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VISUAL LANGUAGE & VISUAL LEARNING

RESEARCH BRIEF:

VISUAL LANGUAGE & VISUAL LEARNING

THE IMPORTANCE OF FINGERSPELLING FOR READING

JULY 2010

LEARNING FROM RESEARCH # 1

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Key Findings on the Importance of Fingerspelling for Reading:

- Deaf families fingerspell to their deaf children when they are very young.
- Early exposure to fingerspelling helps these children become better readers.
- Fingerspelling, reading, and writing are interrelated.
- Fingerspelling facilitates English vocabulary growth, and larger the lexicon, the faster new vocabulary is learned.
- Fingerspelling positively correlates with stronger reading skills. Deaf and hard of hearing children who are good fingerspellers are good readers, and vice versa.

Fingerspelling and American Sign Language

On the most simplistic level, fingerspelling can be defined as the use of handshapes to represent letters of the alphabet. Indeed, before the complexity of fingerspelling was documented, researchers thought fingerspelling was merely a manual representation of English orthography (print).[1] They believed fingerspelling was primarily for representing proper nouns or for English words without a sign equivalent.[2,3] This form of fingerspelling is referred to by Padden as neutral fingerspelling.[4] Fingerspelling, though, is complex and integrates American Sign Language (ASL) in systematic ways; it is not just a system to borrow English words.[5,6,7] While fingerspelling can be neutral, it can also expand the ASL lexicon (vocabulary) through the use of abbreviations, two-word compounds, initialized signs, fingerspelled compounds, and through the process of lexicalization (see appendices).

Fingerspelling and Classroom Instruction

Native ASL signers use fingerspelling for 10-15% of their signed discourse, depending on the topic.[8] In addition, deaf teachers use over 50% more fingerspelled words than hearing teachers during classroom instruction.[9] Padden found that hearing L2 learners of ASL, including classroom teachers, tended to use neutral fingerspelling almost exclusively; as a result, children in these settings often miss the advantages of more advanced forms of fingerspelling.[4]

Deaf Families, Fingerspelling, and Reading

Deaf families fingerspell abundantly when communicating with their young children because they understand the important role that fingerspelling plays in visual learning. At 24 months of age, deaf children with deaf parents have vocabulary sizes that are comparable to that of hearing children who are learning a spoken language.[10] Additionally, older deaf and hard of hearing children from deaf families tend to read at higher levels than deaf and hard of hearing children from hearing families.[11] Fingerspelling likely contributes to this success. Unfortunately, young deaf and hard of hearing children from hearing families are not generally given the same early learning opportunity. Indeed, the absence of fingerspelling is particularly evident in preschools for deaf and hard of hearing children.[9] To understand the role of fingerspelling in language acquisition and later literacy, it is important to understand how fingerspelling is naturally acquired by deaf and hard of hearing children with deaf families.

When do deaf children acquire fingerspelling?

Deaf children of deaf parents can begin to sign as early as eight months.[12] Early attempts at fingerspelling appear around 13 months of age [13,14,15,16,17,18,19] with the first fingerspelled word appearing as young as two years of age.[15,17,18] Young deaf children do not pay attention to the execution of each individual handshape in the given fingerspelled word. Instead they perceive fingerspelled words as whole units or signs.[20] Akamatsu coined the term *movement envelope* to describe the movement of the hand while fingerspelling.[13] Deaf children's recognition of this movement envelope corresponds with their acquisition of signs. Deaf children in deaf families have also been observed to use sequences of three or four signs at two years of age.[12,14,21] This early visual language development in deaf children is similar to early spoken language development in hearing children. The developmental stages and trajectories of fingerspelling have been documented (see appendices).

Fingerspelling and Reading

Grushkin stated that fingerspelling provides a linguistic link to English vocabulary and syntax.[24] Certainly, the importance of fingerspelling in the education of deaf and hard of hearing children has been documented in the literature. [4,9, 18,19,23,25,26,27,28,29,30,31] One comprehensive study,

conducted by Padden and Ramsey, investigated reading ability and specific language skills of deaf students in third through seventh grade.[9] The results revealed that knowledge of specific ASL structures, including fingerspelling, correlates with reading achievement. In this study, children who scored better on reading tests were competent in *associative skills,* such as the ability to write down words that were fingerspelled to them as well as the ability to translate initialized signs. Looking specifically at performance on the fingerspelling tasks, fingerspelling ability significantly correlated with reading comprehension: "better readers…were better at recognizing fingerspelled words and writing them down in print" (p. 185).

Fast Mapping New Vocabulary

Several findings have emerged from studies on the relationship of fingerspelling and vocabulary growth. As typically developing children move toward preschool age, they start learning new words on their own.[32] This rapid word learning is attributed to fast mapping, which involves cognitive processes whereby new concepts are learned based only on brief exposure to a given unit of information.[33] Studies on word-learning abilities in deaf and hard of hearing preschool children indicate that word-learning abilities were related to the size of the children's expressive vocabulary but not their chronological age. [34,35] Regardless of the communication modality and the hearing status of the parents, performance was strongly related to the number of vocabulary words the children had in their lexicon. That is, it is the size of the vocabulary that makes indirect word learning relatively easy. In another study, students who had higher reading levels performed better at fast mapping fingerspelled words than those students who had lower reading levels.[31]

Haptonstall-Nykaza & Schick found that students' retention of new vocabulary increased when lexicalized fingerspelling was added to instruction.[36] Furthermore, Hile's work revealed a strong relationship between fluency in fingerspelling, reading, and vocabulary skills.[26]

The research is clear that fingerspelling, reading, and writing skills are intertwined and that they converge for deaf children, who have early access to visual language, around the third grade.[4] The convergence of these skills facilitates literacy development in deaf and hard of hearing children, allowing them to achieve reading levels that exceed the historically low norms.

Integration of Research in Education

The VL2 center publishes research briefs as a resource for educators and parents. The goal is to inform the education community of research findings, to summarize relevant scholarship, and, to present recommendations that educators and parents can use when addressing the multifaceted challenges of educating deaf and hard of hearing children.

The information provided in this brief is intended to clarify the importance of fingerspelling in the early language development of deaf and hard of hearing children. In addition to the research brief, appendices have been created that provide supplementary information for educators to share with families or to use when integrating fingerspelling into classroom practices. The appendices address:

- *Instructional Strategies for Using Fingerspelling*
- *The Developmental Process in Fingerspelling Acquisition*
- *Expanding the ASL Lexicon through Fingerspelling*

Research briefs are available at vl2.gallaudet.edu.

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Appendix A.
Instructional Strategies for Using Fingerspelling

Instructional Strategies for Using Fingerspelling

Deaf teachers use visual strategies for incorporating fingerspelling into classroom instruction. Studies on these visual strategies show that they are a natural part of classroom interaction and are used to promote greater understanding and retention of academic material.

Three such instructional strategies for using fingerspelling are as follows:

Chaining

Chaining is used for introducing new concepts or new vocabulary terms. Chaining creates associations by connecting signs, fingerspelling, and the printed/written word in a sequence, with one format reinforcing the previous one. Through chaining, the teacher provides multiple ways for the students to learn the word and concept. In addition, teachers may use objects, pictures, or multimedia to reinforce the concepts.

For example, when teaching the word, tornado, a teacher might choose one of the following sequences:

1) Point to the word tornado written on the board;

2) fingerspell T-O-R-N-A-D-O; and

3) sign TORNADO.

Or:

1) Fingerspell T-O-R-N-A-D-O;

2) sign TORNADO; and

3) write tornado on the board.

Sandwiching

The sandwiching technique alternates between fingerspelling and signing. This method also reinforces the equivalency of ASL and English.

1) Fingerspell T-O-R-N-A-D-O;

2) sign TORNADO; and

3) fingerspell T-O-R-N-A-D-O again.

Or:
1) Sign TORNADO;

2) fingerspell T-O-R-N-A-D-O; and

3) sign TORNADO again.

Lexicalized Fingerspelling

New signs are created through a process where fingerspelled words are altered or lexicalized to become more sign-like. Commonly referred to as *loan signs*, these signs sometimes omit letters (#JOB) while others blend the handshapes seamlessly (#BUS). Through this process, a loan sign is formed. Lexicalized fingerspelled signs include nouns, verbs, adjectives, conjunctions, interjections and wh-words.

Lexicalized fingerspelling transforms the fingerspelled word into a sign-like visual image. Deaf teachers often use this technique; first, they produce a neutral version of a fingerspelled word, and then follow that with a lexicalized version. This process supports visual memory and facilitates retention.

Common Fingerspelled Loan Signs

#BANK	#BACK	#OFF	#ON	#IF
#SALE	#EARLY	#BUT	#BUS	#CAR
#WHAT	#DO	#SO	#OK	#JOB
#YES	#NO	#DOG	#TOY	#FIX

Appendix B.
The Developmental Process in Fingerspelling Acquisition

Typically fingerspelling and American Sign Language acquisition occurs simultaneously; however, this chart (see back page) focuses upon approximate developmental trajectories for fingerspelling.

Stage One

The earliest handshapes produced by deaf and hard of hearing toddlers use the whole hand; more complex handshapes are developed later as dexterity improves. Substitution of visually similar handshapes in the place of more complex ones is common in young children. In addition, transitioning between some letters (e.g. D and R) requires the more advanced motor skills acquired at a later age.

When ready for preschool, children exposed to ASL from birth know which vocabulary words to fingerspell, such as names of people, places, and simple proper nouns. Signing children are developmentally ready to understand how fingerspelling represents printed English. It is during this time that children begin to explore the relationship between fingerspelled handshapes and the printed letters.

Stage Two

The second stage of fingerspelling development focuses on a shift of attention to individual letters when attempting to fingerspell. Deaf children in this stage become aware of individual letters, and this is similar to the development of the alphabetic principle in hearing children. This occurs around four years of age for deaf children of deaf families. The children, though, often have handshape substitutions (5 handshape for W). Stage two continues until approximately third grade for children with early access to visual language, but it can continue until later for children who did not have the advantage of early fingerspelling.

Stage Three

The third stage of fingerspelling development is when the child has finally mastered neutral fingerspelling, including the appropriate handshapes in the correct sequence with correct movement. In this stage, which occurs around third grade for native signers but can continue to adolescence, there is a convergence of skills or fingerspelling synthesis when the child is able to fingerspell a word, write the word, and understand the word when someone else fingerspells it. That is, reading, writing, and fingerspelling are integrated to the extent that each supports the other.

8-12 months	12-24 months	24-36 months	36-48 months	48+ months
Finger babbles in response to conversations.	Uses simple handshapes to form signs, mostly whole-hand letters and numbers/ handshapes: B, C, O, A, S, 1 and 5.	Uses handshapes of increasing complexity, such as L, G, F, Q, D, Z, Y, I, and J, to form signs.	Uses more handshapes of increasing complexity, such as V, H, W, U, T, H, K, P, X, Y, R, E, M, and N to form signs.	Begins development of the alphabetic principle by learning that lexicalized signs are made of handshapes.
First signs may appear.	Perceives fingerspelled words as a whole unit, known as a *movement envelope.*	Understands simple fingerspelled words (own name, pet's name, etc.).	Uses lexicalized signs abundantly, e.g. BUS, TV, and NO.	
Uses pre-linguistic gestures.	Early attempts at fingerspelling, sometimes to self.	Uses lexicalized fingerspelling to spell own name and names of others.		
	Begins using lexicalized fingerspelling.			

Appendix C.
Expanding the ASL Lexicon Through Fingerspelling

A unique feature of American Sign Language is how fingerspelling expands the lexicon.

Neutral Fingerspelling

Commonly fingerspelled English words, such as proper nouns (e.g., names of people, cities, companies, brand names, and technical terms), are referred to as *Neutral Fingerspelling*. Hearing L2 learners of ASL, including classroom teachers, tend to only use this type of fingerspelling.

Lexicalized Fingerspelling

New signs are created through a process where fingerspelled words are altered or lexicalized to become more sign-like. Commonly referred to as *loan signs*, these signs sometimes omit letters (#JOB) while others blend the handshapes seamlessly (#BUS). Through this process, a loan sign is formed. Lexicalized fingerspelled signs include nouns, verbs, adjectives, conjunctions, interjections and wh-words.

Abbreviations

ASL integrates abbreviations or shortened words. Examples of abbreviated signs are “A-P-T” for apartment and “R-E-F” for refrigerator. Interestingly, some state abbreviations that were lexicalized in the past (e.g., OKLA for Oklahoma) are still used instead of the two-letter abbreviations.

Two-Word Compounds

Two-word compounds in English can be represented through the use of an ASL sign that incorporates the handshapes corresponding to the first letters of the English words, such as in BOARD OF TRUSTEES and SOCIAL-WORK.

Initialized Signs

An initialized sign uses the handshape that corresponds to the first letter of a written word (e.g., **U**NIVERSITY). Some common initialized signs are items in a category, such as colors. Another commonly initialized group of words are those words associated with a concept or cluster, such as **G**ROUP, **C**LASS, **F**AMILY; these share the same location and movement, but the initialized handshape varies.

Signed-fingerspelled Compounds

Signed-fingerspelled compounds are another example of how fingerspelling is integrated into ASL. With this category, usually the first segment of a compound is signed while the second segment is fingerspelled (e.g., BLACK+M-A-I-L).

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