4580.aspx#.Vt2urscfVAY

Wilcoxon Signed-Rank Test using SPSS Statistics. (n.d.). Retrieved August 04, 2016, from

    https://statistics.laerd.com/spss-tutorials/wilcoxon-signed-rank-test-using-spss-

    statistics.php