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**Is Early Intervention an Effective Method for Preventing
Language Deficits in Children with Hearing Loss?**

Jessica O'Connell

Sacred Heart University

Abstract

The presence of hearing loss can cause severe detriments to a child's ability to develop efficient communication skills, which can affect the ability to adopt normal social and educational skills. However, it has been suggested that intervening at a young age can diminish these delays. Several research studies have been conducted to discuss the validity of whether early intervention (EI) yields positive results on communication skills in children who have some degree of hearing loss. The participants, who were utilized in the conducted research, were all placed into intervention programs of different degrees in early stages of their lives. The specific way in which this research was conducted was to look at the effects of not only how early the intervention programs began but also the time in which it was discovered that the child had a degree of hearing loss. Communication abilities were assessed over periods of times to examine improvements and these results were compared to others who had no hearing loss to see if the development was on target with specific ages. Both intervention methods in a group setting as well as individual sessions have been deemed effective. The data concluded through different research studies can be examined to evaluate the efficiency of these intervention programs, and an individual's improvements in regards to expressive and/or receptive language abilities.

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Introduction

Language refers to all spoken, and signed forms of languages. At a young age, a child may present with signs of a possible language delay, or disability impacting the efficacy of language. Early intervention has been an effective method for years to help children suffering from language disorders or delays, or as a preventive measure. When a child suffers from a hearing loss, a lack of language input can have a detrimental effect on language development, impacting academic and social aspects of everyday life. According to the Individuals with Disabilities Education Improvement Act of 2004, early intervention is defined as “The process of providing services, education, and support to young children who are deemed to have an established condition, those who are evaluated and deemed to have an established, those who have an existing delay, or those who are at risk of developing a delay or special need that may affect their development or impede their education.” (Yoshinaga-Itano, 2013 pg. 144). Early intervention is implemented a young age to help children who present a delay or disorder, or possibility, can have individualized care to optimize their development and functionality in everyday life. In order for early intervention to be effective, specifically for children who suffer from any form of hearing loss, early intervention is preferred to be inclusive.

Early Intervention services may include a team. In this team includes professionals that have experience with pediatrics, and other medical professionals. Some may include a speech-language pathologist, audiologist, teacher, service coordinator, occupational therapists, physical therapists, etc. (Yoshinaga-Itano, 2013). This team centers service and care on the needs of the family, and the individual needs of the child. Those providing early intervention strive to optimize development and well being for the child and family, from infancy to approaching childhood.

Implementation is most effective when implemented at a young age. A child with a hearing loss should be screened at 1 month, diagnosed by 3 months, and be enrolled in early intervention at 6 months of age. Documentation, for example audiologic evaluations are needed to determine level of care. Follow up is also prominent to ensure successful long-term goals for the child receiving care.

Literature Review

In one research study (Jackson & Schatschneider, 2014), the goal was to explore the rate of language growth and acquisition in children who suffer from hearing loss. The study implemented early intervention auditory-verbal therapy to see its effect on language growth. In past research studies, language development in children who suffer from any degree of loss has been looked at as a whole on a broad scale. However, this study wanted to examine children individually because they grow at different rates. By making this therapy highly individualized it is easier to monitor the children's progress and get more of a sense of how their hearing loss may be affecting their rate of acquisition. This study found with the help of AVT, there was a significant change in language, with repeated exposure to this intervention program. The children who were discouraged from relying on visual processing, began to rely more on their ability to listen the best they could, and call on their spoken language to communicate. Although this article utilized a small sample size, making it difficult to emphasize that this program will work amongst a larger population, it still provided insight as to how the implementation of these programs could be beneficial to atypical developing children. All factors like degree of hearing loss, the age of identification and the reliance on a sensory device can all alter a child's ability to grow in areas of language acquisition. However, this study provides finding that will most likely

ensure a higher rate of language acquisition in children with a hearing loss when they become exposed to this AVT early intervention therapy.

In another study (Kruse, Spencer, Olszewski, & Goldstein, 2015), researchers analyzed the efficiency of the use of a multi-step intervention program. This study specifically looked at how the intervention directly affected the growth of literacy skills in low-income preschools. Researchers wanted to ensure when conducting this study that they focused on children who were falling behind, and needed more help beyond what the curriculum provided them with. Although the children who were participants in this research were also children who suffered from reading deficits, the researchers wanted to start from the source of the problem. Typically when a child is suffering from reading deficits, they suffer from deficits in pre-reading skills such as phonological awareness. This study found that lacking in phonological awareness development leads to long-term deficits in literacy skills. This information provided confirmed the notion that with repeated exposure to treatment, the higher the chance a child's language development skills would increase at a more rapid, typical rate. A big conclusion this study made was the idea of how visual cueing could be extremely beneficial making it easier for the children to understand what they are being taught. Not only did these children enjoy this study, but they also learned more during these sessions than they had in any other intervention programs they had been exposed to. The RITI program identifies these children early on and prevents them from falling behind the group when caught early. Previous studies conducted drew on children of all different developmental areas, however this study developed more concrete conclusions because the children selected all fell within the Tier 2 range.

Another study tested the effects of caregiver-implemented communication intervention on toddlers at risk of persistent language delays. This sample included 97 toddlers between the

ages of 24 and 42 months with language scores below normative mean. Caregivers were taught how to implement the 28 sessions. The results of previous studies found that receptive language improved, but expressive did not. Although, due to the range of intensity, frequency, duration and type of therapy provided can limit the interpretation of results (Roberts and Kaiser, 2016). This study was to test if caregiver implemented therapy would improve language outcomes for toddlers at risk for continuous language delays. The caregivers received instruction by trained interventionists using the method called “teach-model-coach-review” and six language facilitation strategies during intervention sessions and throughout the day with their child in sequential order (Roberts and Kaiser, 2016). Specific language targets were chosen for each child based on their performance, how many total words were in their personal lexicon during baseline, and how they were combining these words regularly. As a result, 98% of caregivers reported that the strategies helped their child with overall language skills after being used for about 17 hours a week (Roberts and Kaiser, 2016). Reported strategies that the caregivers found the most useful were in order; responsiveness, matched turns, prompting, and time delays (Roberts and Kaiser, 2016). High fidelity in caregiver use of these intervention strategies resulted in small benefits to small receptive skills, but not primary expressive language outcome. These small improvements shown in the results could be because of the short three-month intervention. Some strengths of this study include the naturalistic style in comparison to other strategies administered by speech-language pathologists. Also, the simplicity of the intervention was individualized, yet standardized, and comfortable for both the toddlers and caregivers (Roberts and Kaiser, 2016). Some limitations include the short duration of the study. It is unknown what long term results would be, possibly improvement in both expressive and receptive language. Also, only mainstream US cultures were participants, so this study could differ across other

cultures and differences in child rearing (Roberts and Kaiser, 2016). In summation, even with the short duration of this study, the results were promising with positive receptive language and some expressive lexicon outcome (Roberts and Kaiser, 2016). Although, future research that performs the study over a longer period of time can conclude more definitive results.

In another article, Diane Paul and Froma P. Roth propose a strong argument on the importance of early intervention in children who are at risk for, or have been diagnosed with a communication disorder. Their methods consist of four main principles for the success of early intervention provided by ASHA. These include family centered services, developmentally supportive and promote participation, comprehensive, coordinated and team based, and based on high quality evidence (Paul & Roth, 2011). With a family centered approach, a child's development is supported and promotes positive communication interactions with family members and caregivers. Families play a central role in early intervention services. In this approach, not only is the child receiving service, but also so is the family. This also individualizes the services based on the child's best interest. Families play an active role in decision making, which can include screening, evaluation, assessment, goal setting, intervention, and transition planning (Paul & Roth, 2011). This method is not always available, because families vary in their level of involvement. Some families may prefer a more indirect role and would rather the speech-language therapists and specialists to provide more of the direct services (Paul and Roth, 2011). Family's preference may also change over time. Culture also plays a role in family preference. Better outcomes for the child will result when SLP's use methods consistent with the culture of the family in order to socialize appropriately with their environment. For positive results, EI should be geared to the family and to the child's cognitive level, learning style, strengths and interests (Paul and Roth, 2011). In other cultures, independent

learning may be emphasized, or more towards collaboration. Expectations for child behavior at different developmental levels play a role. For example, milestones may vary across cultures. The second principle promotes services that are developmentally supportive and promote children's participation in their natural environments. A naturalistic learning environment may include settings, which a young child would learn and grow, for example with their daily communication partners, and regular social routines or activities (Paul & Roth, 2011). For example, Lisa age 2; 4, attended a publicly supported community-based preschool programs but her grandparents were concerned she was not speaking yet. At school they found that she had a hearing loss, but a clinical question that arose was where services should be provided to help Lisa's receptive and expressive language. The clinical strategy consisted of services being held at the grandparents weekly with a speech-language pathologist, but still having Lisa attend her preschool program. This was family centered and culturally appropriate for the family and for the best clinical outcome for Lisa (Paul & Roth, 2011). This example also supports the 3rd principle that services should be comprehensive, coordinated, and team based. Collaborating with the preschool teachers, audiologists, grandparents and other service providers gives EI the best success. Collaborating helps create target intervention goals and give individualized care to the patients. Principle four states that services should be based on the highest quality evidence in order to be successful in outcomes. This makes sense evidence-based systematic reviews from reputable sources for example, ASHA, is essential for clinical decision making for the safety and quality of the patient. Past evidence from clinical applications can confirm success in evaluation and service to a child receiving EI. In all, these four principles ensure the positive outcomes and highest quality care for children receiving EI.

Another article talks about how developmental screening for early intervention minimizes adverse long-term consequences. One major section of the article is milestones. If a child is not meeting milestones, this is when developmental screenings should take place to see if a child needs early intervention. For example, if a four year old does not talk in sentences or rhymes, then there is a concern with phonological processes. Several different disorders can be associated with early intervention. Some mentioned in this article include articulation, fluency, stuttering, problems of voice, language impairments, verbal communications difficulties, hearing impairments, etc. Using common milestones as a reference point are important because they represent an average. This allows some kids that do not reach them until the upper limit of the age group have a chance to meet milestones (Mulrine and Kolla, 2015). Hearing impairments are an important precursor to early intervention. This study confirmed that hearing loss could lead to social isolation and poor self-concept, difficulties in receptive and expressive language/communication skills, and lack of vocational choices and options. In order for intervention to be successful, timing of intervention is important. Treatment varies on if the child developed a hearing loss prelingually or postlingually. If early intervention is implemented early enough, language can be improved, even for children with profound hearing loss. Developmental disabilities such as autism spectrum disorder is another diagnosis that can be improved with early intervention, but the child must be diagnosed before the age of three. Overall early intervention services have shown promising results. For example, according to the national outcome measurement system, (NOMS), articulation therapy showed 69.3% improvement, spoken language comprehension improved 65.3%, and spoken language production improved 65.2% (Mulrine & Kolla, 2015).

Another article discussed how disabilities such as hearing impairments, autism, cerebral palsy and learning disabilities have always been seen as detrimental to one's lifestyle, specifically their ability to communicate. However, through this study the researchers want to help prove that with early on rehabilitation and intervention these issues in communication can be mitigated or at least improved. It was discovered that most children at the All India Institute for Speech and Hearing who suffered from one of these disabilities, their communication was impacted as well. A weakness of the studies conducted in the past was that they examined early intervention programs that were already implemented and tried to use these programs in different settings amongst different groups of kids. Although this may work for some children, the AIISH's goal was to look at the root cause of the child's communication issues and develop an intervention from there. This way the program was highly individualized and accurately targets what is inhibiting their ability to develop language. This study's findings were able to strengthen the question of whether or not early intervention programs can improve communication deficits in children. This can be concluded because according to Malar, children who received early intervention made significant gains causing them to need less educational support, and had higher rates of school competition. Not only could Malar conclude that these deficits can be improved in children with all different disabilities he specifically concluded those with hearing loss could improve. The children with a hearing loss who received early intervention help had a better development of vocabulary, better verbal reasoning and a higher level of speech intelligibility.

Prior to this study there has been findings that help link early intervention programs to improving pre school language. However, this study believes that ones previously conducted in the past had presented some flaws that they wanted to fix. Researchers have concluded that by

implementing Universal Newborn Hearing Screenings will improve overall language skills. Although the two previously conducted studies found improvements in areas of receptive language the children's speech production did not improve. In order to close the gap of the flawed areas of the previously conducted studies Ching, looked at the effect of the earlier a child received an amplification device or cochlear implant on whether or not their language improved. Not only did he find that the earlier on they had access to a device the better their communication was but they also found that it was important to continuously monitor their language production after the device has been given to them. With this they are more easily able to work on areas of phonological awareness, which helped the children vastly improve in literacy skills.

This study accurately found that children at three months who are fitted for hearing aids and children at nine months who have a cochlear implant are able to reach normal language development most of the time. Of the children studied 96 percent of children were able to reach normal communication skills. A weakness of this study was all the participants were children who had a sensorineural hearing loss. Although the researchers were able to conclude that the earlier the children were fit for hearing aids the better they developed language skills, it is important they test children who have conductive hearing loss as well. By doing this they can more accurately conclude that children with any type of loss can improve their communication deficits. Early intervention before six months of age can ensure a positive effect on child's language development in all areas of oral vocabulary, grammatical comprehension, word production and semantics.

Statistics have shown that hearing loss is identified in 2-3 infants per 1,000 live births, thus early detection and early intervention are critical to children with hearing loss. Jareen

Meinzen-Derr, Susan Wiley, and Daniel I. Choo, composed a study on the impact of early intervention on receptive and expressive language skills for children with permanent hearing loss. A longitudinal study was performed on children from newborn to 36 months with permanent hearing loss enrolled in early intervention. The services were home based, with parent involvement. Those enrolled before six months of age showed to exhibit age appropriate language and vocab skills, and maintained them over time when tested with a Language Development Scale. Those enrolled after six months of age made improvements at baseline skills, but did not have significant long-term benefits in comparison to those given intervention services before six months of age. This study also emphasizes the importance of newborn hearing screenings. This allows parents to enroll their children at early ages to further optimize language abilities and milestones because of hearing's profound effect on language development (Meinzen-Derr, Wiley, Choo, 2011). Positive results showed that children with unilateral hearing loss had increased language quotients before six months of age and those after made receptive and expressive improvements. Some weakened aspects of the study include the children with cochlear implants. Their improvements were not statistically significant. (Meinzen-Derr, Wiley, Choo, 2011). Overall major improvements were made to those enrolled before six months of age. Even after six months, improvements were made, but not as significant. This study shows that overall, early intervention is a very effective measure for language improvement for children exhibiting hearing loss.

An article in *The Journal of Deaf Studies and Deaf Education* states purposes and goals of early intervention on deaf and hard of hearing (D/HH) children. Without these individualized, high-quality, appropriate, and targeted intervention goals, the service is meaningless. Yoshinaga-Itano also states the importance of newborn screenings to determine hearing loss from a young

age. The earlier intervention is introduced; the better off the child will be in regards to language development. “Evidence states that earlier identification of children who are D/HH, accompanied by timely and appropriate interventions, can result in language, communication, cognitive, and social-emotional skills that are consistent with children’s cognitive abilities and chronological age.” (Yoshinaga-Itano, 2014, pg. 144). With the program developed in this study, support is provided for accountable EI services. Some guidelines for the best practice include children and families having access to a data management system to track progress that is efficient. This means consistently collecting and organizing data from EI services that is put into a system that is easy to use for the family. Another goal is to make sure families have access to coordinators especially trained with working with those who are D/HH. Children who are D/HH should have services provided by those who have obtained qualifications and specialized core knowledge to promote the child’s development and well being in the most efficient way possible in all different aspects such as language, hearing, ASL, etc. This goal also applies to those who have other disabilities and contributors to being D/HH, and making sure there are specialized individuals available to promote those developmental outcomes. Another goal stated is to have culturally competent learning goals with the same quality of care. According to Yoshinaga-Itano, care should be monitored every six months from birth to 36 months of age throughout schooling, and also follow up with immediate follow-up intervention services when appropriate. In order to have successful intervention, families must play an active role in the development and implementation of care from their own personal beliefs and values, and should have a strong support system through the process. The family is so important to early intervention, because they play a large role in communication, empathy, shared goals, and responsiveness. Some weaknesses that can occur that affect treatment are is if the caregivers are absent in the child’s

treatment. Also, if the family is not good with technology or does not keep up with the child's achievements/ goals, this could impact the child's potential to optimize therapy.

Methodology

Databases

The researcher retrieved all of the information from PubMed, MEDLINE, Health and Wellness resource center, CINAHL and Education Research Complete. These databases were used to find research on the effect of early intervention methods on children with hearing loss.

Participants

The participants in these studies ranged in age from birth to seven years, but most studies focused on age's birth to three years. The chosen participants came from very similar sociocultural backgrounds and there were typically a similar number of males to female participants chosen to participate. The research studies were conducted mostly in the United States, except one study that was conducted in Australia (Ching). In multiple studies, researchers chose participants who suffered from some type of hearing loss, to discover if this loss had a dramatic effect on communication, however, not all studies of the effects of early intervention displayed children with hearing loss. In these studies, these children were showing signs of language deficits and delays in comparison to other children at their age.

Materials

In all studies conducted and observed, early intervention services were utilized. All of the children received a specific type of early intervention service to attempt to mitigate any deficits they were portraying. These specific programs utilized among the studies included UNHS, universal newborn hearing screenings, EHDI, early hearing detection, SKI*HI LDS, language development scale, and AVT, auditory verbal therapy. Children in several of these

studies also had a form of amplification device. These devices included materials such as hearing aids and cochlear implants depending on severity of the child's hearing loss.

Procedure

In Meinzen-Derr, Wiley, and Choo's study, UNHS was implemented into EI services for children in the age range birth to 36 mo. with permanent hearing loss. The services were typically in the home with a parent closely monitoring, weekly or biweekly, depending on child's needs. Children were then later assessed with the SKI*HI language development scale, which focuses on receptive and expressive language skills. They were assessed at six-month intervals, unless given reason to assess sooner. Those who received cochlear implants had their differences in language development noted, because their chances of improving all over language development were greater (Meinzen-Derr, Wiley & Choo, 2011).

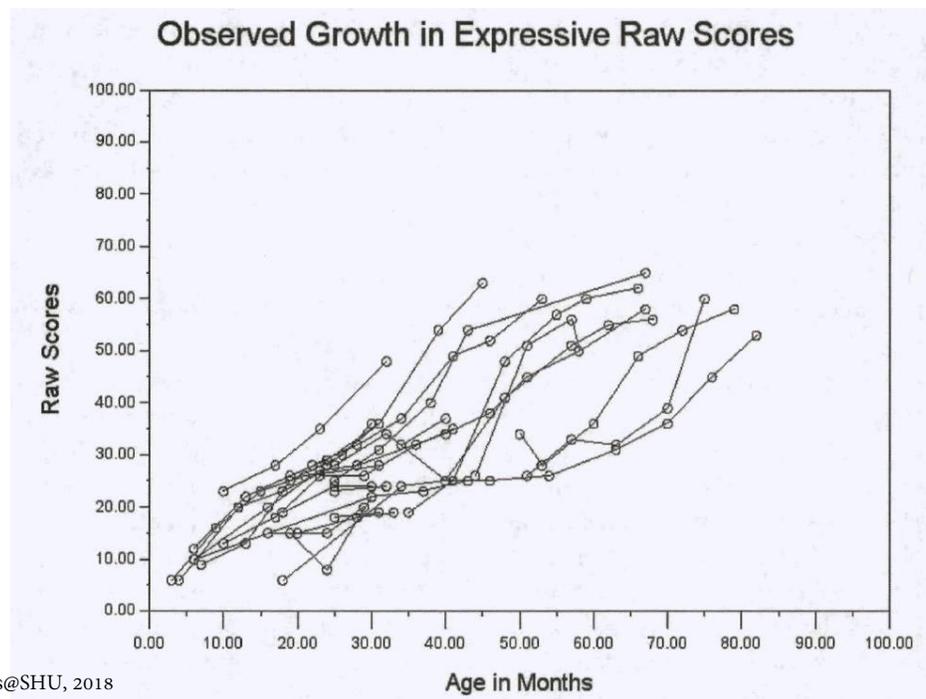
In three different studies, (Shojaei et al.,2016; Ching,2015; Jackson et al.,2015), the children all had some type of hearing loss. Some were hearing impaired and some suffered from sensorineural loss, with no other disabilities or disorders present. The children all received universal newborn hearing screenings at the time of birth where it was discovered they suffered from hearing loss. At least once a week the children met individually with staff to receive early intervention training, which included auditory-verbal training. These trainings focused upon the development of different language skills and examined how these trainings were able to improve growth of language and phonological awareness. These children were consistently monitored after each session for improvements and then annually tested each month to see if skills improved. All three groups of children were observed to see if these programs had an effect on improved phonological awareness and therefore, improved literacy skills and communication needed for formal education.

In Roberts and Kaiser, and Kruse's studies, the participants did not show signs of hearing loss, but both showed deficits in language and phonological awareness affecting their language development. The toddlers in these studies received early intervention services, and improved in overall receptive and expressive language. These studies were both individualized, and in small standardized groups. In Kruse's study, CELF, Clinical Evaluation of Language Fundamentals was used to track the toddler's progress, and in Robert and Kaiser's study, the preschool language scale was used to assess language progress.

Results

All research concluded provided evidence that the implementation of early intervention programs was highly beneficial and improved expressive and/or receptive language skills. The earlier a hearing loss in identified the greater the chance that early intervention services would have the potential to increase advancements in communication skills. Researchers found positive evidence that identifying hearing loss before sixth months of age would promote normal lingual development and proper emotional and sensory growth.

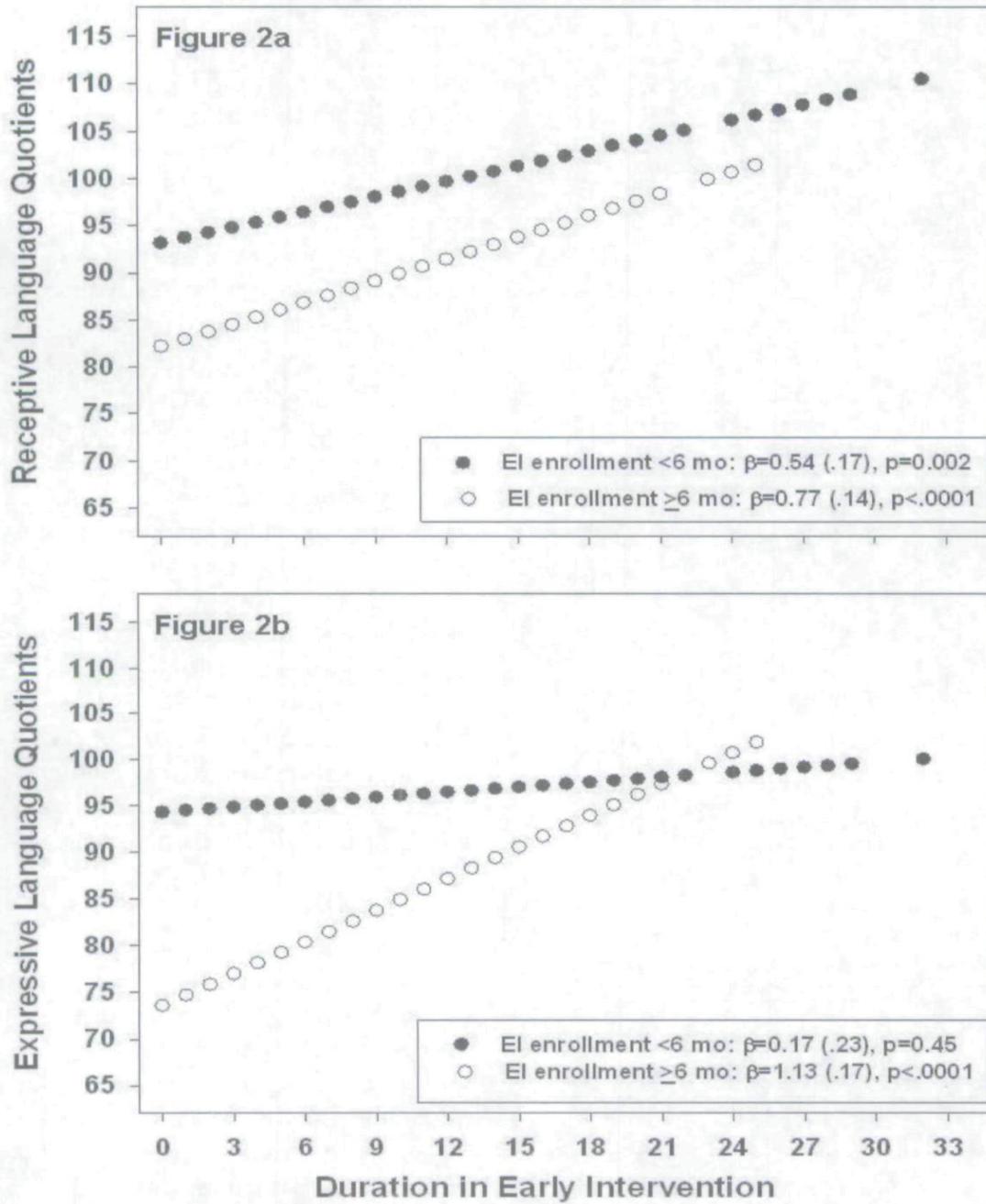
Figure 1: Jackson, C. W., & Schatschneider, C. (2014). Rate of language growth in children with hearing loss in an auditory-verbal early intervention program. American Annals Of The Deaf, 158(5), 539–554.



It

It was found that children's scores in expressive language skills who had some degree of hearing loss compared to children with normal hearing were highly similar. In figure 1, we see the observed growth of expressive skills amongst a group of participants as they continue to age. With the progression of age, we see significant improvements of lingual skills. This figure further proves that with early identification of loss and close monitoring of a child's language abilities they have the ability to catch up to normal hearing children. This figure shows children who were identified around 10 months of age and looked at improvements at sixth month intervals. With intervention programs of high quantity and quality we see better improvement of overall expressive language. Before this graph was compromised to show the upward trend of the effect of intervention on expressive language, researchers created a figure to predict the trends they hypothesized they'd see. These trends closely matched the found results, furthermore proving the effectiveness of intervention. They graphed a line of children with normal hearing to compare the ones with loss and their development.

Figure 2a and 2b: Meizen-Derr, Jareen, Susan Wiley, and Daniel I. Choo. "Impact of Early Intervention on Expressive and Receptive Language Development among Young Children with Permanent Hearing Loss." *American Annals of the Deaf* 155, no. 5 (Winter 2011): 580–91. <https://doi.org/10.1353/aad.2011.0010>.



As seen in figure 2a, children who presented with mild to moderate hearing loss both EI groups on enrollment before six months of age and after six months of age had significant positive results in receptive language quotients over the course of 33 months. Furthermore, those who enrolled before six months of age presented with age appropriate expressive language skills and maintained them over time. Although, as seen in figure 2b, those enrolled after six months of age had positive increases in language quotients over time, exemplifying a possible “catch up period” for overall language skills. These graphs exemplify the benefits and positive outcomes from early intervention enrollment in children with mild to moderate hearing loss.

Discussion

The findings of these studies signify evidence of positive outcomes of early intervention services enrollment for children diagnosed with hearing loss. All children that were enrolled in early intervention showed growth in language abilities, although, age of enrollment is an important factor in how well the child will benefit. The findings in these studies were consistent across hearing loss levels.

Since age of enrollment has shown to have a significant impact on early intervention results, the earlier a child enrolls in early intervention the greater the potential the child has to reach typical language development milestones. The earlier a hearing loss is detected, the earlier a child can be enrolled into services. Typical Early Hearing Detection and Intervention (EHDI) emphasizes the one, three, six model, which recommends screening by one month, diagnosing by three months, and intervention by six months. Researchers have found significant evidence about the importance of the implementation of newborn hearing screenings at the time of birth. The goals of universal newborn hearing screenings are to optimize language, social and literacy development for children who are deaf and hard of hearing (Yoshinaga-Itano, 2014). This is to

prevent communication delays that are typically found in later identified children. Through both early hearing detection and intervention, it is considered to be an essential component to age appropriate language development for children with hearing loss. If a child enters an EI program late, their language improvements may not be as significant, due to the limit duration of time spent in EI services, compared to a child that had hearing loss detected early and was enrolled earlier (Yoshinaga-Itano, 2014).

The findings concluded by Shojaei (2011), presents further evidence about the proficiency of the use of perceptive and expressive language evaluation with children with severe hearing loss. There is significant research supporting that syntax skills are the basis of academic gains in a school setting. Therefore, the assessment of lingual development and scheduling planned intervention programs before a child enters a school will lead to more success in communication abilities. Besides providing significant gains in a school setting, the earlier an intervention is implemented the higher the likelihood for being a successful member of the community later in life (Malar et. al, 2013).

All of the information concluded by the researchers is relevant in emphasizing the importance of early intervention. These findings emphasize the benefits of repeated intervention services over a period of time. The more intervention services a child receives, the better a child with hearing loss will be able to develop successful communication skills. The data indicates how important it is for a child to have support to decrease the potential of falling behind typical language milestones.

Limitations

In each study, the findings remained relatively constant. However, in some of the research conducted there were limitations found. For example, when choosing the participants

some of the selected sample sizes were relatively small making it difficult to fully conclude the positive effects of intervention services amongst a large population. It was difficult to compare some of the participants testing results because other factors, such as degree or hearing loss and gender were not always considered. In addition to this one of the studies didn't consider degree of a child's education making it difficult to understand how significant education contributed to a specific individual's language gains.

Conclusion

Throughout this research study, it was found that the research question was supported. Early intervention is overall a very effective method for preventing language deficits in children with varying degrees of hearing loss. Hearing loss can have an immense impact on the ability for a child to meet important language milestones. Data has shown that if a child is enrolled in early intervention at an optimal age, preferably at 6 months or earlier, their positive results of expressive and receptive language skills remain consistent overtime. Data also shows that if a child is enrolled after 6 months of age, their expressive language and receptive language skills also improves. Although its consistency is not as strong as those enrolled at an earlier age. Early intervention emphasizes the importance of the earlier the better. Despite the degree of hearing loss, intervention methods that are implemented are highly individualistic to improve communication functionality and will ultimately allow children to function at a high level in everyday activities.

Furthermore, the earlier a child is enrolled in some type of intervention program, the more likely it is for them to meet important language milestones for each age. Improvements in communication and lingual abilities in those who have hearing loss have been found to allow children to have a high functioning life. The earlier the identification of hearing loss, and the

earlier a child begins to use an amplification device along with intervention programs the better overall communication skills. These improved communication skills will improve the child's everyday communication encounters and ability to perform academically in school. Hearing loss can be detrimental to a child's overall development but there are different ways to ensure that they remain closely on target to other children. These early intervention programs goals are to optimize the child's skills and work on their areas of weakness. It is inevitable that variability in results of the effectiveness of intervention programs can vary dramatically, but in order to improve a child's skills it is important to alter programs directly to each individual. Those with hearing loss can improve lingual abilities with the continuous support of others, and overall improving quality of life and ability to communicate in an efficient manner.

References

- Ching, T. Y. C. (2015). Is Early Intervention Effective in Improving Spoken Language Outcomes of Children With Congenital Hearing Loss? *American Journal Of Audiology*, 24(3), 345–348.
- Jackson, C. W., & Schatschneider, C. (2014). Rate of language growth in children with hearing loss in an auditory-verbal early intervention program. *American Annals Of The Deaf*, 158(5), 539–554
- Kruse, L. G., Spencer, T. D., Olszewski, A., & Goldstein, H. (2015). Small groups, big gains: efficacy of a tier 2 phonological awareness intervention with preschoolers with early literacy deficits. *American Journal Of Speech-Language Pathology*, 24(2), 189–205. https://doi.org/10.1044/2015_AJSLP-14-0035
- Malar, G., N., S., & Suresh, C. B. (2013). Trends and Impact of Early Intervention for Communication Disorders at Aiish. *Journal of the All India Institute of Speech & Hearing*, 32, 173–183.
- Meinzen-Derr, J., Wiley, S., & Choo, D. I. (2011). IMPACT OF EARLY INTERVENTION ON EXPRESSIVE AND RECEPTIVE LANGUAGE DEVELOPMENT AMONG YOUNG CHILDREN WITH PERMANENT HEARING LOSS. *American Annals of the Deaf*, 155(5), 580-91. Retrieved from <https://sacredheart.idm.oclc.org/login?url=https://search.proquest.com/docview/860771492?accountid=28645>
- Mulrine, C., & Kollia, B. (2015). Speech, language, hearing delays: Time for early intervention? *Journal Of Family Practice*, 64(3), E1-E9.
- Paul, D., & Roth, F. P. (2011). Guiding Principles and Clinical Applications for Speech-Language Pathology Practice in Early Intervention. *Language, Speech & Hearing Services In Schools*, 42(3), 320-330. doi:10.1044/0161-1461(2010/09-0079)
- Roberts, M. Y., & Kaiser, A. P. (2016). Early Intervention for Toddlers with Language Delays: A Randomized Controlled Trial. *Official Journal of the American Academy of Pediatrics*, 135. doi:10.18411/d-2016-154
- Shojaei, E., Jafari, Z., & Gholami, M. (2016). Effect of Early Intervention on Language Development in Hearing-Impaired Children. *Iranian Journal of Otorhinolaryngology*, 28(84), 13–21.
- Yoshinaga-Itano, C. (2014). Principles and Guidelines for Early Intervention After Confirmation That a Child Is Deaf or Hard of Hearing. *Journal Of Deaf Studies & Deaf Education*, 19(2), 143-175.

