

The 2014 Symposium on Sign Bilingualism and Deaf Education

DOES EARLY SIGN LANGUAGE INPUT MAKE A DIFFERENCE ON DEAF CHILDREN WITH AUDITORY BRAINSTEM IMPLANTS?

Chris K.-M. YIU,
Emily LAM, Tammy LAU

Jockey Club Sign Bilingualism and Co-enrollment in
Deaf Education Programme



捐助機構
Funded by:



香港賽馬會慈善信託基金
The Hong Kong Jockey Club Charities Trust

Acknowledgement



賽馬會手語雙語共融教育計劃
JOCKEY CLUB SIGN BILINGUALISM AND
CO-ENROLMENT IN DEAF EDUCATION PROGRAMME

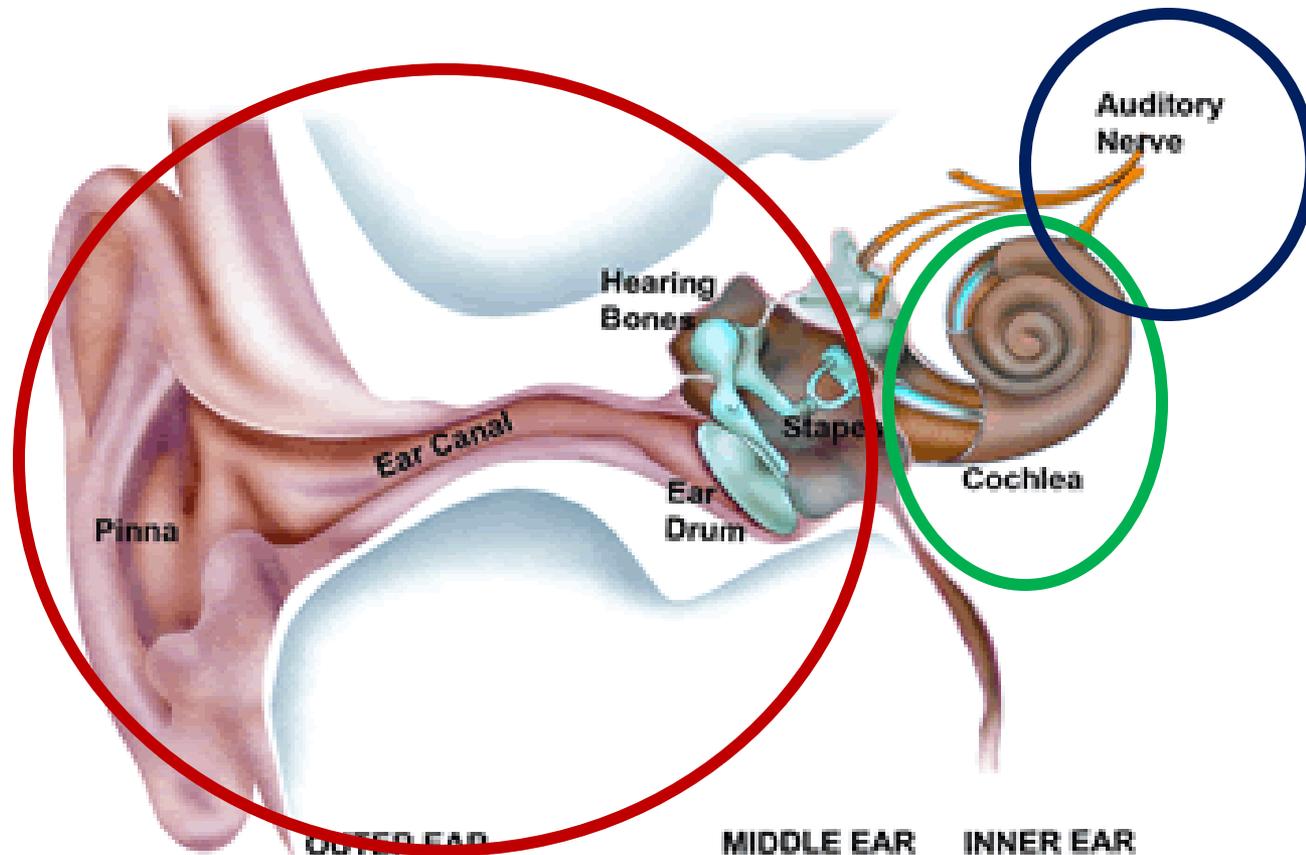
捐助機構 Funded by:



香港賽馬會慈善信託基金
The Hong Kong Jockey Club Charities Trust

Background

Children may suffer from different types of hearing loss – depends on the site of lesion

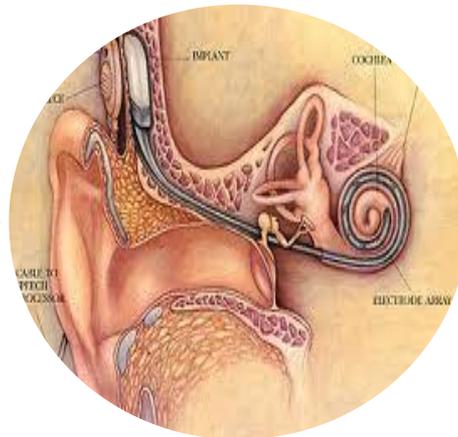
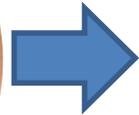


Background

Different types of hearing technology have been developed:



Hearing Aids



Cochlear Implants



Auditory Brainstem Implants

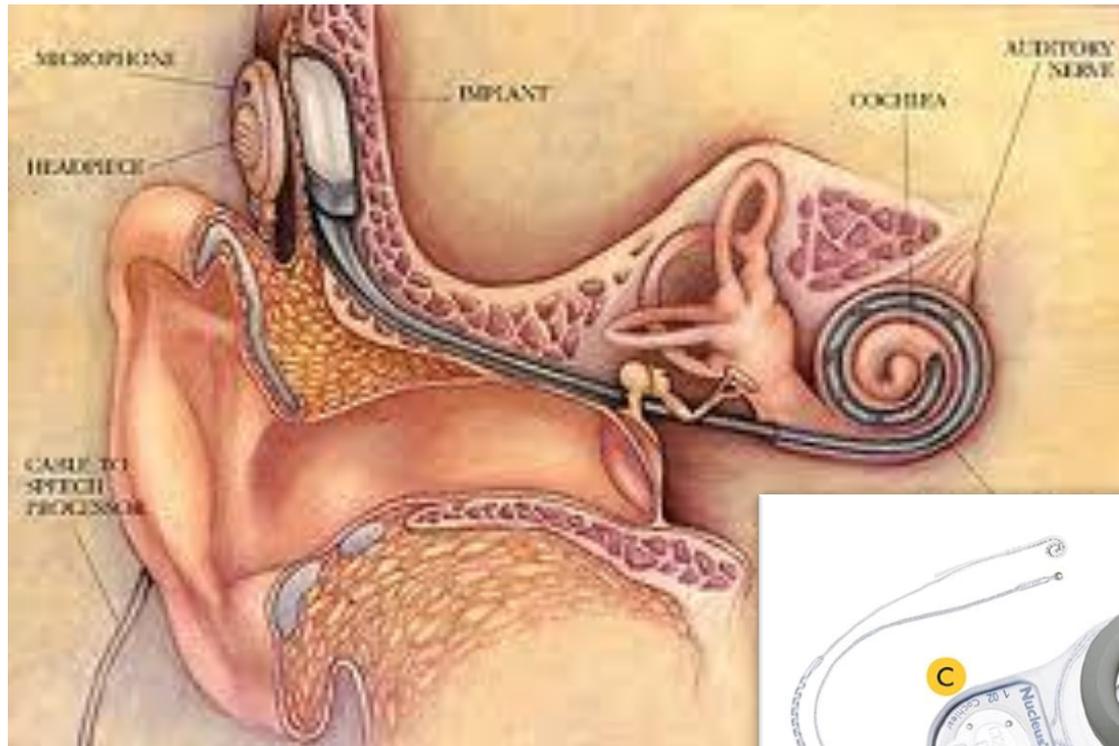
Background

Auditory Brainstem Implant (ABI) was typically used for people with acoustic tumours.

It is now also an option for deaf children with no cochlear nerve or with cochlear disorders such as nerve that could not benefit from a CI e.g. absence of or incomplete development of cochlear nerve (Colletti & Shannon, 2005).

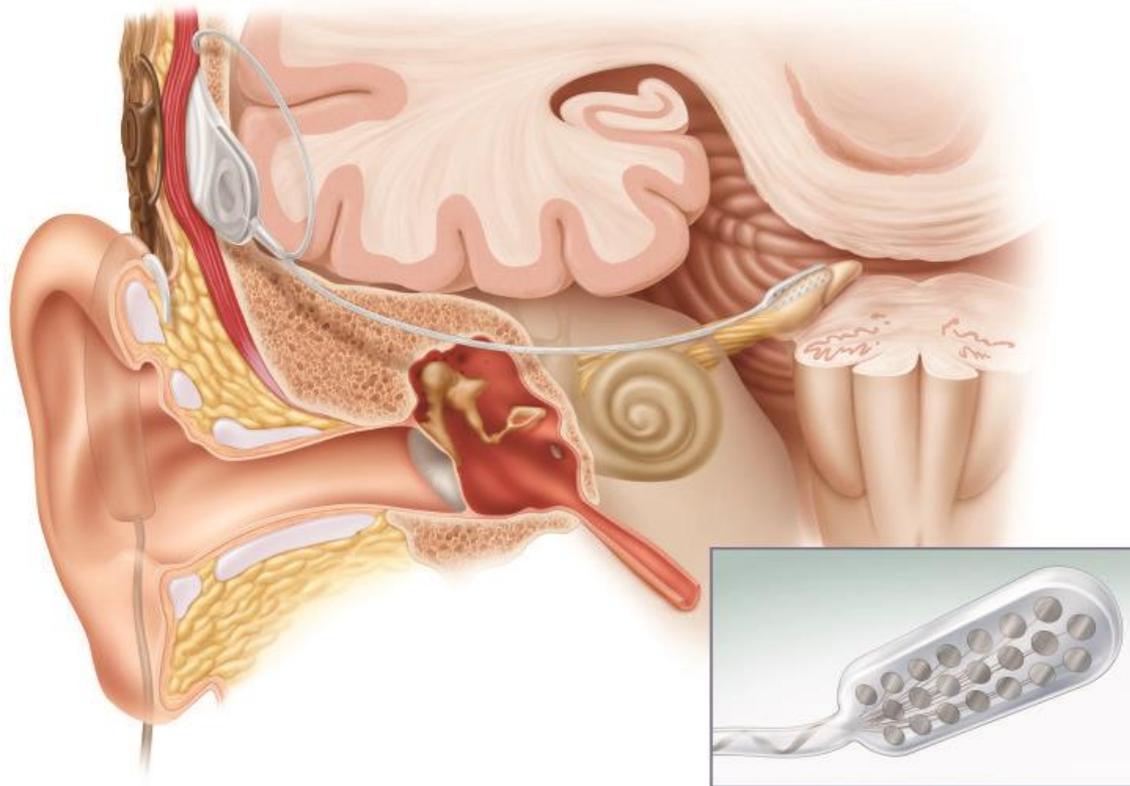
人工耳蝸 (Cochlear Implant)

Insertion of electrodes into the cochlear



腦幹植入 (Auditory Brainstem Implant)

Placing the electrodes onto the brainstem



Background

- Children with ABI still face the risk of inaccessibility to linguistic input in their oral language development.
- Recent advancement in research on sign linguistics and sign language acquisition has enabled us to reconsider the possibility that signed language may support spoken language development, no matter in their oral or written form (see Tang, Lam and Yiu, 2014).

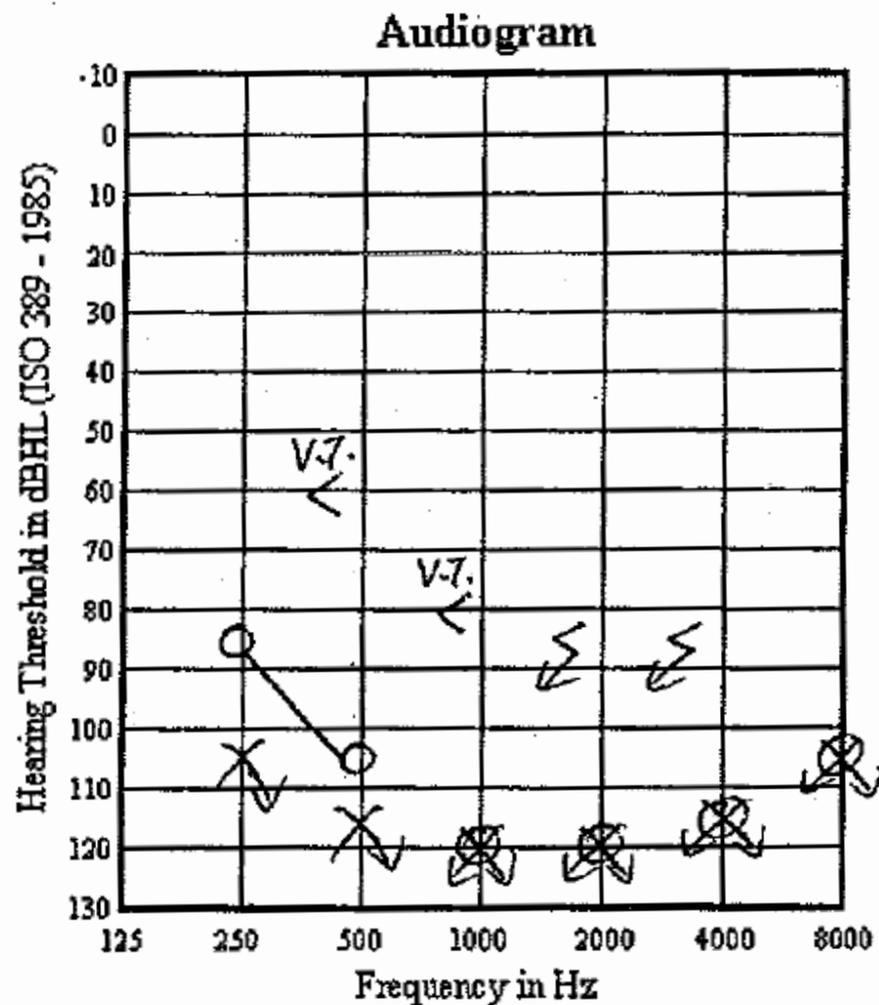
About the Study

- A case study of two deaf children with ABI with one receiving signed language exposure at an early age of 1;3, and the other as late as 5;6.
- To examine their language development and explore the possible impact of early sign language learning to deaf children with ABI
- Both of them were admitted in a Sign Bilingualism and Co-enrolment (SLCO) Programme

ABOUT THE SUBJECTS: KC AND MY

KC

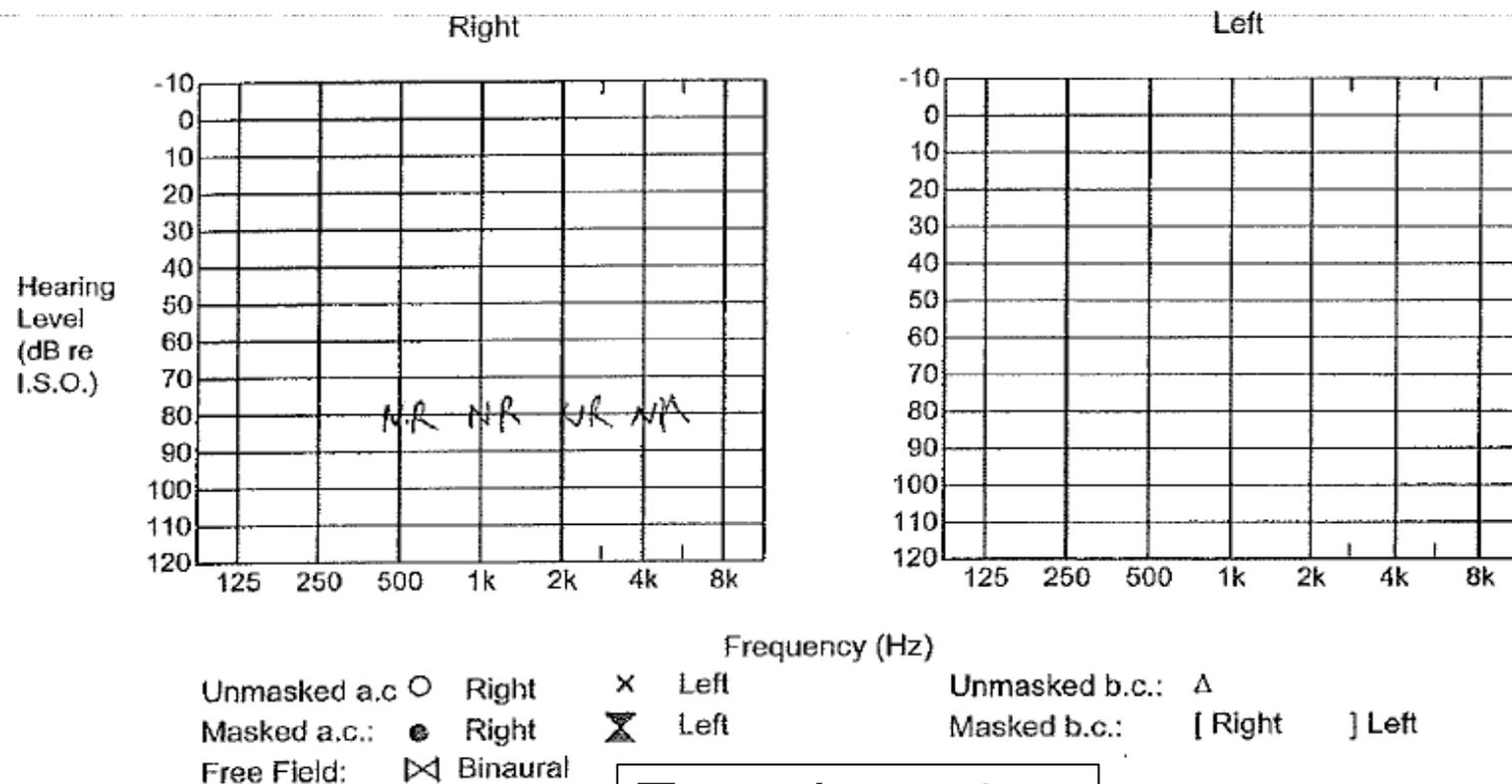
- M / 6;7
- Bilateral profound hearing loss with auditory neuropathy
- CI at 1;6 in 2008
- ABI done at 2;8 in 2009



Tested at 5;1

MY

- F / 6;8
- Bilateral profound hearing loss
- CI done at 2;10 in 2009; ABI done at 3;5 in 2010



Tested at 5;0

Background information (as at June 2013)

	KC	MY
Gender	M	F
Date of birth	25 Nov, 2006	21 Oct, 2006
Age	6;7	6;8
Hearing loss	Bilateral Profound	Bilateral Profound
CI implantation	1;6 (left)	2;10 (left)
ABI implantation	2;8	3;5
Parents	Hearing	Hearing
Began to learn HKSL at	1;3	5;6
Admitted to the SLCO Programme	3;10	5;6
Before SLCO Programme	Special Child Care Centre	Special Child Care Centre

ASSESSMENT BATTERIES

Assessments (as at June 2013)

Language	Area of Assessment	Test
Signed (HKSL)	Grammatical Knowledge <ul style="list-style-type: none"> - Comprehension - Production 	Hong Kong Sign Language Elicitation Tool (developed by CSLDS)
	Narratives	Narratives Assessment – Frog Story
Literacy (written Chinese)	Vocabulary <ul style="list-style-type: none"> - Picture selection - Word recognition - Reading aloud - Word/sentence making 	Pre-school and Primary Chinese Literacy Scale, PPCLS (Li, 1999)
	Grammatical Knowledge <ul style="list-style-type: none"> - Word re-ordering 	Assessment on Chinese Grammatical Knowledge (KG version, developed by CSLDS)

Assessments (as at June 2013)

Language	Area of Assessment	Test
Oral (Cantonese)	Speech Perception - Picture selection	Cantonese Basic Speech Perception Test (CBSPT) (Lee, 2006)
	Receptive Vocabulary - Picture selection	Hong Kong Cantonese Receptive Vocabulary Test (CRVT) (Lee, Lee & Cheung, 1996)
	Receptive and Expressive Language - - Acting out - Picture description - ...	Reynell Developmental Language Scales, Cantonese Edition (RDLS-C) (Reynell, 1987)

SIGN LANGUAGE

KC & MY (HKSL -ET)

	Receptive Language	Productive language	Total
KC	47.90%	45.20%	42.50%
MY	30.21%	4.69%	17.45%

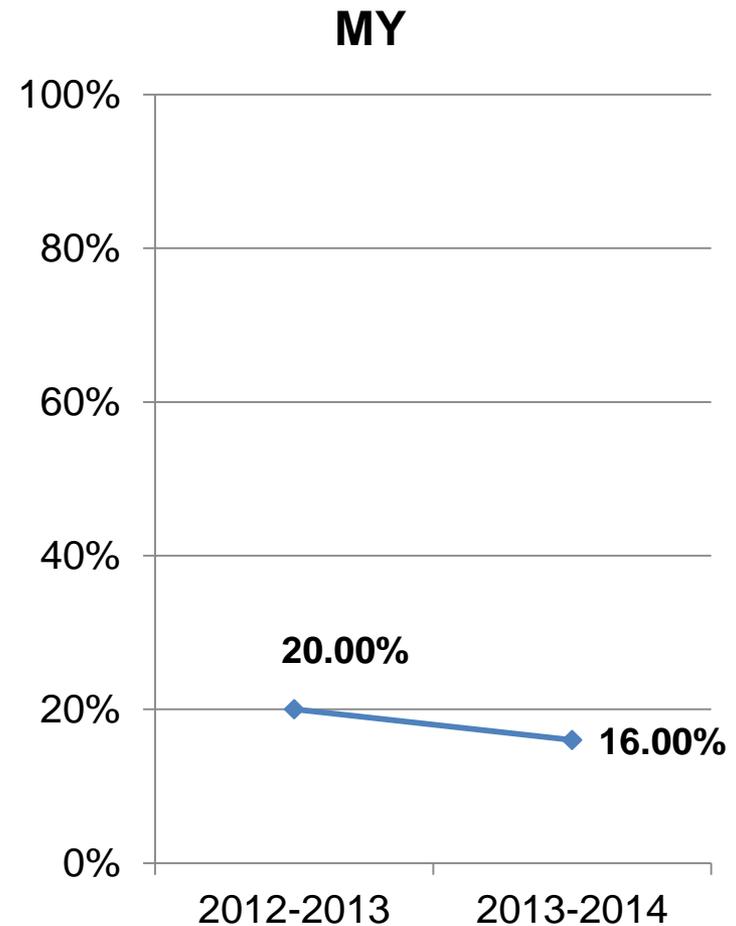
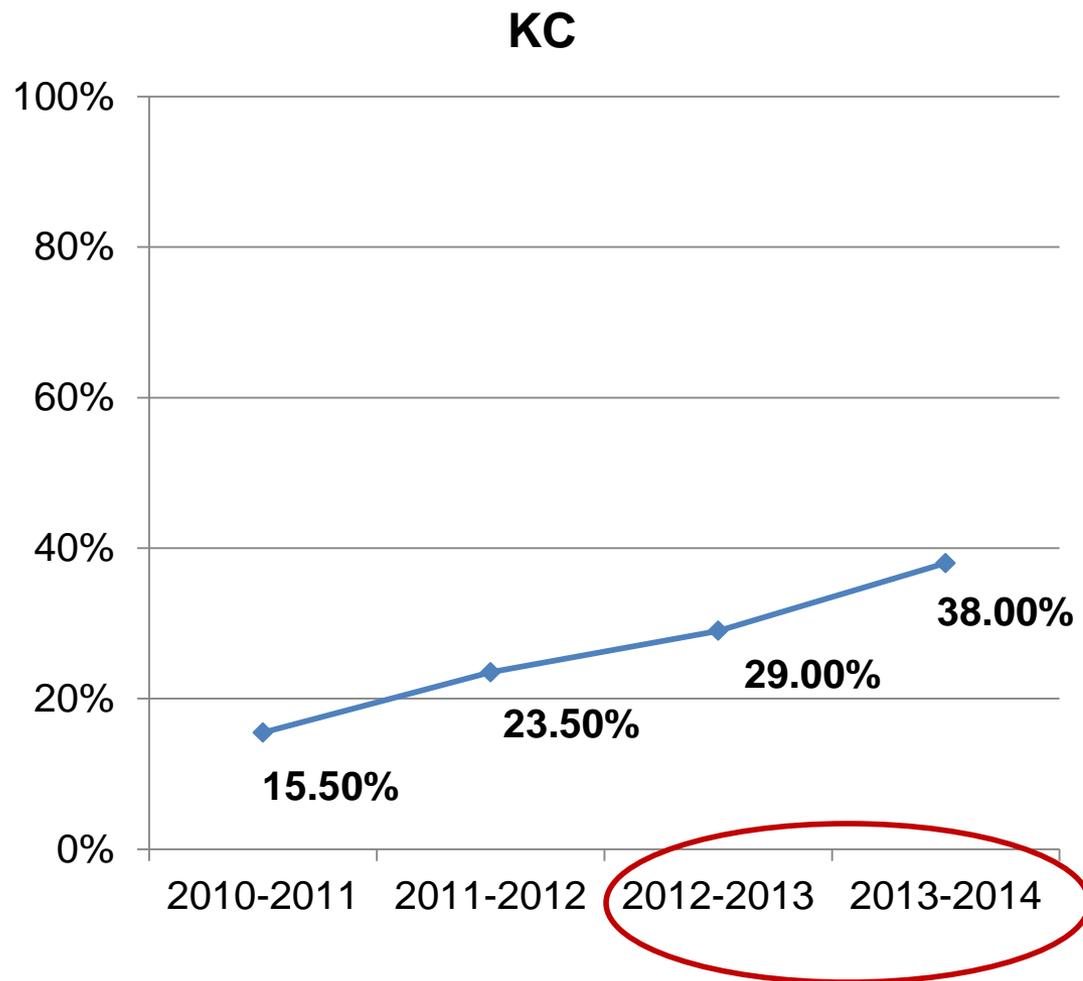
KC & MY (Narratives: Frog Story)

- Subjective ratings by 4 native signers

	Content (15)	Language (15)	Cohesion (15)	Total (45/100%)
TKC	8	10	5.3	23.3 / 52%
TMY	3.5	4	2	9.5 / 21%

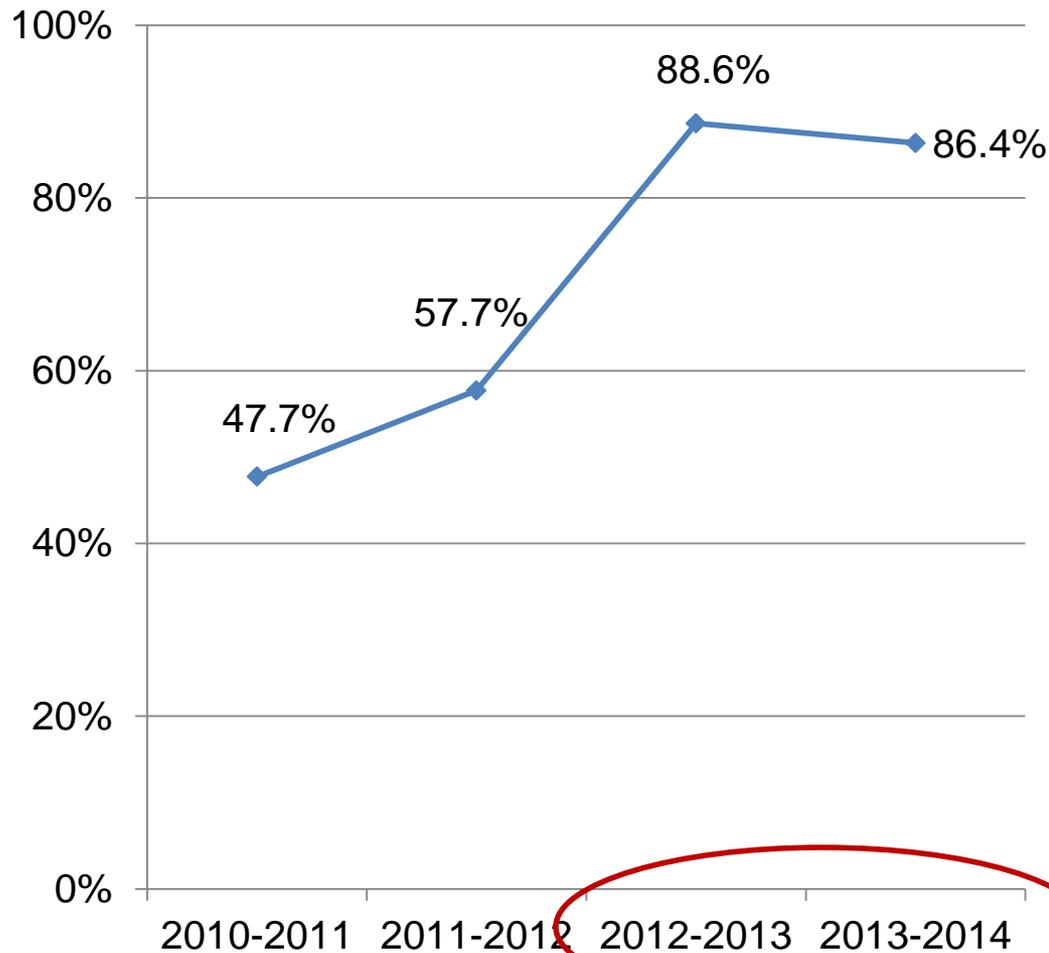
CHINESE LITERACY

Chinese Vocabulary: (PPCLS)

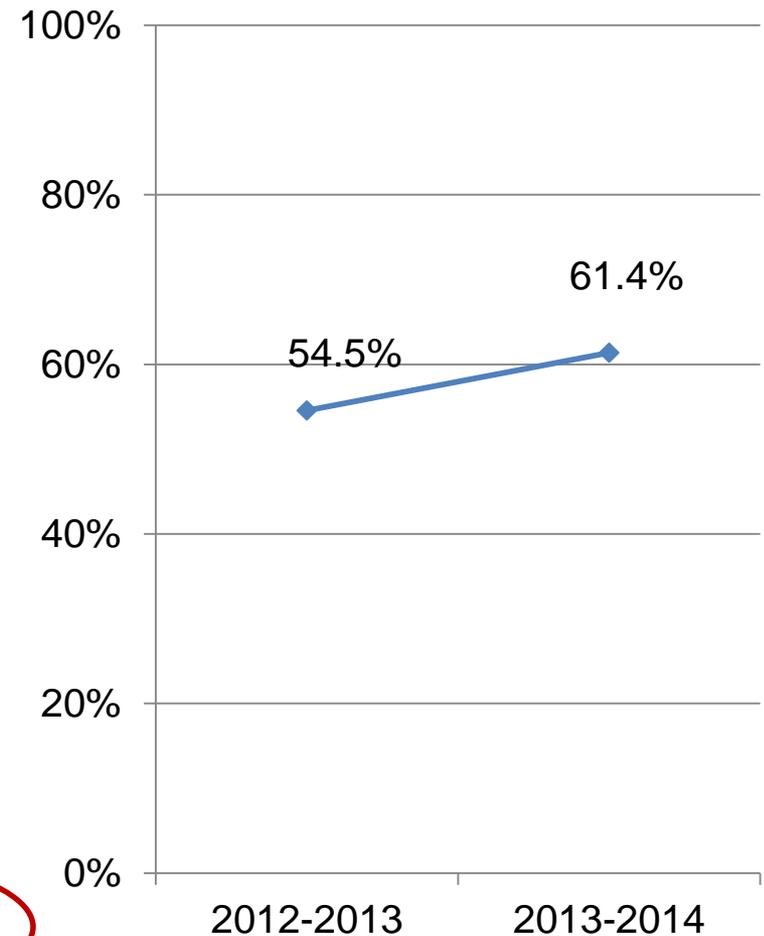


Grammatical Knowledge in Written Chinese (CGA-KG)

KC



MY



SPEECH PERCEPTION

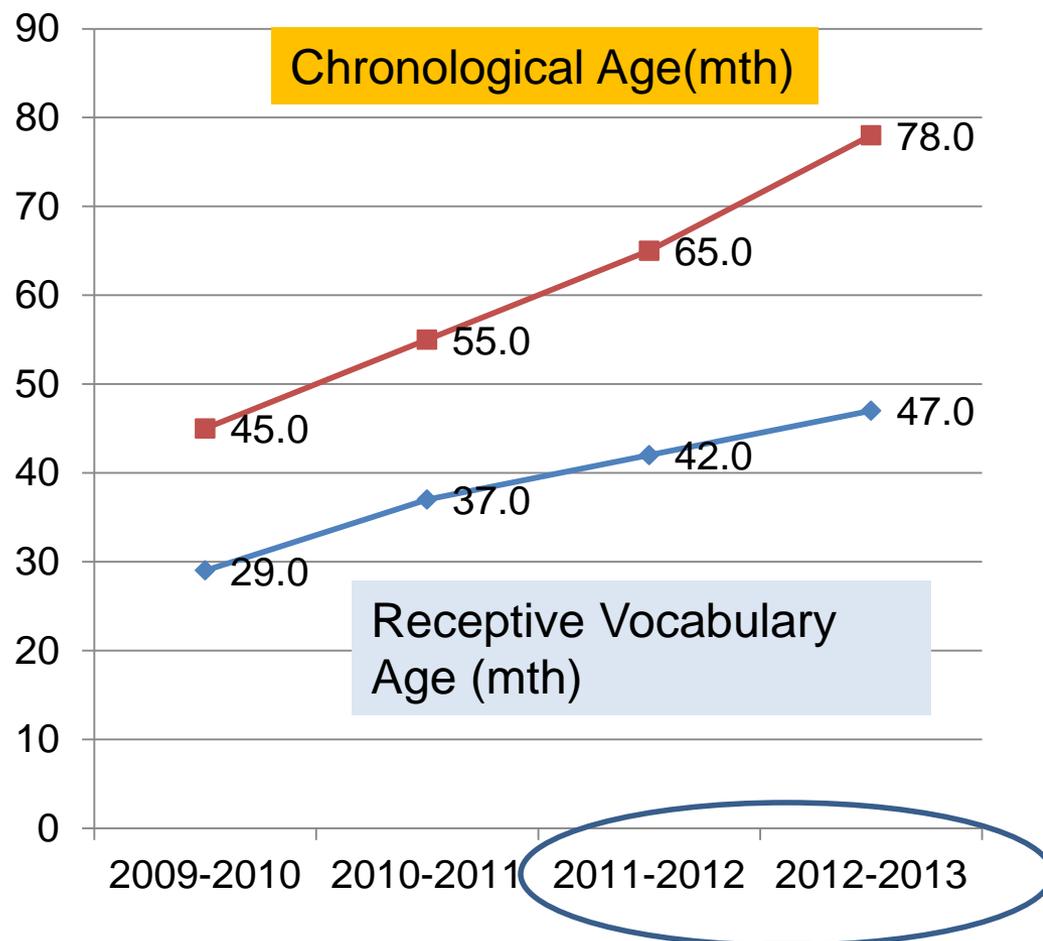
Speech Perception

Test	Year	KC	MY
CBSPT	2009-10	31%	NA
	2011-12	76.2%	NA
	2012-13	83.3%	59.5%

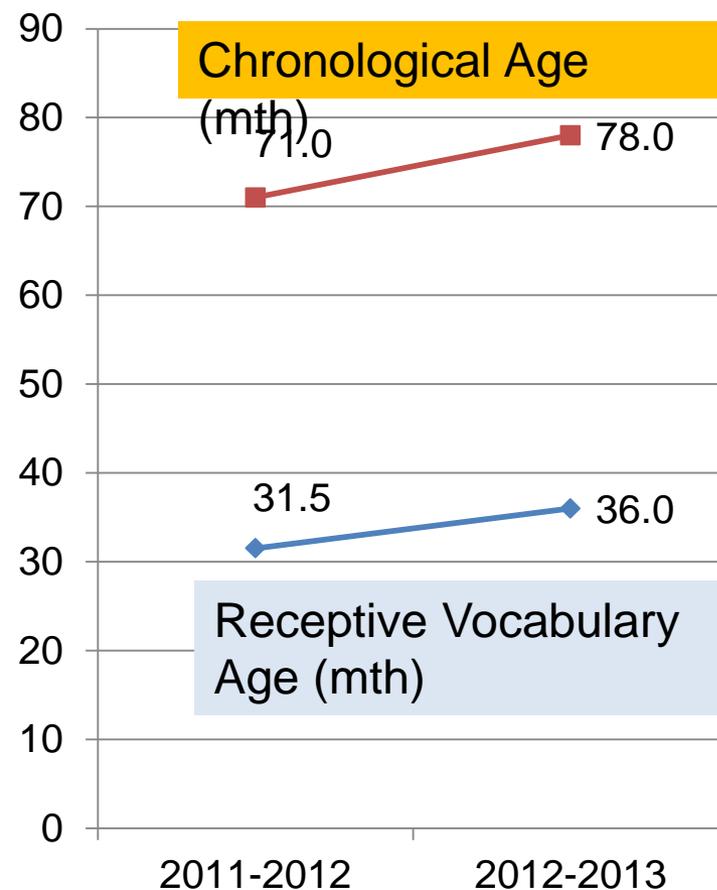
RECEPTIVE VOCABULARY

Receptive Vocabulary (CRVT)

KC



MY



ORAL LANGUAGE

MY (Information provided by Child Assessment Service)

- CA = 3;5 (in 4/2010)

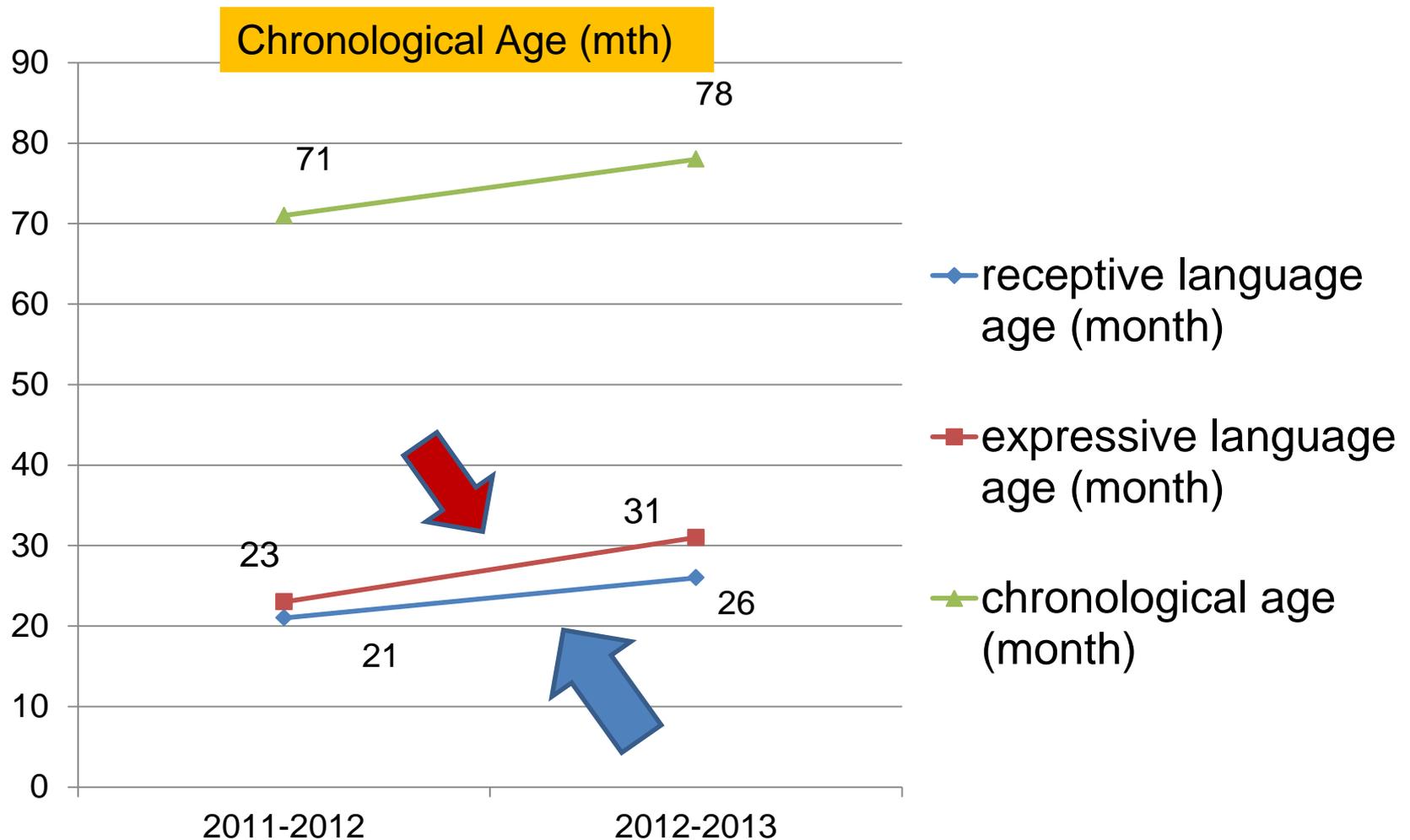
Verbal Comprehension (informal test) = < 12 mth

- Severe delay
- Comprehended mainly by contextual and gestural cues

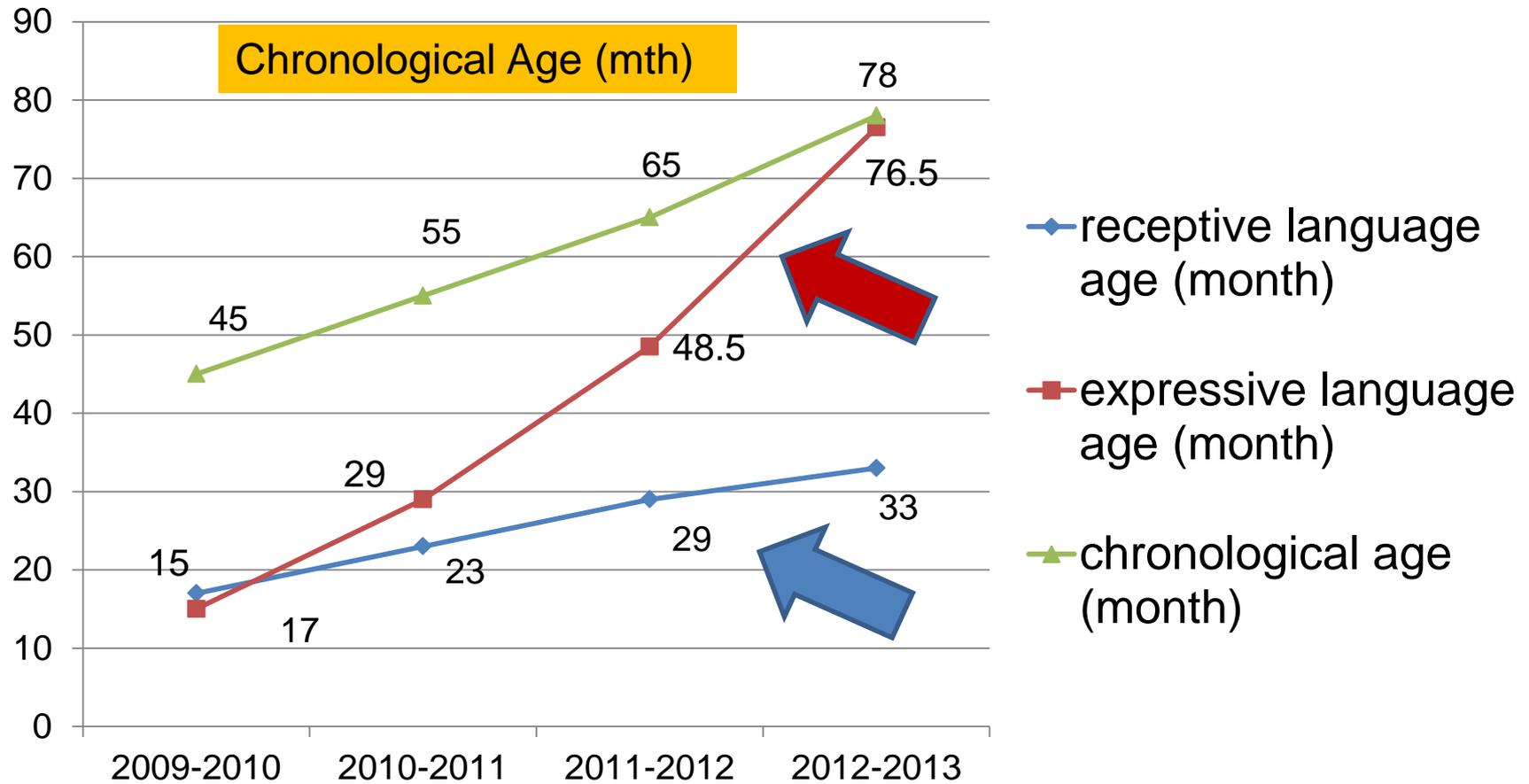
Verbal Expression (informal test) = <12 mth

- Severe delay
- Mainly produced single words & sometimes combined words
- Rare spontaneous speech

MY (Test: RDLS)



KC (Test: RDLS)



DISCUSSION

Signing skills and Literacy

- KC was better in HKSL grammatical knowledge than that of MY especially in the expressive ability
 - early sign language input may help
- KC showed better performance in vocabulary and grammatical knowledge in written Chinese
 - better signed and oral language may help

Oral Language - Receptive (2012-13)

Area of Assessment	KC	MY
Speech Perception	83.3%	59.5%
Receptive Vocabulary	47 mth	36 mth
Receptive Language	33 mth	26 mth

Receptive performance of KC: about 7 mth to 1 year better than that of MY.

Oral Language - Expressive (2012-13)

Area of Assessment	KC	MY
Expressive Language	76.5 mth	31 mth

Expressive performance of KC: 45.5 mth
i.e. nearly 4 year better than that of MY.

Average growth rate: KC (2009-13): 1.83
MY(2012-13): 1.14

Frog Story in Cantonese



Frog Story in Cantonese



Oral Language

Better speech reception scores of KC:

- In terms of language age, KC has ABI surgery received 9 mths earlier than MY; contributing to about 7-12 mths of earlier receptive skills

Advanced speech expression scores of KC:

- Earlier ABI surgery or older language age may not be able to explain the discrepancy
- Early sign language input, hence sign language competence seems having a significant contribution

Observation from parents

- Quite similar observations from parents:

“after learning sign language, he/she was more able to communicate with me, and that helped a lot in my teaching of vocabulary and language concepts to him/her” (Parent of KC)

“once he/she learned the concepts in signed language, it was easier for them to articulate the words in speech and remember the vocabularies” (Parent of MY)

Observation from teacher

- A small study by Shek (2014) by teaching KC and MY 4-character words (idioms) in two different orders in terms of language of instructions:
 - i) oral–sign; ii) sign-oral
- e.g. 車水馬龍 (car-water-horse-dragon)
- Figurative meaning: many carriages or vehicles; heavy traffic; a busy & crowded place

Recognition Task

- 4 choices
- HKSL: presented by a deaf teacher in a video
- Cantonese: presented by a hearing teacher in live voice



Observation from teacher

- KC learned faster and better when signed language was used as medium of instructions
- KC followed better through oral instructions after signed instructions was used (sign-oral better than oral-sign)
- MY showed limited understanding in both ways.

Possible reasons are:

- restricted speech perception and oral language ability;
- Late input and development of signed language.

Conclusion

This preliminary study on deaf children with ABI who study in a sign bilingual and co-enrollment setting brought to our attention that early signed language input does not hinder spoken language development.

It opens up a new paradigm of research that examines whether enhanced signed language input supports the acquisition of spoken language by deaf children under adverse circumstances.

References

- Colletti, V. & Shannon, R. V. (2005). Open Set Speech Perception with Auditory Brainstem Implant? *Laryngoscope*, 115, 1974-1978
- Lee, K. Y. S., (2006). Cantonese Basic Speech Perception Test (CBSPT), Hong Kong: Division of Otorhinolaryngology, Dept. of Surgery, The Chinese University of Hong Kong.
- Lee, K.Y.S., Lee, L.W.T., & Cheung, P.S.P.(1996). Hong Kong Cantonese Receptive Vocabulary Test. Hong Kong: The Hong Kong Society for Child Health and Development.
- Li, H. (1999). Development and Validation of the Preschool and Primary Chinese Literacy Scale. *Psychological Development and Education*, 15(3), 18-24.
- Pallares, N. & Diamante, V. (2011). Auditory brainstem implant in four children with cochlear nerve aplasia. *International Journal of Pediatric Otorhinolaryngology*, 75 (Suppl1), 55.
- Reynell, J. K., 1987, Reynell Developmental Language Scales, Cantonese Edition [based on the 2nd edition of 1977] (Windsor: NFER-Nelson).

THANK YOU!

Chrisyiu_cslds@cuhk.edu.hk