# THE IMPACT OF SIGN LANGUAGE ON HEARING BABIES' COMMUNICATION

by

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**Abstract**

This undergraduate thesis examined the use of baby sign and how it affects a hearing baby's language and communication skills. Previous research indicates that there is not enough evidence to draw conclusions about the impact of baby sign on communication skills, but the use of baby sign has proven to be a potentially beneficial language tool. Baby sign does not delay speech development or negatively impact communication, and many families find that it improves children's language skills. The conducted study was distributed to parents and teachers at Appalachian State University's Child Development Center and to graduate students in speech pathology. This study revealed that many families believe using baby sign positively affects the communication skills and overall development of the infants who are taught to sign. Results will be discussed in the context of teaching parents to sign with hearing babies to communicate more effectively.

**Literature Review**

Communication is an essential part of human interaction. It is the process of sending and receiving information, ideas, feelings, and messages through speech, written language, sign language, gestures, and facial expressions (Hulit, Howard, & Fahey, 2011). All children, especially those too young to communicate verbally, need a way to share their desires, dislikes, and demands to others around them.

One method of communication that is growing in popularity due to current research is using sign language, a manual form of communication involving hand shapes, movements, and facial expressions (Schow & Nerbonne, 2013). While many deaf children, those with an extensive loss of hearing, are taught sign language, studies show it may also benefit hearing children, those with hearing in the normal range of up to 15 decibels HL (Taylor-DiLeva, 2011; Schow & Nerbonne, 2013). Many studies are currently conducting research to determine if using sign language with hearing children will enhance or hinder their communication abilities. Some parents worry their children may not speak as early as expected if they learn to sign, while some believe signing is a great way to reduce frustration for children and allow them to have more meaningful interactions with those around them (Taylor-DiLeva, 2011).

Babies' gestures and motor skills develop sooner than their speech, so they can use their hands to talk before they can use their mouths (Brady, 2000). They naturally learn signs like waving goodbye and hello, so it is logical that learning other simple signs would help them to communicate. It has also been shown that toddlers can use signs to communicate an entire year before they can effectively use speech (Taylor-DiLeva, 2011).

In the first year, babies begin communicating through crying, cooing, babbling, laughing, imitating speech sounds, and eventually saying their first words (American Speech-Language-Hearing Association [ASHA], 2015). In that same year, they develop the ability to use gestures and begin combining them with sounds to convey what they want to say. Raising their arms often means they want to be picked up, and they can do this before they have the ability to say, "up." Caregivers can often learn what a baby wants by watching his or her eye gaze, hand gestures, and body language. Babies may reach for an object they want, yawn when sleepy, make a drinking motion when they want juice, and so forth. These everyday gestures help others to recognize babies' communication attempts and determine what they are trying to say (Hulit et al., 2011).

By the time a child begins using words, he or she has been communicating through gestures and sounds for months (Owens, 2012). Research indicates that before the age of two, babies can understand more language than they can verbally express (ASHA, 2015). While most children do not say their first words until around twelve months old, that does not mean they do not have the capacity to communicate (Owens, 2012). A child may communicate through body language, gesturing, and sounds to get their meaning across, and signing may give them one more technique to use to convey something to those around them.

"Motherese", also known as infant-directed speech or baby talk, is the high-pitched, short, repetitive, exaggerated style of speech that hearing parents use to talk to their babies (Owens, 2012). "Baby sign" is the term for the use of sign language with hearing babies (Hulit et al., 2011). Baby sign involves teaching sign language to hearing infants and toddlers born to hearing parents. This is a trend gaining national attention as many advertisements and websites describe the developmental benefits of signing to these children (Barnes, 2010). The

signs may be gestures invented by each individual family that are easy for the child to use, or they may be adapted from American Sign Language (ASL). ASL is the primary language of Deaf individuals in America. In some cases, the ASL signs are simplified and do not involve all of the facial expressions or syntax usually used in the language (Taylor-DiLeva, 2011).

Barnes (2010) states, "The proponent of infant sign language believes that because sign language and gestures, like spoken language, represent thoughts in a symbolic way, it may be easier for very young children to first learn language using signs" (p. 23). This does not mean that children will not reach normal speech milestones on time, but, in fact, it may mean the children develop a clearer concept of language (Taylor-DiLeva, 2011). When they begin to speak, they may do so with more confidence in their ability to be understood and a better grasp on the importance of communication (Taylor-DiLeva, 2011).

While teaching sign language to hearing babies is increasing in popularity, it is not a new trend. One study, done by Gallaudet, the co-founder of the American School for the Deaf, was discovered as early as 1910 (Barnes, 2010). Baby sign became much more popular in the early 2000s with the publication of *Baby Signs*, a book meant to teach baby signs to children as young as six months old (Acredolo & Goodwyn, 2009). *Baby Signs* began by using a set of invented gestures to communicate with babies, while other programs such as the *Sign with Your Baby* program provide materials from American Sign Language and British Sign Language (Pizer, Walters, & Meier, 2007). The current third edition of *Baby Signs* includes multiple signing options for parents, including over 150 ASL signs and modified baby-friendly alternatives (Acredolo & Goodwyn, 2009).

There is a notable distinction between using invented signs and signs from an official language, but both can be used to teach babies to sign (Pizer et al., 2007). Many other books

have been printed proclaiming the benefits of baby sign, and the popularity has risen in recent years. The increasing popularity of baby sign is also related to the increasing popularity of ASL. American Sign Language is becoming more prominent as a second language in high schools and colleges, and signing and deafness are losing the negative stigma they once held (Pizer et al., 2007). This is increasing the widely held positive view of signing.

If a parent chooses to use American Sign Language, he or she should realize that the signs are standardized and are accepted as part of an official language. Therefore, it is helpful to look up the correct signs before teaching them to others. One interesting outcome of teaching babies ASL is if the children continue to sign and improve their skills beyond the age they begin to talk, they will have the unique ability to talk with other individuals who use American Sign Language. There are not many hearing people who are able to communicate with those who are deaf or hard of hearing in their native language. Being able to do so is a way to practice signing, make new friends, and learn more about another culture.

There are also benefits to using invented signs that each family does differently, modified ASL signs, or any other non-ASL baby signs. While ASL is helpful because the signs are standardized, these flexible signs may be helpful for the exact opposite reason—they are not official signs. Families can make up signs on the go, use natural signs the baby may already make, such as sniffing for the word "flower," or use only signs that the child has the motor skills to form (Acredolo & Goodwyn, 2009).

A child's parents or caregivers choose to teach baby sign to the child to improve communication and verbal language and to strengthen the bond between adult and child (Taylor-DiLeva, 2011). The first signs taught to the baby are ones he or she may use often at

home and may vary for each child. Examples of signs taught first are "more," "eat," "milk," and "all done." Others may be "cat," "juice," or any other common words the baby could use. It is important for parents to try not to overwhelm the child with signs, but to introduce signs that are used frequently in daily life, and add more as needed (Brady, 2000). When adults use these signs with the child, they also say the words so the child learns to pair the signs with the words to better understand meaning (Taylor-DiLeva, 2011). The adults may then do the action indicated by the sign and will use these signs to communicate with the child throughout the day. Although some parents worry that signing will discourage talking, many parents learning baby sign talk even more to positively reinforce the child's signing and communication attempts.

Studies also claim that the benefits for children who learn baby sign are numerous. According to the book *Once upon a Sign*, signing babies can communicate earlier than those who wait for speech to develop, parents have reduced frustration when trying to communicate, parents can tell their child things from outside hearing distance, and children develop language sooner than they would have without signing (Taylor-DiLeva, 2011).

While some parents of hearing children are deaf and may already be fluent in sign language, others have to learn the signs necessary to teach their hearing children. *Baby Signs* and other publications about signing for hearing children encourage parents to purchase their videos, books, flashcards, CDs, and puppets to make and practice signs (Barnes, 2010). The authors of *Baby Signs*, Drs. Acredolo and Goodwyn, formed the Baby Signs Institute after creating their book to offer parent workshops and six week sessions of classes to learn baby signs, and to sell developmentally appropriate toys, books, CDs, and videos to engage young children in signing (Acredolo & Goodwyn, 2009). Other parents may choose to use invented

signs they created just for their family's use, to borrow some signs from ASL and modify them, or to do a combination of both.

For parents who have never signed before, the task of teaching their children can be daunting. Every child is different, but the time to begin signing usually occurs when the child is between six and twelve months old and is expressing a desire to communicate by pointing, gesturing, or crying to try to convey a message (Acredolo & Goodwyn, 2009). At this time, the family may choose to sign with the child, and may utilize the following tips.

First, parents should always say and sign the word they would like the child to learn (Taylor-DiLeva, 2011). If parents only sign the word occasionally when they say it, babies may become confused. Pairing the two together eliminates confusion and encourages understanding through signing and speaking. When a baby signs a word, the parent is also positively reinforcing that action by speaking the word, and he or she is teaching the child to pair the sign and word together (Acredolo & Goodwyn, 2009). For instance, if a child signs "dog," the parent may say, "Yes, that's a dog, isn't it? What a cute little dog."

Another helpful tip is to maintain eye contact with the child. The baby must realize the sign is a part of communication between the child and the adult. It may be necessary at times to help the baby form the handshapes, but if the parent helps each time, the baby will not learn to sign independently. Using facial and body expressions are also important to convey meaning (Taylor-DiLeva, 2011). When signing "sad," one must look sad, and when signing "happy," one must look happy.

Incorporating sign language into a child's everyday activities, such as story time, bath, or meals, makes use of words they need in their natural environments. Keeping it simple is also necessary when teaching very young children. Signing only key words and

adding more as the child learns is the best way to begin. Signs can be incorporated into books, rhymes, games, and songs to encourage learning and to turn learning into something fun to be shared between a caregiver and a child (Acredolo & Goodwyn, 2009). It is also necessary for parents to know that although it is never too early to begin signing to a baby, they usually do not begin signing back until around eight to twelve months (Taylor-DiLeva, 2011). However, they may still be learning about language and the world around them.

Babies use natural gestures such as reaching, pointing, and smiling to indicate their feelings. Adding signs can give them more things to say, especially at the stage before they can speak. At six months old, a child tries to reciprocate in communications with adults by making sounds in response to adults' speech to them (Barnes, 2010). After six months, the child begins to attach meaning to the words he or she hears, and by eight months, the child may understand up to twenty words (Owens, 2012). A one year-old can recognize and understand even more words and will try to make sounds that imitate speech, and a toddler can say several words, but both may be more coherent through signing as their words and speech continue to develop (Barnes, 2010).

To determine the usefulness of baby sign, researchers have conducted studies that show the benefits to children who learn signing from a young age. The studies claim that the children will have the ability to communicate better with caregivers to express wants and needs, have reduced frustrations in these adult-child interactions, and will talk earlier than non-signing peers (Barnes, 2010). Many companies advertising for baby sign also state that using sign language with the child increases the parent-child bond (Taylor-DiLeva, 2011).

Barnes (2010) claims that signing, with its need for eye contact, teaches children that communication is rewarding and reciprocal. It also allows children the ability to make known

their preferences on activities or conversation topics (Barnes, 2010). Children who sign and are understood tend to become more confident in their communicative abilities and may try to communicate more often because of this self-confidence (Taylor-DiLeva, 2011).

According to *Once upon a Sign,* signing can enhance a child's verbal language and give children a way to express themselves that is more precise than gestures and sounds (Taylor-DiLeva, 2011). Since many signs are iconic, meaning they look like what they represent, it may be easier to learn the meaning of new words and expand vocabulary if one can hear the word and see the iconic sign (Taylor-DiLeva, 2011). Preschools often use vocabulary skills as an indicator of early literacy skills, which can be another plus for the child who was taught to sign (Taylor-DiLeva, 2011).

While many adults do not see the connection between signing and increased language skills, Taylor-DiLeva (2011) explains signing as a stepping-stone. Just as children learn to crawl before they can walk, learning to sign before learning to talk can be just as useful. Crawling teaches children to use some of the same muscles and balance skills they will need to walk, and it is used at a time before the walking skills have developed. Once children can walk, they rarely crawl because walking is much faster and a simpler way to get where they need to go. With baby sign, children learn to sign because they do not yet have the ability to talk, but once they do, they stop signing and talk even more. Talking is usually a more efficient and easier way to get one's point across than signing, so babies use speech as soon as it develops (Taylor-DiLeva, 2011). Visualizing signing as a stepping-stone rather than as an alternative to speech helps parents understand its benefits and its role in the communication process (Taylor-DiLeva, 2011).

Children who sign can be taught to understand language earlier and to use socially appropriate behaviors (Pizer et al., 2007). Signing gives parents a way to communicate with children across the room to discipline them or to tell them something they need to know. It also allows parents the option to teach the child socially appropriate behaviors. Instead of banging the table when the child is done, he or she can sign "all done." In this example, signing can give the parents a more precise way of understanding what the child is trying to say, and it gives the child a more appropriate way to say he or she is finished.

Pizer et al. (2007) describes a case study conducted with three hearing children ages fifteen to seventeen months. The three families introduced signing into communication when the children were between eight and thirteen months old and continued signing through the children's second year of life, after which the children replaced signing with more fluent speech (Pizer et al., 2007). During the study, the children were videotaped at home and the signs they used were recorded and placed into four main categories—requests, politeness formulas, labels, and displays of knowledge (Pizer et al., 2007). The parents stated that their experiences with signing were positive, and that it led to a better connection with their children (Pizer et al., 2007). Though most of the signs did cease after speech improved, the children continued to use a few signs (Pizer et al., 2007).

Barnes (2010) states that even early childcare centers can greatly benefit from teaching a baby sign program to the children. Their various approaches, from only ASL signs, to invented or modified signs that are easy for babies to imitate, help the babies to communicate and reduce frustrations (Acredolo & Goodwyn, 2009). Signing can make these centers more peaceful and quieter overall, and teachers can use signing to help engage the children through songs and activities that use their hands (Barnes, 2010).

Although teaching signs to babies is a growing trend, not everyone agrees on its benefits. Despite the endorsement of the American Academy of Pediatrics, which recognized that baby sign improves communication, and the general support of the public, there is little scientific evidence to support these conclusions (Fitzpatrick, Thibert, Grandpierre, & Cyne, 2014). Studies conducted to prove the advantages of baby sign often have limitations. Some use very small sample sizes, such as using only one infant, which is not a reliable measure. Others do not use a control group of typically developing children who do not sign to compare results, or they report and record results in different ways (Johnston, Durieux-Smith, & Bloom, 2005). The findings are often in various formats, making it difficult to compare results statistically (Fitzpatrick et al., 2014).

In many research studies, parents are taught baby signing by researchers who understand language development and sign language, which is different than the self-instruction methods taught by many baby sign programs (Johnston et al., 2005). Results from one are difficult to compare to the other for scientific results. *Baby Signs* has workshops and classes, but most participants in the program follow the book, and learn and teach the signs themselves (Acredolo & Goodwyn, 2009). There is no guarantee that the children used in the research studies were taught using the same material many typical parents use to learn baby signs, which means the results from the studies may not be guaranteed to the parents who learn it themselves (Johnston et al., 2005).

Another possibility is that the child or children used in the studies are gifted, or that they may do better on language tests due to the increased parent interaction with the children while teaching them sign language (Barnes, 2010). It has been proven that mothers of babies who use gestures to communicate respond to them more frequently and use more verbal

responses, which increases the number of communicative attempts between the mother and child (Fitzpatrick et al., 2014). Increased interactions give the child more opportunities to learn language and may influence their scores on language tests. The parents of these children may also have higher education levels, which influences language development (Johnston et al., 2005).

While companies claim children who are taught to sign will show a higher IQ than their non-signing peers, this may be due to the fact that language is easier to understand if taught orally, visually, and kinesthetically, like through sign language (Barnes, 2010). It is logical that learning language concepts with more than one of the five senses makes it easier to comprehend. There is also little conclusive evidence that children who sign do have higher intelligence scores because the studies that demonstrate positive results all test different things and the results are difficult to compare (Fitzpatrick et al., 2014). Though some studies do state that signing babies have higher language scores than non-signers, there are no statistically significant differences between the two groups by the age of twenty-four months (Seal & Depaolis, 2014).

Some reports that signing babies have better language skills than non-signers have participants who are hearing, but have deaf parents who may already be using spoken English and fluent sign language to communicate (Barnes, 2010). The deaf parents will sign more often and more fluently than hearing parents do, which means the hearing parents are at a disadvantage and their children may be less successful at learning to sign (Johnston et al., 2005). Improved language results from studies of signing babies of deaf parents are not comparable to that of babies with hearing parents.

Perhaps parents who sign with their babies are also more motivated and more likely to spend more time interacting with and teaching the child (Barnes, 2010). The child may communicate better because the parent was dedicated to their learning, instead of because the child learned to sign. Infants who communicate using gestures receive more responses from mothers, and these positive responses in turn cue the child to communicate more frequently with both gestures and speech sounds (Fitzpatrick et al., 2014). The increased parent responsiveness and the use of signs by the baby lead to more opportunities for joint attention, which have been shown to have positive language outcomes (Fitzpatrick et al., 2014). It may be a combination of both sign language and parent interactions that helped the child to learn and grow at a faster rate.

As baby sign is a growing trend, it is possible the families who use it are encouraging its use. The trendiness of baby sign could be due to the popularity of the group of people who use it instead of the results (Pizer et al., 2007). The populations who use baby sign the most are often those with a large Internet presence through social media, which could make their behavior socially influential to others (Pizer et al., 2007).

Not all social groups have the type of parent/child interactions mentioned in *Baby Signs*, in which parents sit and read to their children, asking them "What's this?" and label it to teach the child (Pizer et al., 2007). The families who tend to use baby sign are also those who are more likely to provide the child with a language-rich environment and have more communication interactions (Seal & Depaolis, 2014). These are usually professional-class families who believe in the importance of adapting the environment to fit the child, as opposed to some lower class families who adapt the child to fit the environment (Pizer et al., 2007).

Another reason baby sign may not be helpful for every family is because it can set parents up to feel like failures if their children do not learn to sign (Pizer et al., 2007). Since a lot of the baby sign publicity states the overwhelming importance of meeting all of a child's needs in the first few years, parents can be made to feel like if they do not sign with their children, they are not doing their best and giving the child every opportunity to learn (Pizer et al., 2007). Parents who do sign with their child do so with the hope that the child will sign back, and positively reinforce their efforts, but some babies just may not choose to sign no matter how dedicated the parents are (Fitzpatrick et al., 2014; Pizer et al., 2007). Though motor skills develop before verbal skills, signs may still be difficult for young children. Initially, they may be vague approximations of the adults' signs and may improve over time, or the child's signs may look nothing like the adult's (Acredolo & Goodwyn, 2009).

Some children do not sign back at all for a variety of reasons, including lack of interest or the inability to make the complex handshapes. This can cause unnecessary stress for parents. With this situation, parents may feel caught between two dangers, either trying too hard to teach the child to sign because they push themselves to be as good as the parents in the signing books, or missing the opportunity to teach the child to sign and communicate earlier (Pizer et al., 2007). It is each family's choice to sign, and parents must look at many factors in their lives and make the best decision for their family.

Fitzpatrick et al. completed a systematic review of ten years' worth of literature on the use of baby sign and made this closing statement: "Our review has shown that there is no convincing evidence that exposure to symbolic gesture intervention is associated with benefits in language acquisition for typically developing children" (2014, p. 503). Many researchers have reached this conclusion and agree that more research is needed in this area.

Another systematic review determined that there was no evidence that baby sign was "beneficial, harmful, or harmless" (Seal & Depaolis, 2014, p. 446).

To be able to make a conclusion about the effectiveness of baby sign, it is important to first understand why parents want to sign with their children in the first place. Whether or not the baby sign helps the child communicate more effectively, the parents who choose to try it believe that their child has something to say and deserves a way to say it (Pizer et al., 2007). Though researchers are currently working to determine exactly how baby sign impacts communication and what lasting effects it may have, parents are also working to communicate with their children, often using baby sign as a communicative tool.

While the growing trend of baby sign has many potential benefits, there is no guaranteed success. It may benefit some families, but some may choose not to use it, or they may not benefit from baby sign. Learning a second language early in life is easier than acquiring one as an adult, and teaching children to sign can only improve communication if it has any effect at all (Barnes, 2010). Even though further research is needed in many areas to be able to make solid conclusions, parents may still feel that baby sign positively impacted their child's communication skills (Fitzpatrick et al., 2014).

Baby sign by definition is a temporary language tool. It is to be used as a stepping-stone to speech, and is usually forgotten after speech becomes easier for the child (Pizer et al., 2007). The child may not even remember that he or she signed early in life, but the parents will. It is up to the parents to determine if signing is right or beneficial for their families. If the goal of baby sign is speech development and gestures are used in infancy anyway and are initially paired with speech sounds, it is unclear if baby sign will really impact speech development or have any lasting effects (Seal & Depaolis, 2014).

The main goal of teaching sign language to young children should not be to get them to talk as early as possible; it should be to create a secure, nurturing relationship with the child that will leave them feeling confident and safe (Barnes, 2010). Good communication is very important in relationships, but it does not have to be verbal. In fact, communication takes many forms that include speech, body language, signs, gestures, and facial expressions. All of these things are important for interactions with others, and it is reasonable that parents would want to encourage their children to interact with them as early as possible. Whether or not this includes signing, babies will grow and learn from parents who are dedicated to them and their futures.

While more research is needed to effectively conclude baby sign's impact on hearing babies' communication, it is clear from the current research that signing is unlikely to delay language or speech development. Each family has to decide if signing is right for their children, but it seems that those who have tried it have found that there was either a positive change in language skills or no change at all. It is up to each individual to weigh the potential benefits with any possible concerns.

The current study examined the use of sign language with hearing babies and the impact on their communication skills. The study also investigated the possible long-term effects sign language has on a child's development. The investigator hypothesizes that using sign language as an early method of communication is very popular among parents and teachers, and it will show positive impacts on children's communication and development.

## Method

The Institutional Review Board at Appalachian State University approved all study procedures. The study used a survey to determine participants' views on the use of sign language with hearing babies as a method of communication.

### *Participants*

The participants in this study were teachers and parents of children in Appalachian State University's Child Development Center and graduate students in speech pathology at Appalachian State University. The teachers and parents at the Child Development Center were chosen for their knowledge and experiences with young children, while the graduate speech pathology students were selected because they are more likely to have experience with sign language and may be more educated about its use. The students may have opportunities in the future to work with clients who sign and may have already developed an opinion of sign language. Names were not required for the study and information was not identifiable. Participation was voluntary and all participants were adults who independently decided to participate. The study had seventy participants. Fifty-three of the survey respondents were graduate students in speech pathology. Sixteen responses were from individuals associated with the Child Development Center, including five teachers, five teachers who were also students, three parents, two teachers who were also parents, and one speech pathologist. One individual did not specify an occupation.

The Child Development Center informed the researcher that all teachers were previously required to take a workshop on sign language. They all incorporate it into their classrooms and teach the students several basic signs to aid communication. The director also mentioned that using their hands to sign allows the children to do activities together, such as

singing and signing to songs, while keeping the children's hands from distracting themselves or others.

***Materials***

The survey used in this study included ten questions about sign language and its use as a method of communication for hearing babies under a year old. The purpose of the study was to determine the participants' opinions on sign language in general and the use of sign language to communicate with hearing babies. Most of the questions were closed-ended, but four of the ten questions were open-ended to allow for additional relevant information. One sample question is as follows: "Do you have any experience with sign language? Yes or no. If yes, how much experience?" The survey may be found in the appendix.

***Procedure***

Participants were recruited and data collection took place in March and April 2015. The survey was administered in Edwin Duncan Hall of Appalachian State University and in the Child Development Center. Participants were given a physical copy of the survey, and were informed of the purpose of the research. They were given the choice to participate, knowing participation was voluntary. The researcher handed out surveys to the graduate students and collected them when completed. At the Child Development Center, the researcher gave the surveys to the director, who then distributed them to any willing participants who met the criteria (i.e. teacher or parent). The surveys were returned to the director within two days and the researcher received them from there. All surveys participants were anonymous.

**Results**

Of the 90 potential participants, 70 completed the survey, resulting in a response rate of 78%. Over 62% of the graduate students and 56% of the individuals from the Child Development Center indicated they had experience with sign language. Responses ranged from knowing just a few basic signs to having taken several courses in ASL. One respondent stated his or her mother had signed to them their whole life.

When asked if babies who learn to sign before one year old will have different communication abilities than their peers who did not sign, 76% of survey respondents responded "yes" (see table 1). One survey respondent who is a speech pathology graduate student stated that, "They may be able to express their wants and needs earlier than other children." Another graduate student wrote that, "They understand the meaning of communication exchanges earlier. Frustration and tantruming is reduced."

When asked if they thought using sign language with hearing babies under a year old would impact development, 75% of survey respondents responded, "yes." However, the results are mixed as to whether the impact is positive or negative. One graduate student wrote, "I have heard that this could delay speech for a typical child because they are rewarded for using sign." Another stated, "It might make them happier because their needs are getting met more quickly, but…doing it early won't make a kid smarter—just happier for a few months." Others thought signing would positively impact development. One graduate student survey respondent wrote, "It will help with gross and fine motor development and provide tactile reinforcement of words."

Over 80% of respondents believed that baby sign has long-term effects on a child's development. Of those responses, 98% stated that the effects were positive, though these

lasting effects were not defined in any way. One graduate student respondent added that, "Associations are clearer because of their sign language use."

Table 1

Survey Questions and Responses

| Survey Questions | Yes | No |
|---|---|---|
| Does signing lead to different communication skills? | 76% | 24% |
| Does signing impact development? | 75% | 25% |
| Does signing have lasting effects? | 80% | 20% |

**Discussion**

This study revealed that most survey participants believed using baby sign affects the communication skills and overall development of the infants who are taught to sign. While current research cannot make statistically significant conclusions due to a lack of supporting evidence, the anecdotal comments in the surveys show that many people do find baby sign to be an effective communicative tool. An individual's personal experiences and successes with sign language are more important than current research in determining its effectiveness to them. Even if research does not support these conclusions, sign language may still benefit many. The survey respondents' comments demonstrated that many people had seen the positive impacts and improved communication skills babies may have if they are taught to sign at a young age.

That so many participants believed that baby sign has lasting effects on a child's development was an unanticipated conclusion. This is one of the least researched areas of baby sign's effectiveness. By the time children are in school, a variety of uncontrollable environmental factors have affected their development and it is difficult to determine exactly what role baby sign had in developing their language skills. What little research has been conducted shows that there are no statistically significant differences after the child turns two years old (Seal & Depaolis, 2014). This does not mean that children may not benefit from signing; it just means that those benefits are not statistically significant. In addition, self-confidence, a better grasp on language, and strong parental bonds, which are all potential outcomes of successful signing, are difficult to measure (Taylor-DiLeva, 2011).

### *Limitations and Future Directions*

There were a few limitations to the study that may have an impact on the results. Time constraints were in place due to the length of the study and the short amount of time to gather data, and a small sample size affected the number of responses. The researcher experienced difficulties organizing and categorizing open-ended survey responses to determine results. One final limitation was the inconsistent responses and response rate of the survey respondents.

In the future, baby sign is projected to continue to rise in popularity and more studies will be conducted on its use. Further research is needed to conclusively support the stated benefits of baby sign. Studies need to include more participants and categorize results clearly and concisely so they can be better compared and analyzed with other studies. Whether or not baby sign has lasting effects is an area in need of this research. If it is proven that it does increase IQ scores and language development as many studies claim, it could change the way children communicate and the willingness of parents and caregivers to implement sign language with babies (Taylor-DiLeva, 2011).

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## Appendix

### An Investigation of Sign Language in Children under One Year

You are invited to participate in a research study about the use of sign language with hearing babies under one year old for a Senior Honors Thesis. Participation in this study is voluntary and there are no consequences if you refuse to participate or decide to discontinue participation at any time. There are no risks or benefits to participating in the study and there will be no compensation for participants. Societal benefits of the study are better knowledge and understanding of the impact of sign language on hearing babies' communication. All responses will be anonymous.

If you choose to participate, please complete and return this survey by Friday morning, April 3, to Ms. Peggy Eller's desk. Thank you.

1. (Circle as many as apply) Are you a
   Graduate student in speech pathology
   Teacher
   Parent
   Other:

2. Do you have any experience with sign language?
   Yes No
   If yes, how much experience:
   Why did you choose to learn sign language?

3. Did you know that you can teach a child under one year old to use sign language to communicate?
   Yes No

4. How early do you think babies could be taught to sign?
   Under 6 months
   7-11 months
   12 months or older

5. Do you think babies who learn to sign before one year old will have different communication abilities than their peers who did not sign?
   Yes No

If yes, how?

6. Do you think using sign language with hearing babies under one year old will impact development?
   Yes No
   If yes, how?

7. Do you think there are any long term effects on development of those who learned to sign as babies?
   Yes, positive
   Yes, negative
   No

8. Do you have any children?
   Yes No
   If yes, did you teach them to sign? Yes No
   Do you believe it could have an effect on their communication abilities?
   Yes, positive
   Yes, negative
   No

9. Would you consider teaching any future children to sign?
   Yes No I'm Not Sure

10. If you plan to pursue a career in speech pathology, do you plan to use sign language in the future either at home or with clients?
    Yes No N/A
    Explain if necessary:

If you have any questions you may contact Katie Reynolds at baucomkg@appstate.edu or Dr. Jennifer Dalton at daltoncj1@appstate.edu. You may also contact the Appalachian State University Institutional Review Board by phone (828)-262-2692 or at irb@appstate.edu.

Appalachian State University's Institutional Review Board has determined this research to be exempt from IRB oversight.