Why Am I Here?
how deaf children learn

WHAT PARENTS AND TEACHERS NEED TO KNOW

Translated by CHEN Yi Hin

聾童如何學習
Why Am I Here?

• “Deaf children are not hearing children who can’t hear”

• Deaf students can learn as much as hearing peers when taught by skilled teachers of the deaf
What Do We Know and Need to Know?

- What are the cognitive differences between deaf and hearing learners (and among deaf learners)?
- How do cognitive differences affect language comprehension, literacy, and learning?
- How do (some) teachers deal with those differences in teaching methods and materials?
Cognitive Differences likely to Influence Learning Outcomes for Deaf Students

• Memory
• Visual information processing
• Concept learning and knowledge organization
• Executive functioning and metacognition
Memory

• Hearing adults and children > deaf adults and children, especially (but not only) in memory for sequential information
  – Words, signs, text (*Banks et al.*, 1990; *Krakow & Hanson*, 1985)
  – Figures, pictures (*Blair*, 1957; *Liben*, 1979)
    …so it’s not just about language

• Native signers have better visual-spatial memory than sequential memory, and better than hearing non-signers (*Hall & Bavelier*, 2010)
There are 4 cars.
The orange car is faster than the green car.
The red car is faster than the orange car.
The yellow car is faster than the red car.
Is the yellow car is faster than the green car?
Four-Term Series Problems

Correct in 2 minutes

[Bar chart showing comparison between Deaf and Hearing responses]

Deaf
Hearing
What Do We Know and Need to Know?

- Memory \([\text{short-term memory or working memory}]\)

- Having an ability is not the same as knowing when and how to use it

- Can we teach it?
- How can we use it in the classroom?
Cognitive Differences likely to Influence Learning Outcomes for Deaf Students

- Memory
- Visual information processing
What We Know vs. What We Think We Know about Educating Deaf Learners

• Deaf children are “visual learners”
  (Marschark & Hauser, 2012)
  – Signers faster, more accurate than nonsigners generating complex visual images  (Emmorey et al., 1993)
Deaf Children are “Visual Learners”

• Do deaf learners have better visual-spatial skills?

• Hearing learners ≥ deaf learners
  (Blatto-Vallee et al., 2007; Morrison et al., 2012)
Deaf Children are “Visual Learners”

• Deaf children are “visual learners”
  – Hearing learners ≥ deaf learners in visual-spatial skills
    (Blatto-Vallee et al., 2007; Morrison et al., 2012)
  – No difference between early and late signers
  – Less hearing is linked to better scores
  – Performance predicts deaf students’ math scores

• Having an ability is not the same as knowing when and how to use it
Cognitive Differences likely to Influence Learning Outcomes for Deaf Students

- Memory
- Visual information processing
- Concept learning and knowledge organization
  [Semantic or long-term memory]
PPVT Scores of University Students

Estimated Marginal Means

9 10 11 12 13 14 15 16 17 adult

Deaf

Hearing
What Do We Know and Need to Know?

• Concept learning and knowledge organization

• Do deaf and hearing learners acquire concepts in similar ways? (Marschark & Woll, 2012)

• How are concepts activated by signs, words, and things? (Hermans, Knoors, Ormel, & Verhoeven, 2008)

• How do these differences affect their use in the classroom?
Cognitive Differences likely to Influence Learning Outcomes for Deaf Students

• Memory
• Visual information processing
• Concept learning and knowledge organization
• Executive functioning and metacognition
Executive Functioning and Metacognition

• “Higher-order cognition”
  – Controlling of one’s own behavior
  – Self-monitoring of comprehension and learning
  – Knowing when to use context and prior knowledge
Bottom-up and Top-down Aspects of Reading

**TOP**

Knowledge

- conceptual (words, things)
- strategic (problem solving)
- metacognitive / metalinguistic

**BOTTOM**

discourse structure
- grammar
- vocabulary
- morphology
- phonology/orthography

CERP Center for Education Research Partnerships
Bottom-up and Top-down Aspects of Reading

What you know

Words on the page
Language Comprehension Involves Bottom-up and Top-down Processing

**TOP**

Knowledge

- conceptual (words, things)
- strategic (problem solving)
- metacognitive / metalinguistic

____________________________

discourse structure

- grammar
- vocabulary
- morphology

- phonology/orthography

**BOTTOM**

CERP

Center for Education Research Partnerships
Learning (Concepts, Language, Academic, and Social) Involves Bottom-up and Top-down Processing

**TOP**

Knowledge
- conceptual (words, things)
- strategic (problem solving)
- metacognitive / metalinguistic

**BOTTOM**

“ discourse structure
- grammar
- vocabulary
- morphology
- phonology/orthography ”
Liben (1979)

Marschark & Everhart (1999)
What Do We Know and Need to Know?

• Executive functioning and learning

• Having knowledge is not the same as knowing when and how to use it

• How can we teach deaf students to better monitor language comprehension and learning?

• How can we increase their use of knowledge we know they have?
Which is the cause?

Instructions:
Your avatar needs help. Choose the correct image. Careful: two mistakes and you lose!

The passengers do not remove Anabel from the roadside.

Cause:
- The dog stands right in front of Anabel

Effect:
- Sophie sits in the back row of the bus
- Sophie visits the new Sport Complex
Sophie and Mitch spread out their towels on the terrace.

Ben and Luke decide to have a race.

Sophie gives Ben a friendly speech about winners and losers.

What happens during? What happens after?

Sophie and Ben go to the new Sports Complex in town.

Sophie gives Ben a friendly speech about winners and losers.

Sophie and Mitch spread out their towels on the terrace.
What Does It All Mean?
What Does It All Mean?

• Deaf students’ challenges in school are related to differences in language comprehension, cognition, and learning strategies, not just language modality.

• Deaf and hearing children have different knowledge, backgrounds, experiences, and learning strategies.
What Does It All Mean?

• Differences ≠ disabilities
  – Cognitive differences can be strengths, weaknesses, or just differences, but all add to diversity in the classroom

• Deaf students can learn as much as hearing peers when taught by skilled teachers of the deaf
  – Teachers (and students) must understand the differences and adjust to them
Take-Home Messages
Take-Home Messages

• Don’t believe everything you read
• Beware generalizations (and simple answers)
• Deaf children aren’t hearing children who can’t hear
• If we want to improve literacy and academic outcomes, it’s not just about language
• We need to ask the right questions, even if they are difficult questions