The Impact of Baby Sign on Motor Development in Typically Developing Infants and Toddlers

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THE IMPACT OF BABY SIGN LANGUAGE ON MOTOR DEVELOPMENT IN TYPICALLY DEVELOPING INFANTS AND TODDLERS

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Impact of Baby Sign on Motor Development in Infants & Toddlers

by Melissa Garcia

Chairperson of the Supervisory Committee: Dr. Vannesa Mueller
Department of Speech-Language Pathology

“Baby Sign is an augmentative communication approach that teaches babies keyword signing that they can use to communicate before they talk.” (Sneddon 2003). Baby sign has become popular among parents of infants as a means to communicate before the child can verbally express wants and needs. Programs and classes are now becoming available in many areas of the country to help teach parents basic signs to use with their children. This study aimed to assess the impact of baby sign on motor development in typically developing infants. The study found that the impact of baby sign language on motor development was not statistically significant. Qualitative data provided support for further research in this area.

Keywords: motor development, baby sign, ASL in hearing infants
TABLE OF CONTENTS

ACKNOWLEDGEMENTS........................................................................................................iv
ABSTRACT..........................................................................................................................v
LIST OF TABLES..................................................................................................................vii
LIST OF GRAPHS................................................................................................................viii
CHAPTER I: LITERATURE REVIEW.....................................................................................1
  I.I........................................................................................................................................1
  I.II......................................................................................................................................2
  I.III....................................................................................................................................3
  I.IV....................................................................................................................................4
  I.V......................................................................................................................................5
  I.VI......................................................................................................................................6
CHAPTER II: METHODS.......................................................................................................7
  II.I.......................................................................................................................................7
  II.II.....................................................................................................................................8
  II.III...................................................................................................................................8
  II.IV...................................................................................................................................8
  II.V....................................................................................................................................9
  II.VI...................................................................................................................................12
  II.VII................................................................................................................................12
CHAPTER III: RESULTS......................................................................................................13
CHAPTER IV: DISCUSSION..................................................................................................17
BIBLIOGRAPHY..................................................................................................................19
APPENDIX A: Questionnaires............................................................................................21
APPENDIX B: ASL Sign......................................................................................................24
CURRICULUM VITA............................................................................................................27
LIST OF TABLES

<table>
<thead>
<tr>
<th>Number</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Participants &amp; Ages Pre- &amp; Post-Test</td>
<td>7-8</td>
</tr>
</tbody>
</table>
LIST OF GRAPHS

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>GDQ Scores</td>
<td>13</td>
</tr>
<tr>
<td>1.2</td>
<td>Physical Development Scores</td>
<td>14</td>
</tr>
</tbody>
</table>

viii
1.1 CURRENT RESEARCH ON BABY SIGN

Recently, research has been conducted concerning the effectiveness of baby sign and why it should be used with infants and toddlers. According to a study by Barnes, (2010, p.23) “the proponents of infant sign language believe 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. Perhaps the essentials of language acquired through the manual modality transfer to the verbal modality when children develop the ability to create phonemes.” This suggests that teaching a child sign language could be beneficial in overall language development.

Introducing the signs to parents rather than having the children learn signs from unfamiliar instructors was proven to be a more effective way for the children to learn and use signs according to an experimental study by Acredolo and Goodwyn (2000). “The greater number of signs used by children in the sign group was claimed as evidence that their parents were effective teachers.” (Acredolo & Goodwyn, 2000.) This shows that parent education is important in acquisition of sign language by infants. In order for sign language to be an effective means of early communication, parents must learn to effectively use it in their daily routines.

Barnes and Barnes (1980) discussed the effects of baby sign on the development of a typically developing infant of hearing parents. This study observed an infant whose parents implemented sign and verbal language throughout his early development. In this study, their
subject acquired his first 50 words approximately 8 months earlier than his peers. The study goes on to say that this accelerated learning may possibly have taken place due to the introduction of a signing component during the infant’s early interactions.

Yet another study discussed the reported benefits of baby sign. Acredolo et al (2000) stated that “baby signs stimulate brain development by strengthening connections that make it easier for a baby’s subsequent efforts to communicate to succeed...without the use of sign, this neurological growth would be delayed several months until the baby could articulate words.” Although correlations can be made about the use of baby sign and advances in development, there is a need for more research before a direct cause-effect relationship between baby sign and child development can be formulated.

1.2 BABY SIGN VS. GESTURING

Even though some studies have been done, limited research is available concerning the impact of baby sign on child development. The majority of the research does not discuss how baby sign impacts areas of development other than language. Most research available covers gesturing and language development as opposed to baby sign and language development. According to the National Association of the Deaf, “ASL [American Sign Language] is a language with its own unique rules of grammar and syntax.” On the other hand, according to Acredolo and Goodwyn (1988, p.450), typically developing infants use gestures to “symbolically represent objects, needs, states, and qualities. These gestures are shown to be a typical rather than rare phenomenon in child development and to function in ways similar to early verbal symbols.” The difference between the two means of communication is that baby sign is taught whereas studies suggest that gesturing is a means of communication that is developed without instruction. As its definition suggests, ASL is a
language system that has its own set of grammar rules while gesturing is a means of communication that does not have linguistic rules.

1.3 CORRELATIONS BETWEEN VOCAL AND MOTOR DEVELOPMENT IN INFANTS

An observational study done by Iverson and Fagan (2004) took a closer look at infant vocal-motor coordination. The authors discussed the idea that connections between vocal and motor development take place during infancy. For example, during face-to-face interaction, index finger extensions in infants between two and four months old co-occur with mouthing and vocalization. Cobo-Lewis et al (1996) also discussed the concept that rhythmic limb movement is correlated with the age at which reduplicated babbling emerges. These vocal-motor co-occurrences could possibly be the foundation for simultaneous speech and gestural production.

Ejiri and Masataka (2001) looked at co-occurrences of vocalization and motor activity in infants between the ages of six and eleven months in their study. These researchers found that motor activity such as mouthing, manipulating, banging, and rhythmic actions occurred simultaneously with vocalizations. This shows that both areas of development are interrelated. It could indicate that motor movement is encouraged by vocalization.

A study by Petitto and Marentette (1991) also showed that verbal vocalizations and motor movement are related. The study examined the motor movement of both hearing and deaf infants while babbling. They found that there were two types of motor movement occurring: syllabic manual babbling and gestures. Both types of movement were observed in both the infants that were hearing and the infants that were deaf, although manual babbling was seen at a significantly higher rate in the children who were deaf as opposed to the children who were hearing. The study concluded that “babbling is an expression of an amodal, brain-based language capacity capable of processing speech and sign. Despite radical differences between the motoric mechanisms that
subserve signed and spoken languages, deaf and hearing infants produce identical babbling units.” (Petitto & Marentette, 1991, p.1495) This further shows an interrelation between motor and verbal language, possibly showing that motor and verbal language output uses the same area of the brain. Although the infants used different modalities at different frequencies both produced babbling units through the motor modality, which also shows a possible correlation between verbal output and motor movement.

1.4 MOTOR DEVELOPMENT IN TYPICALLY DEVELOPING INFANTS

Motor development occurs similarly in all typically developing infants, which are the subjects of this study. According to Bayley’s Scale of Motor Development, (1969) at around one month of age, typically developing infants have the ability to adjust their posture and head position when being held in order to rest comfortably against the shoulder. They also have the ability to turn their heads in order to observe their surroundings. By two months of age, infants have the ability to raise their heads when lying on their back. At four months of age, the infant moves their head when they hear a sound. At six months of age a child can sit up independently. Between eight and twelve months of age, the infant can put all of its previously acquired gross motor skills to use by performing more complex tasks. During this period, an infant can raise itself from sitting position to standing position, locate toys or desirable objects by moving its head, and indicate wants through gesturing and pointing. Integrating baby sign into a child’s life at this developmental period may be beneficial not only to language development but to these areas of gross motor development as well. Early gross motor development may promote the development of fine motor skills, which can also be beneficial.
1.5 CURRENT RESEARCH ON BABY SIGN AND MOTOR DEVELOPMENT

Presently, there is very little research available concerning the direct impact of baby sign on motor development. Most research available on motor development or baby sign is available separately. It is an important area to research because infants learning baby sign are utilizing motor skills in the process of developing sign, therefore, it can be hypothesized that baby sign has a positive impact on motor skill development. According to a study by Bonvillian et al (1983, p.1436), “the overall maturation of the speech centers is behind that of the motoric centers at birth, and the development of speech centers proceeds at a slower pace.” Because of this gap in levels and speed of development between the motoric and speech centers, children may be able to communicate more through motor movement than through speech. If a child is trained in a means of motor communication such as baby sign, they may be able to communicate needs and wants through their motor skills that they would be otherwise unable to communicate.

Bonvillian et al (1983, p.1441) goes on to say that, “motor control of the hands matures before comparable motor control of the voice in young children. Thus, [the] observation that human infants, whether deaf or hearing, typically initiate their symbolic communication in the gestural mode rather than the vocal mode is not surprising.” Because motor development of the hands occurs more quickly than that of the mouth, it may be beneficial for an infant to have a means of communication that utilizes their hands before they can verbalize needs and wants.

Bonvillian et al. (1983, p.1438) also found that “the subjects were slightly accelerated in terms of the ages at which they passed different motor milestones, but fell within expected ranges.” However, the article goes on to say “those subjects who were among the first to pass early motor milestones were also among those who more rapidly acquired the later milestones.” (Bonvillian et
al., 1983) Even though motor development was observed and assessed during the study, the study focused on children of deaf parents rather than hearing parents like the present study.

On the other hand, a systematic review by Johnston et al. (2003) states that motor development did not occur at a faster rate in children who had utilized baby sign as a means of communication. This contrast in evidence lends to the importance of conducting follow up research concerning the effects of baby sign on motor development.

1.6 RESEARCH QUESTION

The proposed research seeks to determine whether or not there will be an impact on motor development caused by the implementation of baby sign. The research question asked is, “Will the implementation of baby sign as a motor means of communication in typically developing children result in (a) earlier development of gross motor skills and, (b) earlier acquisition of fine motor movement tasks?”
2.1 PARTICIPANTS

Eleven typically developing infants between the ages of six and thirty-six months and their parents or caregivers participated in this study (N=11). The parents of the infants voluntarily signed up for a 5-week course on baby sign that met once a week for 2 hours per session. Typically two parents or caregivers per infant attended the weekly courses and make-up sessions were scheduled for families who were unable to attend any of the classes. There were 5 male infants and 6 female infants. Each participant was assigned a number in order to maintain the privacy of all participants.

Table 1: List of participants and chronological ages pre- and post-test

<table>
<thead>
<tr>
<th>Participant</th>
<th>CA Pre-Test (months)</th>
<th>CA Post-Test (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>P2</td>
<td>7</td>
<td>11</td>
</tr>
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<td>P3</td>
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<td>P4</td>
<td>10</td>
<td>12</td>
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<tr>
<td>P5</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>P6</td>
<td>15</td>
<td>18</td>
</tr>
</tbody>
</table>
2.2 EXPERIMENTAL DESIGN

The study is a pre-test post-test study within one group of participants.

2.3 DEPENDENT MEASURES

The dependent measure of this study was the gains in motor development of the typically developing infants as indicated by the DAYC Assessment.

2.4 MATERIALS

Before the initial assessment was administered each parent or set of parents was asked to complete a short questionnaire (See Appendix A for the following 2 forms) concerning the communication habits and language environment at their homes. The parents also received another questionnaire concerning the motor development milestones of their infants. This questionnaire asked questions such as, “At what age did you child sit up on their own?” After this paperwork was completed, the infants were given an initial assessment. The researchers chose the norm-based Developmental Assessment of Young Children (DAYC) assessment (1998), which is designed for use on infants and toddlers between zero and forty-eight months of age. This assessment takes between 10 and 20 minutes per subtest to administer.
The DAYC includes subtests for: cognition, communication, social-emotional, physical (motor) development, and adaptive behavior. Overall, the assessment takes between 50 minutes and 1 hour and 10 minutes to administer. The DAYC is scored on a binary scale, with the number 1 representing correct and 0 representing incorrect. The assessment provided researchers with a raw score, age equivalent, percentile rank, standard score, and rating.

Specifically in motor development, The DAYC’s “physical development subtest consists of 87 items that measure a child’s motor development. Motor skills involve the use of the body’s large and small muscles to perform basic movements. The DAYC assesses skills from both gross and fine motor development.” (Voress & Maddox, 1998) The researchers performed the assessments in teams of 2 or 3 and each assessment took a total of between 45 minutes and an hour to administer. Each subtest divided into approximate ages at which children acquire skills and abilities. For example, in the physical subtest under 12 months, the assessment looks for things like: child can “pick up a small object using thumb and forefinger” or “child walks without holding on, may fall easily.” (Voress & Maddox, 1998)

Each subtest had a raw score, age equivalent, percentile rank, standard score, and overall rating of the child’s abilities (Very poor, poor, below average, average, above average, superior, and very superior). The assessment also provided researchers with a General Development Quotient, which is “derived by adding the 5 DAYC subtests standard scores and converting the sum to a standard score” (Voress & Maddox, 1998).

2.5 PROCEDURES

Researchers used the data drawn from the initial assessment to assess the abilities of the infants before any sort of intervention took place. After the pre-test was completed, the parents participating in the class began to learn baby signs and implement them with their children. The
DAYC was administered once again 6 weeks after the class had ended. This allowed enough time for the parents and guardians to implement the baby signs with their children, but not enough time to attribute all improvement on scores to external variables such as maturation.

Researchers teaching the baby sign class to the parents of the infants and toddlers decided to focus on one topic per week that would be functional in the children’s daily lives:

• Week 1: Greetings and Family Members
• Week 2: Food Items and Verbs
• Week 3: Toys and Games, and Animals
• Week 4: Emotions and Routines
• Week 5: Miscellaneous signs requested by parents. (see Appendix B for a list of all signs covered in the 5 weeks).

At the end of each week, each parent was supplied with a handout that included images, descriptions, and scenarios for usage of each of the signs that were covered in class. At the end of the five weeks, each parent received a DVD of one of the researchers producing all the signs covered throughout the 5-week course.

The class consisted of two separate components: an instructional period with parents alone, and then implementation of signs with the infants and toddlers. During the instructional period, parents were taught the signs by the three researchers and received reinforcement of the signs through a PowerPoint presentation. They practiced sign production and time was allotted for any questions that may have arisen. After the parents were clear on the productions of all signs and appropriate scenarios in which to use them, the infants and toddlers were introduced to the
classroom during the implementation period. Each week, researchers provided different objects that were useful for the sign training that week:

• Week 1: Families were asked to bring in photos of familiar persons so they could be reviewed with the accompanying sign with the infants

• Week 2: Researchers provided goldfish crackers, animal cookies, apple juice, and fruit

• Week 3: Toys conducive to parent/child interaction were introduced during this session

• Week 4: Parents were instructed to label clothing items as well as go through basic daily routines depicted in books

• Week 5: A recap of all ASL signs as well as the introduction of 74 novel signs parents had inquired about throughout the course

Infants and toddlers received immediate reinforcement for sign production. Parents were provided with instruction and feedback regarding how to properly implement the sign during daily routines, and when it was appropriate to use signs. Parents were instructed to interact with their children as they typically would, and feedback during natural interaction was provided. The implementation period of the class was focused on reinforcement of the sign with the parents and the infants. Instructors told the parents they should focus on using the sign whenever the occasion arose. For example, parents were instructed to use the sign for “daddy” whenever he came home, or entered the room. The researcher observed motor development as infant and toddler sign production progressed and increased throughout the 5 weeks.

Five to seven weeks post completion of the five-week course; the infants were assessed using the Developmental Assessment of Young Children (1998) once again. Use of the same testing instrument gave consistent data to provide evidence of any impact of the workshop on the
motor development in infants and toddlers. After all the data from the pre-test assessments, post-test assessments, and the parent surveys was gathered, the researchers analyzed this information.

2.6 STATISTICAL ANALYSIS

Data was analyzed using Wilcoxon Signed Rank Test to measure the gains in the post-test data when compared to the pre-test data.

2.7 INTER-RATER RELIABILITY

A percentage of the pre- and post-test assessments were recorded with video cameras and watched by other qualified graduate students in order to ensure inter-rater reliability within pre-test and post-test data. The raters were familiar with the typical development of infants and had executed various developmental assessments on infants and toddlers.
Chapter 3

RESULTS

Eighty-seven items were scored using the Physical Development Subtest of the Developmental Assessment of Young Children (1998) for each of the eleven participants prior to the workshop and five-seven weeks post workshop. Standard scores for each individual participant on both the pre- and post-tests are reported in Graph 1.2. Standard scores provided the researchers with the best indication of each child’s abilities at the time of assessment. The DAYC has a mean score of 100 and a standard deviation of 15.

The DAYC also provides evaluators with a General Development Quotient (GDQ). The GDQ combines all the scores from each of the five subtests to give an overall standard score for the child’s general development. GDQ scores for each of the participants are reported in Graph 1.1, and scores for the physical development subtest are reported in Graph 1.2.

Graph 1.1 shows Standard Scores for General Development on Pre- and Post-Test assessments for each participant.
As the graph shows, participants one, three, four, six, seven, eight, nine, ten, and eleven saw an increase in their GDQ from pre-test to post-test. However, the gains made by each participant were not statistically significant when analyzed using a Wilcoxon Sign Ranked Test ($z = -1.869$, $p = .062$). Participants two and five saw decreases in their scores, but still tested within normal limits for their ages. This decrease in scores could be attributed to the increasing stringency of criteria as children age. Although only slight gains were seen for each participant, qualitative data from parents reported in the next section provided more information about the possible correlation between baby sign language and child development.

Graph 1.2 shows Standard Scores in Motor Development on Pre- and Post-Test assessments for each participant.

This graph shows an increase in scores for participants one, five, six, seven, eight, and eleven. Like the GDQ scores, the increase in these scores was not statistically significant ($z = -$


1.228, p= .219). Unlike the increase in GDQ, the increase in motor development is slighter, which could indicate more gradual progress in this particular area of development.

**Subjective Data**

In the survey on parent interaction, three parents reported previous exposure to ASL prior to the workshop. Two of the infants had learned ASL signs during language therapy, but tested within normal limits for language at the time of assessment. The other participant had only been introduced to the ASL sign for “more.” Eleven parents reported that they worked, and only one of the infants attended daycare. The infants’ family members provided childcare for the other ten children while the parents worked. Nine parents reported themselves as the children’s primary caregiver and each reported that they spent \( \leq \) eight hours per day with their children. The other two parents reported both themselves and the infants’ grandparents as the primary caregivers and spent \( \leq \) six hours a week with their children. Eight of our participants had siblings, two of them having twin siblings, five with older siblings, and one with a younger sibling.

In an attempt to find a correlation between an increase in motor development, an association was sought between the six participants who saw an increase and the amount of time spent interacting with their parents. Of these six children, all parents worked, one child attended daycare, and the other five were looked after by grandparents while their parents worked. Parents reported spending at least six hours a day with their infant. The variability of this data, which is similar to the data in those five participants who did not see gains in their physical development scores, allows for the assumption that the gain in scores does not appear to be correlated with
parent/infant interaction. This could possibly show a correlation between the implementation of baby sign and slight gains in physical development scores.

In a survey administered prior to pre-testing about motor development milestones, each of the parents reported that their children fell within typical limits of motor development for all milestones (See appendix A for motor development survey). This was used as inclusionary criteria for the study.

Qualitative data reported by parents at the conclusion of the class supports the idea that baby sign is beneficial to motor development as well as overall development. In a survey filled out by each workshop participant, parents reported their children as being more attentive to their own hands as well as the hands and gestures of their caregivers. The infants and toddlers began moving their own fingers and hands in an effort to imitate sign productions made by parents.
Chapter 4

DISCUSSION

This study sought to discover whether the implementation of baby sign in typically developing children would result in (a) earlier development of gross motor skills and, (b) earlier acquisition of fine motor movement tasks. A Wilcoxon signed-rank test showed that a 5-week baby sign workshop did not elicit a statistically significant change in the development of gross motor skills or in the acquisitions of fine motor movement tasks ($z = -1.228$, $p = .219$) at the time of post-assessment. Although statistical analyses did not indicate any statistically significant change in participants’ motor skills between pre- and post-assessment, qualitative data reported by parents did show support of the potential benefits of using sign language with their infants.

Many factors could have attributed to the lack of statistical significance. One of these factors would be the amount of time between pre- and post-testing. A follow-up longitudinal study in which participants are assessed year later, like the study performed by Bonvillian et al. (1983) might yield different results. Because this study re-assessed the infant only five to seven weeks post-class, the results contradict those of Bonvillian et al (1983). The implementation of a control group would also supply more validity to the data collected within the group of infants whose families participated in the workshop. Another factor that could be changed in a follow-up study would be the large age range of participants. The age range could be narrowed down, and this could possibly show statistically stronger data within a smaller age group. A larger group would also allow researchers to generalize results to the population.
There are also external factors that could not be controlled for, which may have affected the statistical significance of the data. Maturation occurs at a slightly different rate in all infants. Some infants will mature at a more rapid rate than others, which could contribute to the development of gross and fine motor skills. Another factor that could contribute to the data is the amount of time the parents spent implementing the baby sign program with their children. In a future study, correlations could be made between the amount of time baby sign is being implemented and the amount of improvement shown in the assessment scores.

The increase in attentiveness to motor movement of the hands, reported by parents in a survey, may lead to earlier development of motor skills in these infants at a later time. Parents also reported a decrease in frustration. Providing children with a means of communication before language has fully developed could result in less frustration and tension.

Although this preliminary study has limitations, it provides a gateway for more research to be done in this area. A repetition of this study, modified into a longitudinal study, would provide more information about the effects of sign language on motor development. This would allow an understanding of how sign language could be implemented with at-risk and language delayed infants in order to provide them with as much support for development as possible. Inclusion of a group study, narrowing down the age range, and providing correlations between time spent signing and improvements in assessment scores could also provide new data. Qualitative data did show an increase in motor movement and awareness in infants whose parents implemented sign language with them in daily interaction. Quantitative data provided did not prove to be statistically significant, however; small gains in motor development scores were seen in most participants.
BIBLIOGRAPHY


APPENDIX A

INITIAL QUESTIONNAIRE FOR PARENT (S)/GUARDIAN(S)

Infant’s DOB: ___________                    Date: ________

1. Do parent(s) work?
   □ full time  □ part time  □ self-employed  □ not applicable

2. Who spends the most time interacting with your child?
   □ parent(s)  □ relative  □ nanny  □ other_____________________

3. Does your infant attend daycare? If so, how many hours daily?

4. Does your child have siblings? If so, how many and what ages?
MOTOR DEVELOPMENT SURVEY

Infant’s DOB: __________________ Date: ____________

1. At approximately what age was your child able to support his/her own head?

2. At approximately what age did your child sit up unsupported?

3. At approximately what age did your child begin to crawl (if applicable)?

4. At approximately what age did your child first stand on his/her own (if applicable)?

5. At approximately what age did your child begin to walk (if applicable)?

6. Does your child wave his/her arms or legs when babbling or making noise?

7. Have you practiced any sign language with your child before now?
Baby Sign Workshop Survey

As our workshop ends, please take a few minutes to reflect on the experience. Your honest and thoughtful answers will help us improve this course in the future.

1. How confident are you in your ability to use sign with your child?

   1 – very confident; 2 – somewhat confident; 3 – slightly confident; 4 – not at all confident

2. How stressful was the workshop?

   1 – very stressful; 2 – somewhat stressful; 3 – slightly stressful; 4 – not at all stressful

3. How stressful is using sign with your child?

   1 – very stressful; 2 – somewhat stressful; 3 – slightly stressful; 4 – not at all stressful

4. If you found the workshop or using sign with your child to be stressful, please comment on what made either of these experiences stressful?

5. If you did NOT find the workshop or using sign with your child to be stressful, please comment.

6. Have you seen any change in your child’s language or communication? (Example, more/less frustration, more/less sign or speech use, more/less eye contact)

7. What did you enjoy most about the workshop?

8. What did you not enjoy about the workshop?

9. What did you find the most helpful during this workshop?

10. What did you find the least helpful during this workshop?

11. Do you think you will continue using baby sign with your children? If so, why? If not, why not?

12. Would you be interested in a refresher course in 6 months – 1 year?

   Yes   No

13. Would you be interested in monitoring your child’s development in 1 year?

   Yes   No

14. Please list the signs and words or any sign-word combinations your child is using.
APPENDIX B

List of ASL signs targeted throughout the 5-week course

Week 1
• Family members & Greetings
  ○ Hello
  ○ Good-bye
  ○ Mom
  ○ Dad
  ○ Brother
  ○ Sister
  ○ Grandma
  ○ Grandpa
  ○ I love you
  ○ Cousin
  ○ Aunt
  ○ Uncle
  ○ Baby
  ○ Boy
  ○ Girl
  ○ Please
  ○ Thank you
  ○ Good morning
  ○ Good night
  ○ My/Your

Week 2
• Food Items & Verbs
  ○ Want
  ○ Hungry
  ○ Thirsty
  ○ Give me
  ○ All done
  ○ More
  ○ Yes/No
  ○ Milk
  ○ Juice
  ○ Banana
  ○ Apple
  ○ Cookie
  ○ Cracker
  ○ Water
  ○ Hot/cold
- Orange
- Candy
- Eat
- Drink
- Cheese

Week 3
• Toys, Playtime & Animals
  - Play
  - Toys
  - Ball
  - Bear
  - Car
  - Airplane
  - Dog
  - Cat
  - Bird
  - Cow
  - Share
  - Horse
  - Elephant
  - Book
  - Tiger
  - Monkey
  - Bubbles
  - Outside
  - Bike
  - Walk

Week 4
• Emotions and Routines
  - Happy
  - Sad
  - Mad
  - Scared
  - Cry
  - Sorry
  - Sleepy
  - Up/down
  - Hurt
  - Diaper
  - Brush your teeth
  - Bath
  - Dirty
  - Clean
  - Help
o Shoes
o Clothes
o Where
o Go
o Sit
o Stop
Extra list/miscellaneous:
  • Red
  • Blue
  • Yellow
  • Green
  • Black
  • White
  • Noodles
  • Jump
  • Slide
  • Moon
  • Star
  • Sun
  • Home
  • Keys
  • Phone
  • Show
  • Look
  • Work
  • Ice cream
  • Music
CURRICULUM VITA

Melissa was born in El Paso, TX. She is the second of three children, and graduated from Bethel Christian School in May 2008. Melissa earned a 4-year Presidential Excellence Scholarship for the University of Texas at El Paso and began the 3-year undergraduate education program as a part of the 5-year Master’s Degree Program in the Department of Speech-Language Pathology. Upon completion of the 3-year undergraduate program, she applied to the graduate program for Speech-Language Pathology and was accepted. Melissa began her graduate school education in Fall 2011. At this time, she began her research on the impact of baby sign language on motor development in infants with two colleagues under the guidance of Dr. Vannesa Mueller. As a graduate student, Melissa was an active member and the external vice president of the National Student Speech Hearing and Language Association. She also presented her thesis data during a poster session at the Texas State Speech Hearing and Language Association Conference in March 2013 in Dallas, Texas. Melissa is expected to graduate with a Master of Science in Speech-Language Pathology Degree in May 2013.