What Current Clinical Research Really Says About Signing for Hearing Children

For most children, using sign language is an exciting activity based on muscles and movement, not just looking and listening. Small children love to learn to sign, just as they love to learn anything by doing, exploring, trying, touching and moving, not just by sitting and staring.

But what about all these claims of higher I.Q.s and fewer temper tantrums? Is this just the latest trendy fad? A newer version of how to create an infant Einstein?

There is nothing faddish about the benefits of signing. It has been carefully studied in clinical and university settings for over 25 years. Questions have been posed and researched: Does signing really help the hearing child? Does it improve I.Q.? Strengthen parent bonding? Increase confidence? Lessen misbehavior? Is it helpful in working with children with special needs? Are there any data to back up fears that a child will choose signing over normal speech and thus delay speaking? Unlike most studies which are filled with "no, but . . ." "yes, if . . ." and "on the other hand . . . " type of disclaimers, the carefully documented research on signing is universally positive.

There is one disclaimer. The real benefit of signing is to provide an enriching way to cause parent and child to spend quality time together, to increase ability, curiosity and joy. It also greatly enhances communication and bonding--some of the most valuable assets between any parent and child.

And, yes, it will help your child better share their needs with you, with the additional and widely verified side benefit of improving their mental activities.

So, should your child's school be encouraged (dare we say "pressured") to include ASL for a more effective early childhood curriculum? Frankly, the facts are easy to find, and they are impressive. Here are a few details you can share with your school's administrator (or your cautious spouse), with an easy-to-access list of articles and books, should anyone wish to do the research on their own.

8-13 POINT INCREASE IN I.Q. STILL EVIDENT AT AGE EIGHT.

In one of the most comprehensive studies over time, Linda P. Acredolo, from the University of California, Davis and Susan W. Goodwyn from California State University, Stanislaus and their associates have been studying the benefits of signing for over two decades. Their findings were summarized in a paper presented at the International Conference on Infant Studies in 2000 at Brighton, England (full citations below; many available online—this applies to all quotes given).

They found that the claim of increased I.Q. has held up through age eight (the longest period studied so far). They revealed that in blind test groups, the children who learned physical gesturing and signs showed an increased I.Q. of between 8 and 13 points, compared to the equivalent groups who were not taught signing. This not only greatly increased early language skills but the I.Q. difference was still apparent when the same groups were tested years later.

In six different test groups, the average difference based on the WISC-III Intelligence (I.Q.) test was:

- 114 for signing children as opposed to 102 for non-signers (12 point difference);
- 116 for signing children as opposed to 103 for non-signers (13 point difference);
- 109 for signing children as opposed to 101 for non-signers (8 point difference). .

In a similar paper they published along with Catherine A. Brown in the *Journal of Nonverbal Behavior* (2000, Vol. 24: 81-103), they concluded:

> The results . . . strongly support the hypothesis that symbolic gesturing facilitates the early stages of verbal language development. In a significant proportion of the comparisons between these two groups, infants who augmented their fledgling vocal vocabularies with symbolic gestures outperformed those who did not. The fact that no such advantage was found for the infants in the Verbal Training group provides reassuring evidence that the superior performance of the ST infants was not simply a function of their families being involved in a language-centered intervention program. *The explanation seems to lie instead within the gesturing experience itself* (Italics added).

TODDLER TEMPERS LESSENED, COMMUNICATION INCREASED, WITH SIGNING

In the same paper named above, Acredolo, Goodwyn and Brown also took a scientific evaluation as to how signing affects young behavior. Parents of young children told them repeatedly that:

> . . . the availability of symbolic gestures for at least some of the important things in their child's life made communication easier and interactions more positive. Request gestures (e.g., MORE, OUT) helped children get their needs met without crying, symbols for specific foods (e.g., GOLDFISH CRACKERS, CHEERIOS) provided important clarification, animal gestures (e.g., MONKEY, ZEBRA, GIRAFFE) helped them become active partners during book-reading, descriptive gestures (e.g., HOT, HAPPY, AFRAID) helped them share important insights about their environment, and all of the gestures helped clarify the children's initial, crude verbal labels (e.g., "Oh! You're doing your TURTLE gesture. I guess Tata means 'turtle!').

Among the other examples they learned from studying parents interacting with children who had been taught to sign, they learned these stories:

1. A mother was about to put a clown doll in bed with her 16-month old child, but the child signed the "afraid" gesture indicating the clown was the source of her cries and fears, not the solution to them.

2. A 14-month-old learned the "hot" sign and was able to inform his mother when the food, bath water and even sidewalk was uncomfortably or dangerously hot. To all these the authors concluded:

3. One mother in a mall saw her 13-month old sign "crocodile" and then let him stroll back to the racks of Izod insignias, showing true comprehension in a child so young.

Many parents love the idea that they can communicate these concepts at a young, pre-verbal age—that a very young child can indicate

when something is too hot; can identify specific animals by sight; can even express their preference for water, juice or milk and/or when they are full or want “more”.

BENEFITS APPEAR BEFORE AGE ONE.

In 2001, Dr. Marilyn Daniels, associate professor of speech communication at Penn State's Worthington Scranton Campus, published ten years of careful research in *Dancing With Words: Signing for Hearing Children's Literacy* (Bergin & Garvey).

Professor Daniels summarized a myriad of independent research in her book that conclude that while young children need much practice and patience to achieve and improve speaking and reading skills, they use their hands to communicate effortlessly and early. One mother with a restless boy under one, found that teaching a few simple signs helped him communicate his eating and drinking desires at about nine months. By age one he was signing that he was ready for a bath, or wanted to go out and play.

Another mother had a whiny nine-month-old boy. By twenty-eight months old, he was trying to teach his six-week-old sister to sign. Daniels concluded, "Knowing a second language, such as ASL, also boosts self-esteem of the children and their confidence in learning, as well as their awareness of the Deaf culture."

BUT WILL THE LOVE OF SIGNING DELAY A CHILD'S SPEAKING SKILLS OR DOES IT TRULY PROVIDE A "KICK-START" TO SPEAKING?

The fear that children might become so focused on signing that they delay learning how to speak has been a concern for some parents who want only the best for their children. It may even seem common sense. After all, some children crawl so effectively and quickly, they put off walking. That may be true with hands and legs—even then, in very few cases, and not for very long--but apparently it is not true with ears and mouths.

Certainly no evidence has been found of any delay of speaking due to signing. In fact, the opposite has been documented. Children actually speak sooner. Signing seems to "jump start" their verbal skills and love of communicating. From the same papers by Acredolo, Goodwyn and Brown again, they reported:

> Even these few examples provide tantalizing clues about the ways symbolic gesturing can facilitate and enrich interactions between parent and child . . . the good news from the present study is that parents need not worry about jeopardizing their child's vocal language development in order to take advantage of this easy alternative to words. *In fact, these data demonstrate clearly that the symbolic gesturing experience seems to "jump start" verbal development.* (Sources cited below; italics added)

Nicola Grove, M.Sc., L.C.S.T., and associates have has been researching and testing the benefits of sign language in England for both hearing and non-hearing children since the early 1980's. These tests were replicated throughout

the 1990's and into the 2000s. Some of the detailed research can be located at the web pages noted below.

Grove's findings include not only the details of how the human brain processes communication functions, whether verbal or through signs, but the correlation in growth between the two functions. For instance, she concludes: *"both deaf and hearing children, who are acquiring signs as a first language from their signing parents, develop vocabularies earlier than babies who are learning to speak"* (Italics added.) Grove further states, citing widely diverse studies from various experts:

> Several studies suggest that pairing signs with words leads to a transfer of learning, and the acquisition of spoken words (Bricker 1972; van Biervliet 1977; Penner & Williams 1982). A study by Reid (1984) found that not only were signs learned more quickly than words, *but that children who learned signs first, subsequently found it easier to learn words*. They seemed to have developed an understanding of the principle of labeling in sign, which then transferred to the spoken word (Italics added).

Kimberley Whaley, another pioneer in these studies, concluded similarly: "One of the concerns parents had was that children wouldn't learn to talk as quickly if they already knew the signs. We absolutely haven't seen that at all. What we found is that their first spoken words are usually words they had already learned to sign." In short, all evidence points to early and enhanced speaking skills—not delayed—come from signing.

ALL CHILDREN COMMUNICATE THROUGH THEIR HANDS—ALTERNATIVES TO PUSHING AND SHOVING?

Consider this fact. All children already do communicate physically from a very young age—through waving "bye, bye," blowing kisses, grabbing, crying, hugging, pushing and shoving. Since they are gaining physical communication skills anyway, signing expands on that "vocabulary" in a more positive way. At least that's what one Ohio State University professor discovered. This pilot program has taught sign language to hearing pre-schoolers for over twenty years and found that behavior problems greatly decreased. Associate Professor Kimberly Whaley, coordinator of the laboratory school, believes that her program to have been one of the first to teach sign language to pre-school hearing children. After noticing how often very young children communicated physically (through touching gently or pushing and shoving), she thought that perhaps simple signs could help. In this program, infants as young as 9 months old learned to use simple words like "eat," "more," "stop" and "share." She also found that when children could distinguish between asking for "juice" vs. "milk" some of the tantrums lessened. Signing can't promise an end to crying, whining and throwing tantrums. But when those tantrums are due to frustration due to inability to communicate, signing's alleviating affects are substantial.

SPECIAL BENEFITS FOR SPECIAL NEEDS?

The above studies have been concerned primarily with hearing and sighted children of average to above average intelligence. What about hearing children with special needs: Autistic, Down Syndrome, or children with significantly delayed speech or Apraxia? Here too, the research consists of nothing but good news. Signing can have an even more significant impact with these children.

For instance, Stephen M. Edelson, Ph.D., of the Center for the Study of Autism in Salem Oregon, has noted from many studies, that in autistic patients, " . . . research suggests that teaching sign language along with speech will likely accelerate a person's ability to speak (Creedon, 1976; Kopchick, Rombach, & Smilovitz, 1975; Larson, 1971; Miller & Miller, 1973)." The reasons, he suggests, have to do with PET brain scans showing that signing creates activity in the same area of the brain (Poizner, Klima, & Bellugi, 1990). Thus, he concludes, "when utilizing the Signed Speech method, the area of the brain involved in speech production is receiving stimulation from two sources (signing and speaking) rather than stimulation from one source". Additionally, he notes that much of the temper tantrum and disruptive actions carried on by autistic children can be related to the frustration caused by inability to communicate. "Many aberrant behaviors associated with autism and other developmental disabilities, such as aggression, tantrumming, self-injury, anxiety, and depression, are often attributed

to an inability to communicate to others. Signed Speech may, at the very least, allow the person to communicate using signs and may stimulate verbal language skills."

On the Apraxia-kids website, Clinical Therapist David Hammer suggests that signing is a good first prompt for children suffering from delayed-speech and the various forms of apraxia. He says that, "the reason that I like signing is that it can be brought close to the face to better assure that the child also focuses on oral cues provided." Sharon Gretz provides seven additional reasons why signing is helpful in these cases:

1) Reduced Frustration (children who cannot communicate become frustrated leading to tantrums and misbehavior);

2) Symbolic Communication (assigning meanings to symbols is part of language development in all children);

3) Expansion of Expressive Speech (although "slow of speech," signing allows these children to begin producing speech patterns for self-expression);

4) Successful Communication (giving the listener of better chance of understanding even while the child is pre-verbal);

5) Controls Rate of Speech (forcing the adult to "slow down" which allows the child to "catch up");

6) Serves as Visual Clues (the very thing children with apraxia need most to develop speech ability);

7) Kinesthetic Reinforcement (multiple ways to learn and develop by touching and doing).

In short, Gretz recommends signing whether the child has hearing problems or not.

Speech-language pathologist, Claire Donovan, is even more enthusiastic about using sign language to reach children with Down Syndrome. She writes that:

> "Sign language is often the tool they need to build their confidence communicating. When sign language is introduced at birth, it helps babies with Down syndrome . . . It also encourages eye contact and attention to movements long before she can coordinate all the movements required for speech. Understanding signs is easier for children too. Many signs look like the object or action they represent, whereas spoken words may be heard as meaningless combinations of sounds. . . . They become more attentive and responsive to their environment, which helps language learning move along. For example, all children wave 'bye-bye' before they speak the word. Sign language builds on the natural gestures we all use such as 'bye,' 'hi,' and 'come here' to create a visual message that accompanies the spoken word. It helps children learn the power, fun, and social aspects of communicating."

IT'S UNANIMOUS: OVER 20 YEARS OF RESEARCH LEADING TO THE SAME CONCLUSION

Scholars have been studying the benefits of physical gesturing and sign language on very young children since the early 1980s at least. Among these conclusions, universally acknowledged, are that teaching signing to deaf children is, of course, a necessity, but teaching those same skills to very young children who can hear perfectly . . .

1. Improves that child's ability to learn their spoken language even better and helps them gain language skills earlier and faster than those who did not learn signing.
2. Enables that child to grow up "bi-lingual" with abilities to learn communicate with from different sources (one based on hearing and the spoken word; one based on physical movement).
3. Increases I.Q. points by between eight and thirteen points—benefits which have remained to the oldest age tested to date.
4. Enables a young child to communicate needs, wants and fears earlier and better, thus decreasing misbehavior and temper tantrums.
5. Improves cooperation between very young children.
6. Is considered a source of fun physical activity, pride and self-esteem among the children.

7. Greatly enhances quality time and positive reinforcement between parent and child.
8. Has additional benefits when taught to special needs children with autism, apraxia, Down syndrome and other issues.

With this statistical information, schools should well be encouraged to introduce signing to very young children (well under a year old). The unmentioned and untested benefit that every parent instinctually knows is that more time spent with their child in meaningful learning activities results in tighter bonds, more security and love felt by the child, and a much closer and healthier parent-child relationship. Signing is a sign of love.

SOURCES CITED

For those who really want to dig into the decades of published research by scholars at many universities, both national and international, consider these recent scholastic articles and book length sources:

Linda Acredolo, Susan Goodwyn and Douglas Abrams: *Baby Signs: How to Talk with Your Baby Before Your Baby Can Talk, New Edition* (McGraw-Hill, 2002).

Linda P. Acredolo, L. P., and Susan W. Goodwyn, (July 2000). "The long-term impact of symbolic gesturing during infancy on IQ at age 8." Paper presented at the meetings of the *International Society for Infant Studies*, Brighton, UK. (See research online at: www.babysigns.com/index)

Linda Acredolo and Susan Goodwyn (1985). "Symbolic gesturing in language development: A case study." In *Human Development*, 28, 40-49.

Linda Acredolo and Susan Goodwyn (1988). "Symbolic gesturing in normal infants." In *Child Development*, 59, 450-466.

Linda Acredolo and Susan Goodwyn (1990). "The significance of symbolic gesturing for understanding language development." In R. Vasta (Ed.), *Annals of Child Development* (Vol. 7, pp. 1-42). London: Jessica Kingsley Publishers.

Linda Acredolo, L. P., & Goodwyn, S.W. (1997). "Furthering our understanding of what humans understand." In *Human Development,* 40, 25-31.

Linda Acredolo, Susan Goodwyn, Karen Horobin, and Yvonne Emmons (1999). "The signs and sounds of early language development." In L. Balter & C. Tamis-LeMonda (Eds.), *Child Psychology: A Handbook of Contemporary Issues* (pp. 116 – 139). New York: Psychology Press.

M. Daniels, (October, 1994). "The effects of sign language on hearing children's language development." In *Communication Education,* 43, 291-298.

M. Daniels. (1996). "Seeing language: The effect over time of sign language on vocabulary development in early childhood education." In *Child Study Journal,* 26, 193-208.

M. Daniels. (2001). *Dancing with Words: Signing for Hearing Children's Literacy*. Westport, Connecticut: Bergin and Garvey. (http://www.eurekalert.org/pub_releases/2001-11/ps-sle112001.php).

Claire Donovan, "Teaching Sign Language," in *Disability Solutions*, January/February 1998, Volume 2, Issue 5, p. 1, 3-7; (www.csdsa.org).

Stephen M. Edelson, Ph.D., "Signed Speech or Simultaneous Communication" (www.autism.org/sign.html).

Susan Goodwyn, Linda Acredolo, and Catherine Brown (in press). "Impact of symbolic gesturing on early language development." In *Journal of Nonverbal Behavior*.

Susan Goodwyn, Linda Acredolo, and Catherine Brown (2000). "Impact Of Symbolic Gesturing On Early Language Development." In *Journal of Nonverbal Behavior*, 24 (2), pp. 81-103.

Susan Goodwyn and Linda Acredolo, (1993). "Symbolic gesture versus word: Is there a modality advantage for onset of symbol use?" In *Child Development*, 64, 688-701.

Susan Goodwyn and Linda Acredolo (1998). "Encouraging symbolic gestures: Effects on the relationship between gesture and speech." In J. Iverson & S. Goldin-Meadows (Eds.) *The Nature And Functions Of Gesture In Children's Communication* (pp. 61-73). San Francisco: Jossey-Bass.

Sharon Gretz, M. Ed., "Using Sign Language With Children who Have Apraxia of Speech," (www.apraxia-kids.org).

Nicola Grove, "Current Research Findings to Support the Use of Sign Language with Adults and Children..." (see the entire paper at **www.makaton.org/research**.).

J. Hafer, (1986). *Signing For Reading Success*. Washington D.C. Gallaudet University Press.

David Hammer, "Sign Language and/or Cueing to Facilitate Speech Production in Children with Apraxia of Speech" (www.apraxia-kids.org).

Brie Moore, Linda Acredolo, & Susan Goodwyn (April 2001). "Symbolic gesturing and joint attention: Partners in facilitating verbal development." Paper presented at the *Biennial Meetings of the Society for Research in Child Development.*

Kimberly Whaley, "Teaching Infants to Use Sing Language," (www.newswise.com/articles/view/?id=SIGNLANG.OSU).

R. Wilson, J. Teague and M. Teague (1985). "The Use of Signing and Finger spelling to Improve Spelling Performance with Hearing Children" in *Reading Psychology,* 4, 267-273.