

The oral language development of deaf children in a sign bilingualism and co-enrollment program

Kathy LEE

Department of Otorhinolaryngology, Head & Neck Surgery

Tammy LAU, Emily LAM, Joffee LAM, Gladys TANG & Chris K-M. YIU
Centre for Sign Linguistics and Deaf Studies

香港中文大學醫學院

Faculty of Medicine
The Chinese University of Hong Kong





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:



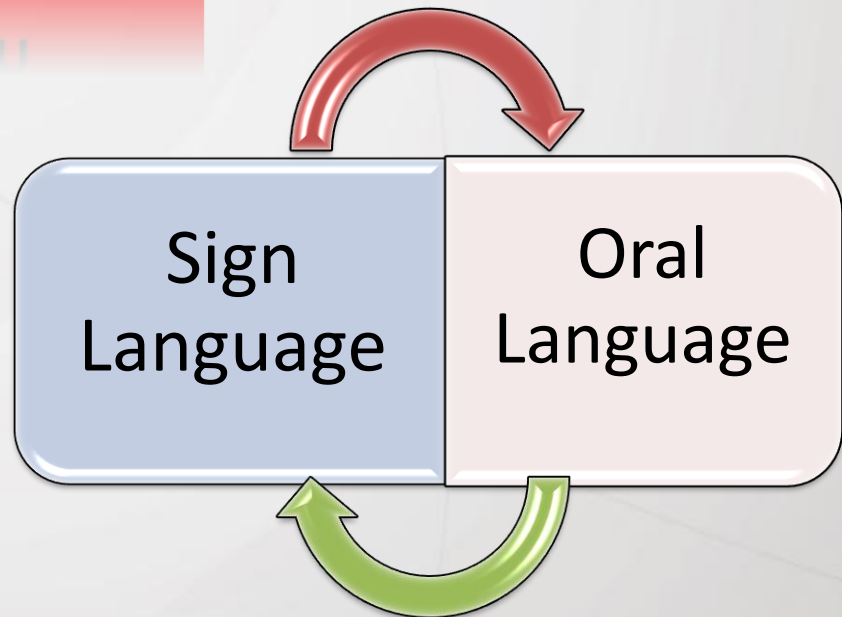
香港賽馬會慈善信託基金
The Hong Kong Jockey Club Charities Trust

Background

Sign Bilingualism

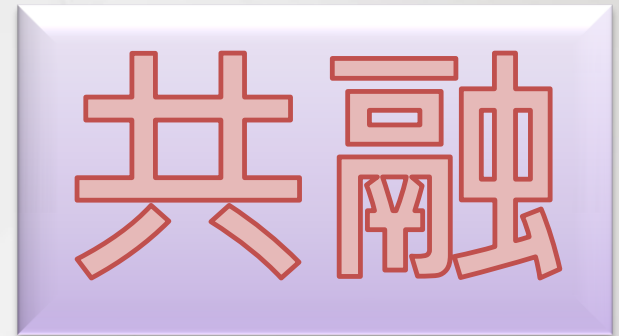
- an approach to the education of deaf children which uses both the sign language of the deaf community and the written/spoken language of the hearing community

Media of instruction



Co-enrollment

- teachers and students
- deaf and hearing co-enroll themselves in the education process



Hearing impairment and Oral Language

- Great individual variations
- Some could catch up with their age peers, many of them still struggle with learning how to speak
 - Geers et al., 2009 (153 children with CI)
 - Age-appropriate receptive language: 47%
 - Age-appropriate expressive language: 39%
 - Inscoe et al., 2009 (45 children with CI)
 - Age-appropriate expressive language: 58%

Oral language & sign language

- little information about the influence of concurrent use of sign and oral language on the children's development of oral language

(Kumar et al, 2009)

Oral language & sign language

Davidson et al., 2013

- 5 CI children, Exposed to sign from birth
- Compared their oral language with a control group
- Comparable scores
- HI children who are exposed to sign language and oral language at a very young age are able to develop sign and oral language at a speed comparable to their age peers

Oral language & sign language

Oral language development in HI children who were exposed to both sign and oral language in school has not been explored

Objective 1

To investigate the oral language development of HI students enrolled in a sign bilingualism and co-enrolment program in Hong Kong

Methodology

Participants

- 14 participants

Mean chronological age		7;6
Gender	Boys	9 (64%)
	Girls	5 (36%)
Hearing loss	Mild (<25 dB)	1 (7%)
	Moderate (26 - 40 dB)	0 (0%)
	Mod-sev (56 – 70 dB)	1 (7%)
	Severe (71 – 90 dB)	3 (21%)
	Profound (> 91 dB)	9 (64%)

Hearing devices	Hearing aids CI	8 (57%) 6 (43%)
Mean age of amplification		1;05
Deaf parents		2 (14%)
School grade	P1 P2 P3	10 (71%) 3 (21%) 1 (7%)

Assessment tools

HK Cantonese Oral Language Assessment Scale (HKCOLAS)

T'sou, B., Lee, T.H.-T., Tung, P., Man, Y., Chan, A., To, C.K.S. *et al.* (2006)

- Cantonese Grammar (CG)
- Textual Comprehension (TC)
- Word Definition (WD)
- Lexical-Semantic Relationship (LS)
- Story retell (SR)
- Expressive Nominal Vocabulary (EV)



HKCOLAS



- Test items were presented via VCD
- Derivation of a composite score for each participants based on the standard scores of 6 sub-tests
 - By the method of Principal Component Analysis

Time point

1 (Baseline)

Data collected 2008-2010

2 (3 year later)

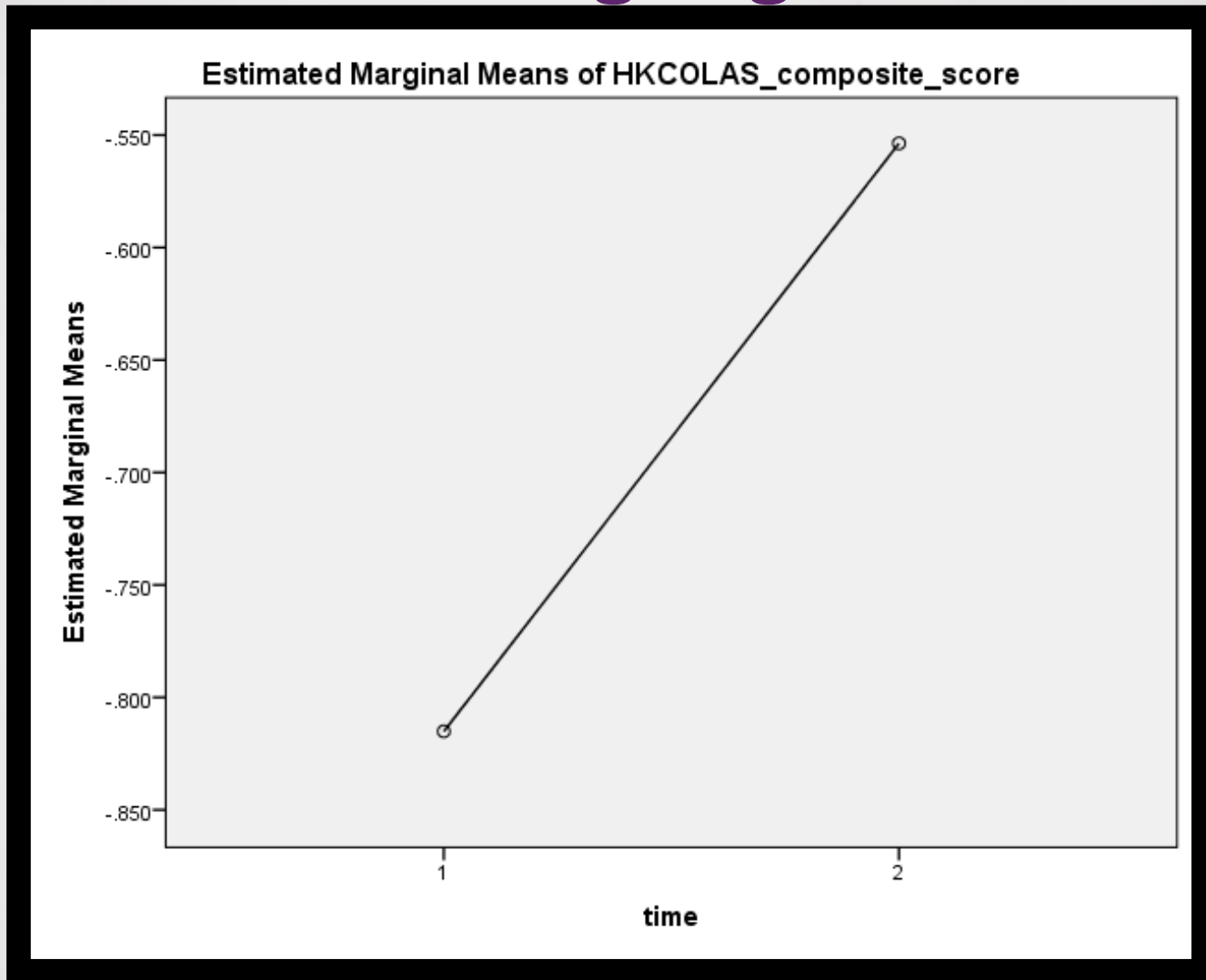
Participants were in P4 to P6

Repeated measures ANOVA on the language scores



RESULTS 1

Overall oral language score over time

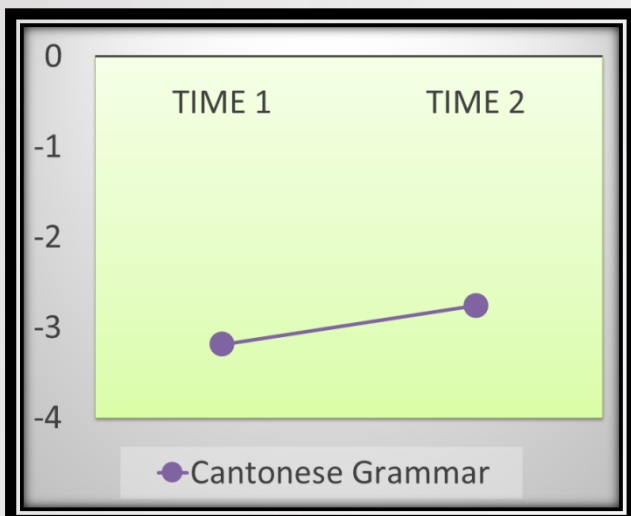


Repeated measures ANOVA ($F = 2.061$, $p = .175$)

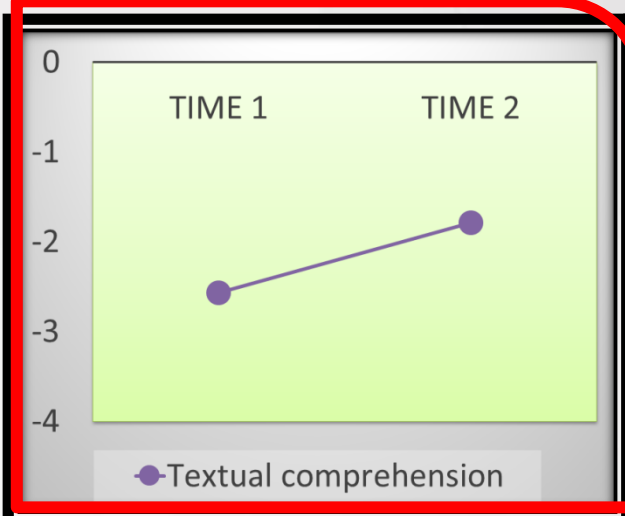
	Baseline	After 3 years	p value
Composite score	-.815	-.554	.175
Cantonese grammar	-3.19	-2.76	.368
Textual comprehension	-2.57	-1.79	.043*
Word definition	-1.51	-1.10	.237
Lexical-semantic relationship	-2.41	-2.04	.174
Story retell	-3.55	-3.05	.223
Expressive nominal vocab	-3.30	-3.51	.580

Repeated measures ANOVA showed significant time effects in TC * $p < 0.05$

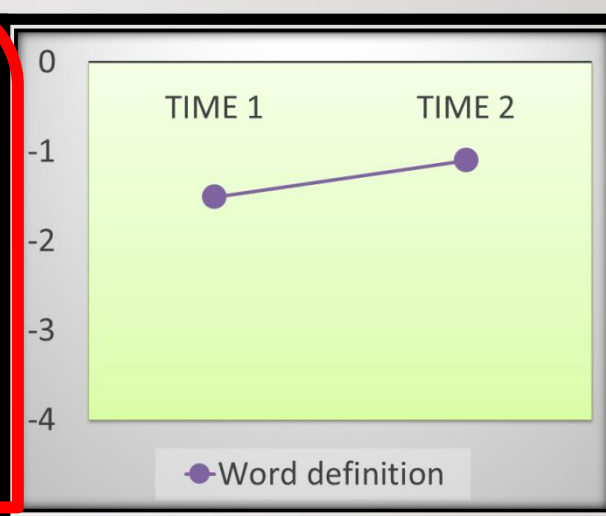
Cantonese Grammar



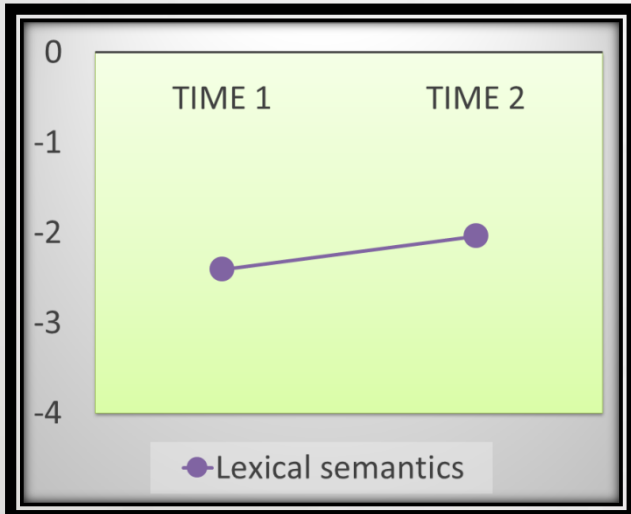
Textual comprehension



Word definition



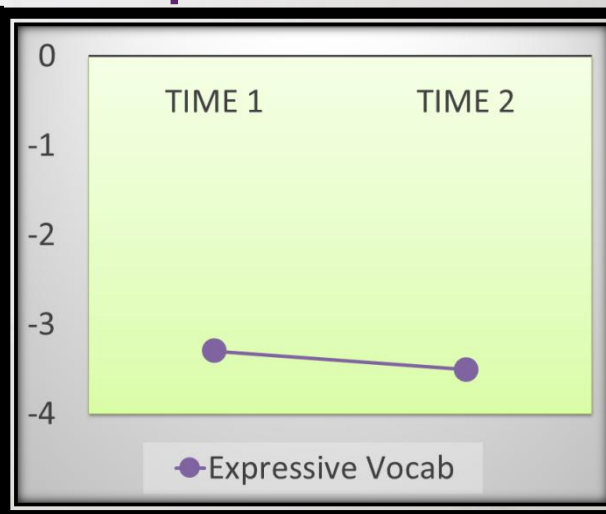
Lexical-semantic Relat



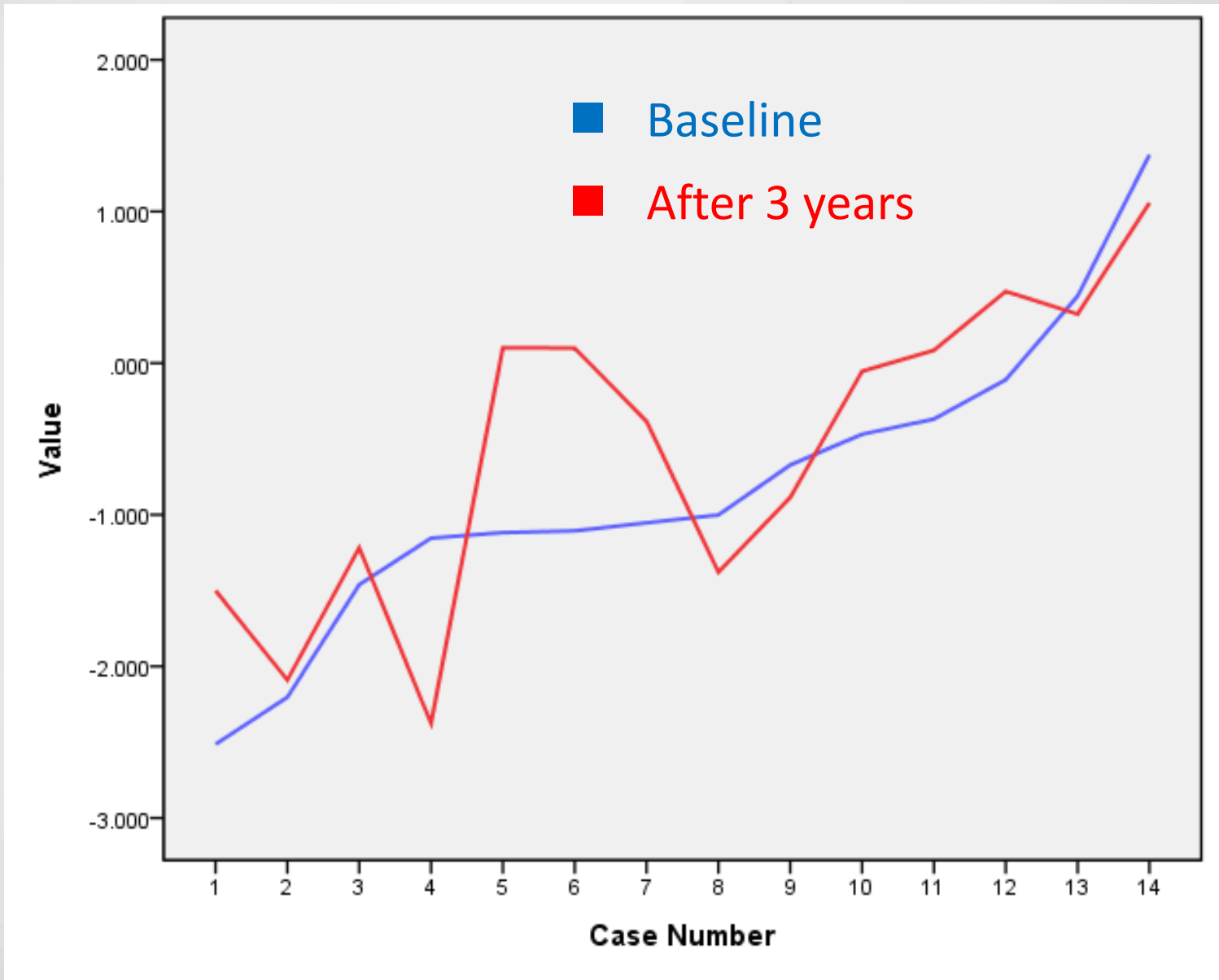
Story retelling



Expressive Vocab



Individual development on oral language



Summary

Students enrolled in a sign bilingualism and co-enrolment program in Hong Kong

- The oral language development of improved in general
 - Improvement noted in 5 out of 6 language subtests
 - Improvement is particular marked in textual comprehension
 - No improvement noted under expressive vocabulary

Objective 2

To compare the oral language development of students enrolled in

- Sign-oral Co-enrolment program
- other mainstreaming schools

Potential student pool

Sign-oral co-enrolment	Mainstreaming
40	97



How to find comparable students ???

Challenge



Students characteristics

- Great individual variations, different baselines
- Assumption:
 - children with different initial language skills might develop at different rates
- Grouping of children based on one's initial oral language performance using the statistical cluster analysis

Groupings

Group 1	Group 2
27	28

Pearson Chi-Square (df 1) = 9.103, p = .004

Student groups

	Group 1	Group 2
Mainstreaming	25	16
Sign-oral	2	12

- An imbalance of sample size in Group 1 (2 vs 25)
- Compare students on group 2

Pearson Chi-Square (df 1) = 9.103, p = .003*

Baseline language scores

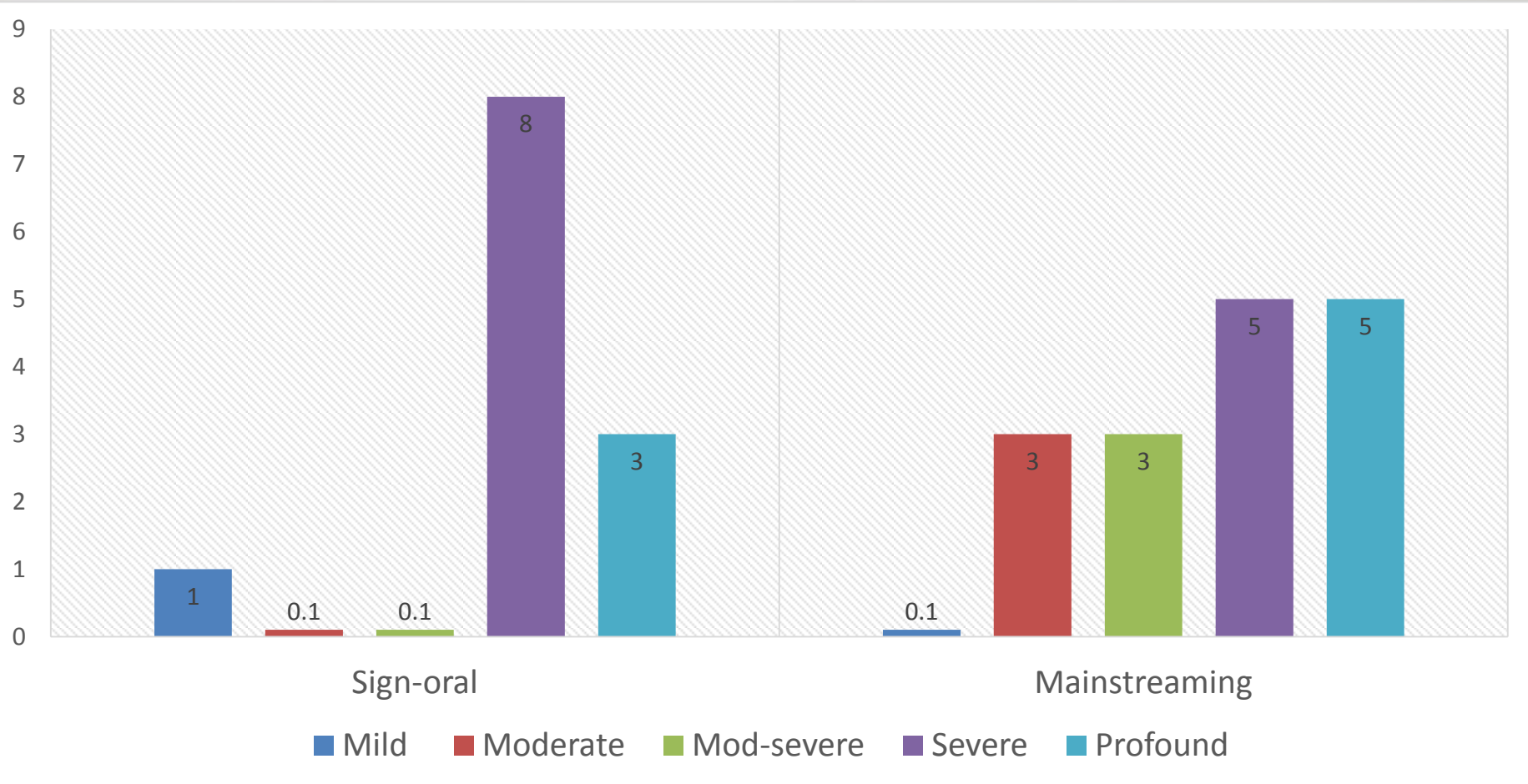


	Sign-oral	Mainstreaming
Composite COLAS scores	-1.102	-0.660

Independent t-test ($t = 1.910, p = .067$)

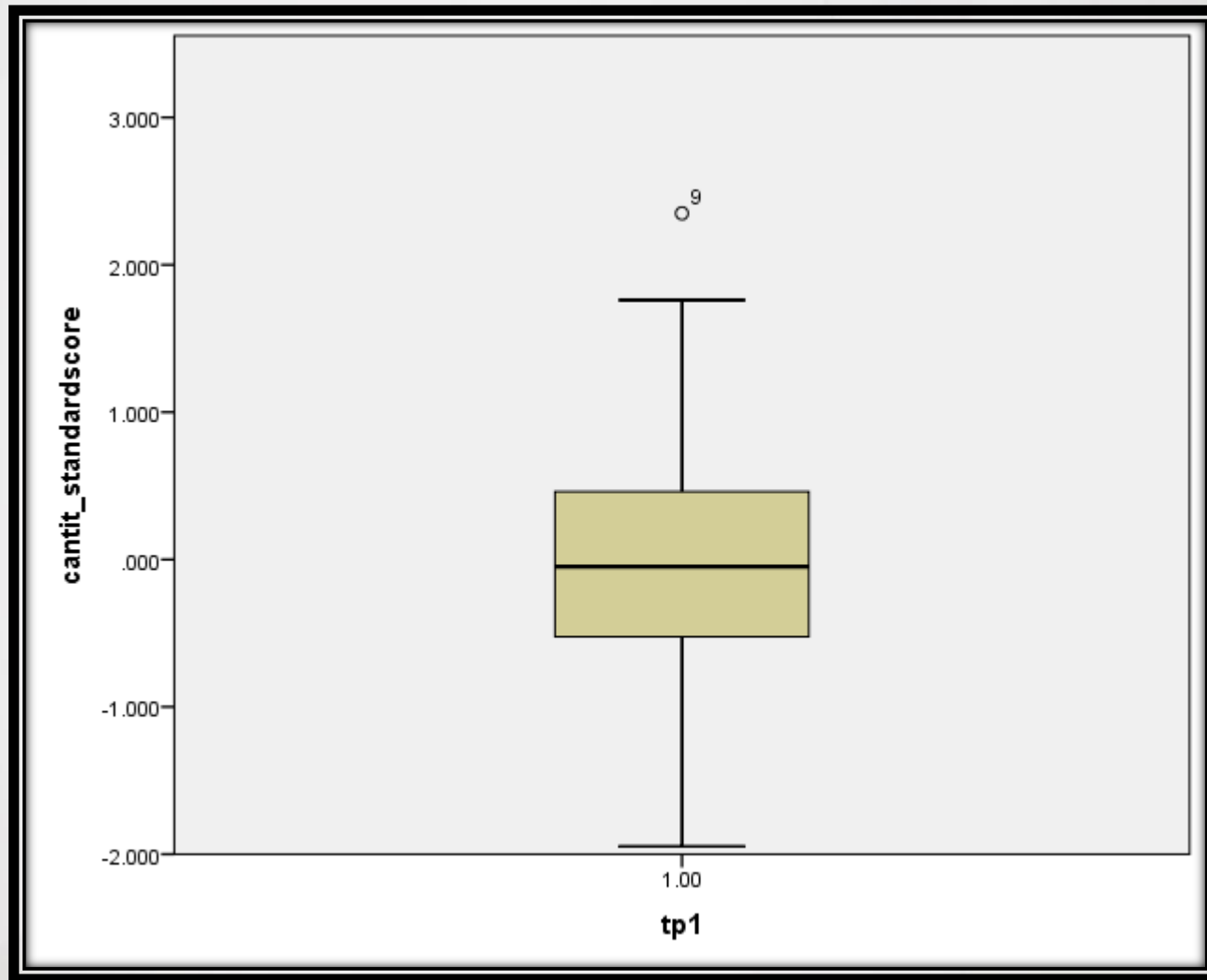
Degree of hearing loss

	Sign-oral	Mainstream
Mild	1 (8%)	0
Moderate	0	3 (19%)
Mod-sev	0	3 (19%)
Severe	8 (67%)	5 (31%)
Profound	3 (25%)	5 (31%)

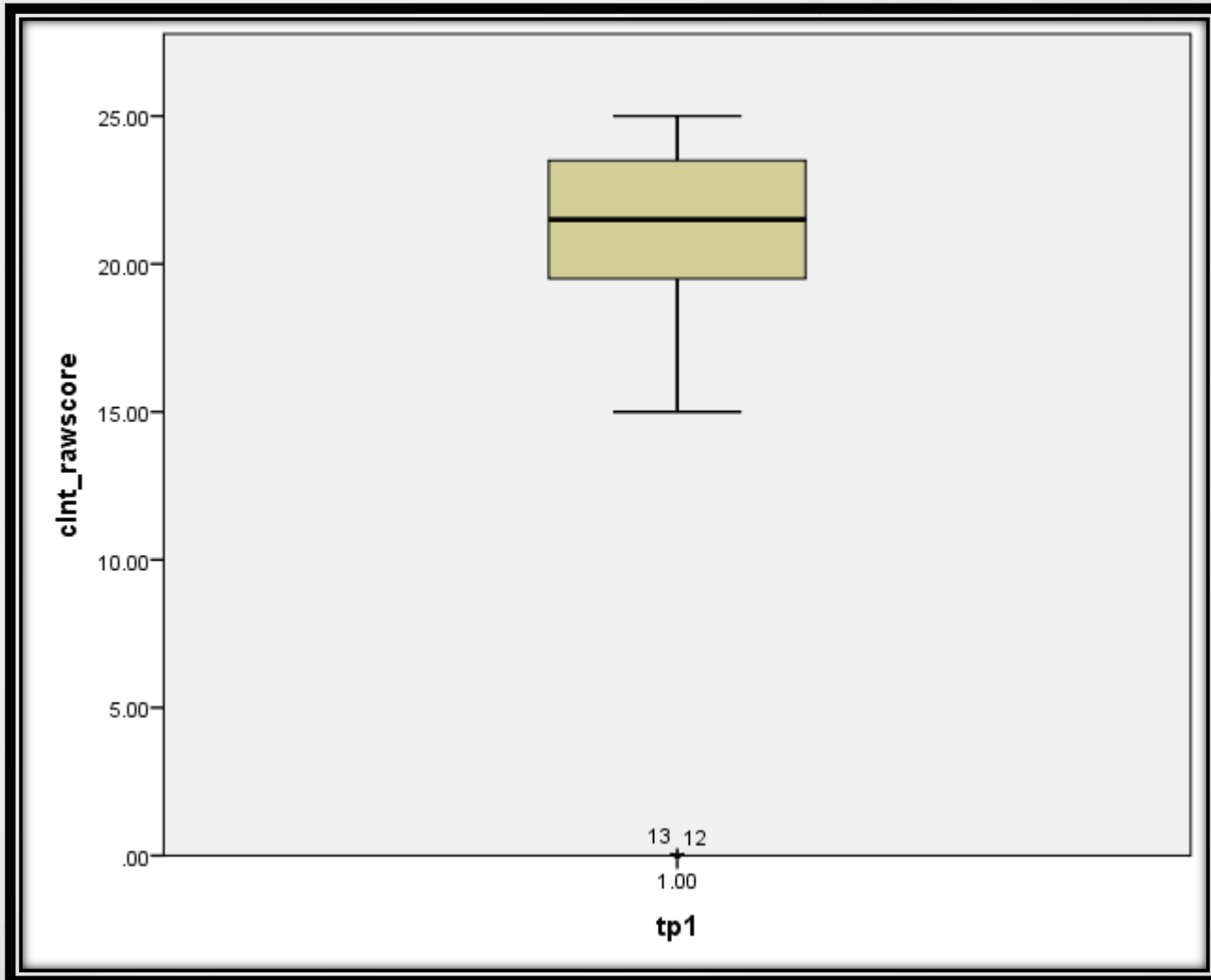


- Mainstream had more students with mild to Mod-Severe HL
- Sign-oral had more severe to profound HL

Speech perception: Tone identification



Speech perception: Word recognition



Repeated measures ANCOVA on the language scores
Controlled variables of hearing level and speech perception

Time point

1 (Baseline)

Data collected 2008-2010

2 (3 year later)

Participants were in P3 to P6



RESULTS 2

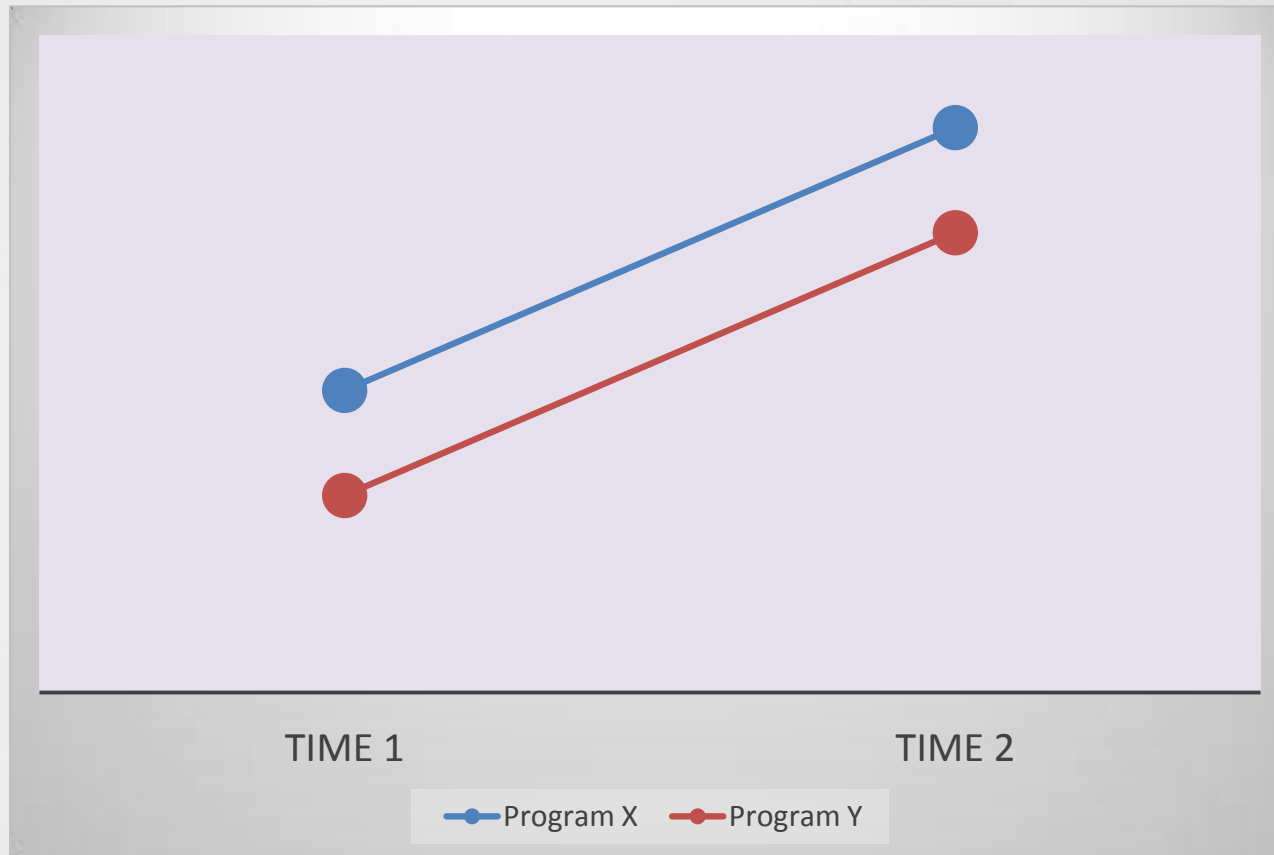
Are there interaction effects between

Type of program

Time

**after controlling hearing level,
speech perception ability**

Interpretation – no interaction effect



- Progressing at the similar rate
- The two programs have similar effect on changes of scores

Interpretation – Interaction effect

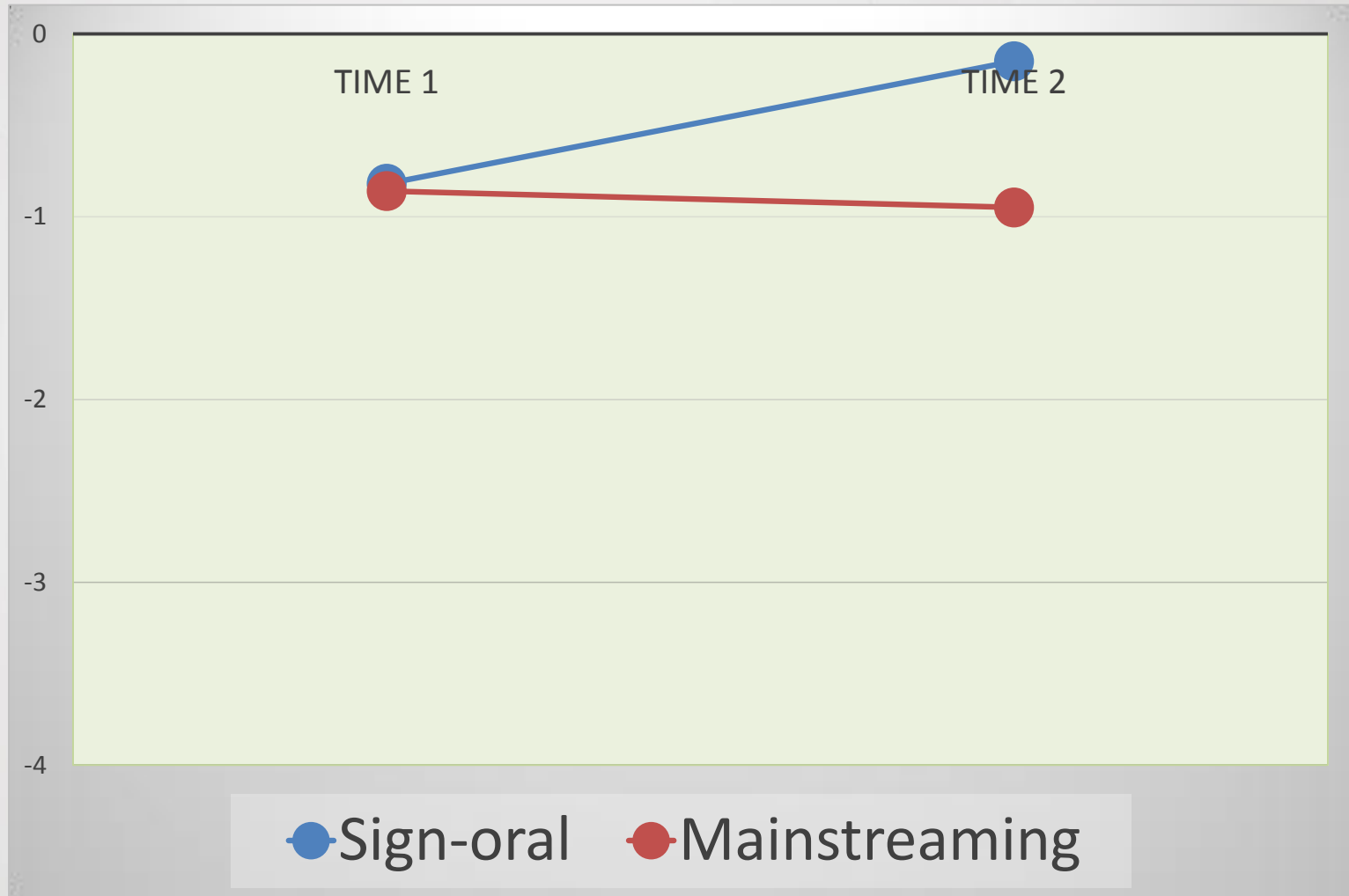


- Progressing at different rate
- One program achieves a greater rate of change in score than the other one

		Sign-oral	Mainstreaming	p value
Cantonese grammar	Time 1	-3.33	-3.78	.011*
	Time 2	-1.80	-3.85	
Textual comprehension	Time 1	-2.62	-2.60	.011*
	Time 2	-1.11	-2.43	
Word definition	Time 1	-1.54	-1.68	.312
	Time 2	-0.89	-1.66	
Lexical-semantic	Time 1	-2.41	-2.34	.017*
	Time 2	-1.50	-2.75	
Story retell	Time 1	-3.36	-3.74	.020*
	Time 2	-2.27	-4.14	
Expressive nominal vocab	Time 1	-3.32	-2.87	.459
	Time 2	-2.83	-2.95	
Composite score	Time 1	-0.82	-0.86	.007*
	Time 2	-0.15	-0.95	

Repeated measures ANCOVA showed significant program*time effects in CG, TC, LS, SR & composite score with $p < 0.05$

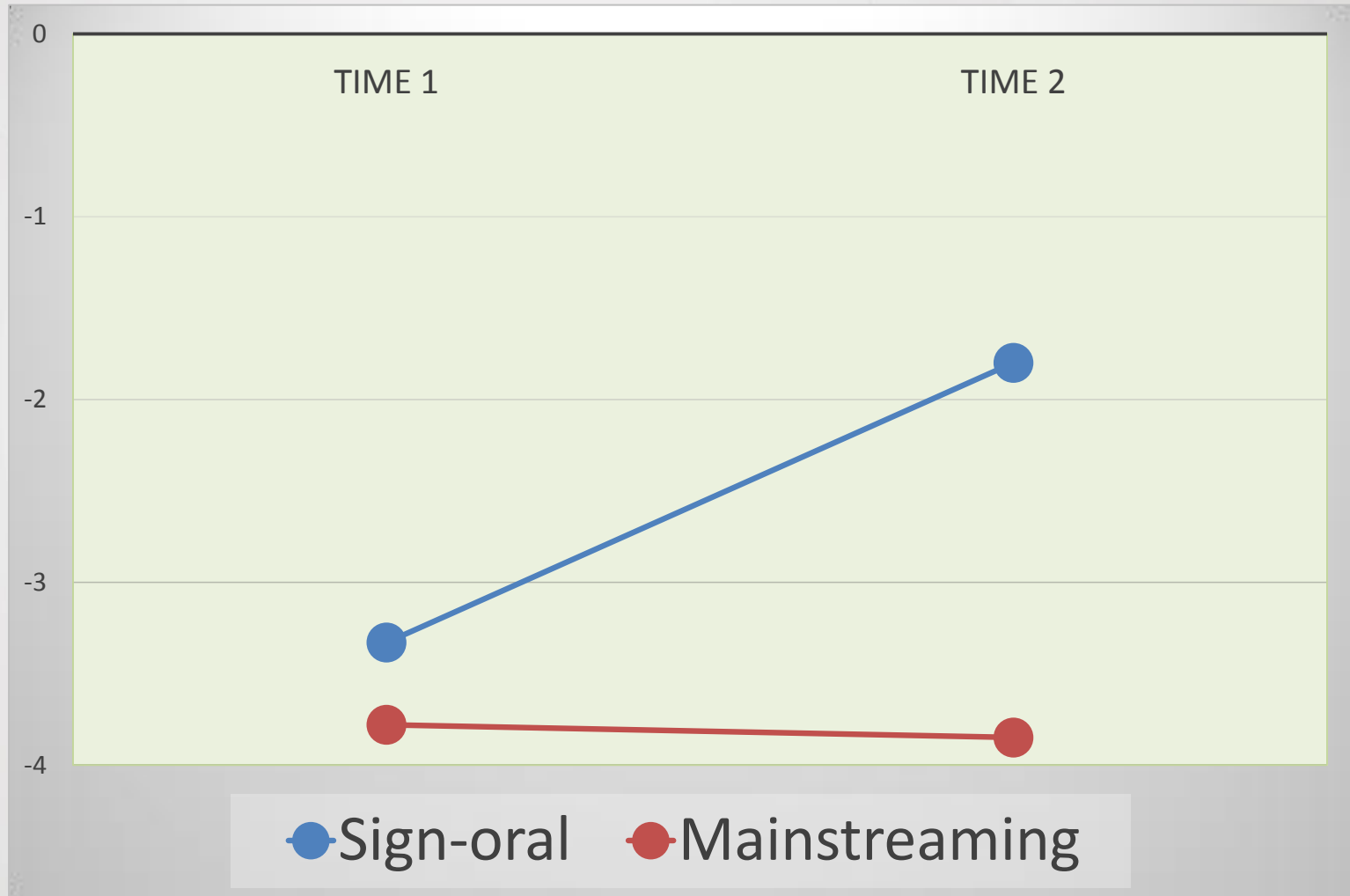
Overall language



Textual comprehension



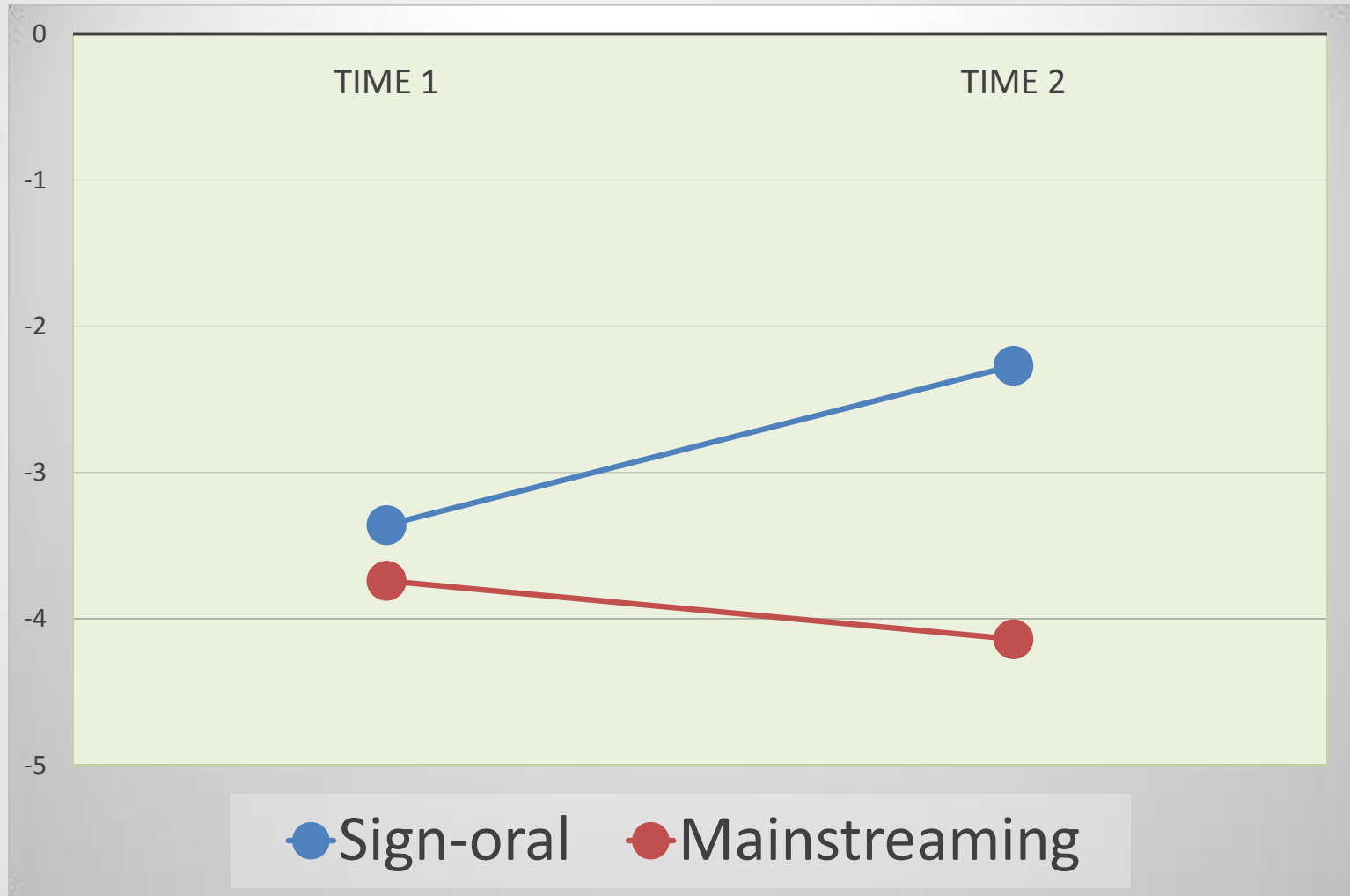
Cantonese Grammar



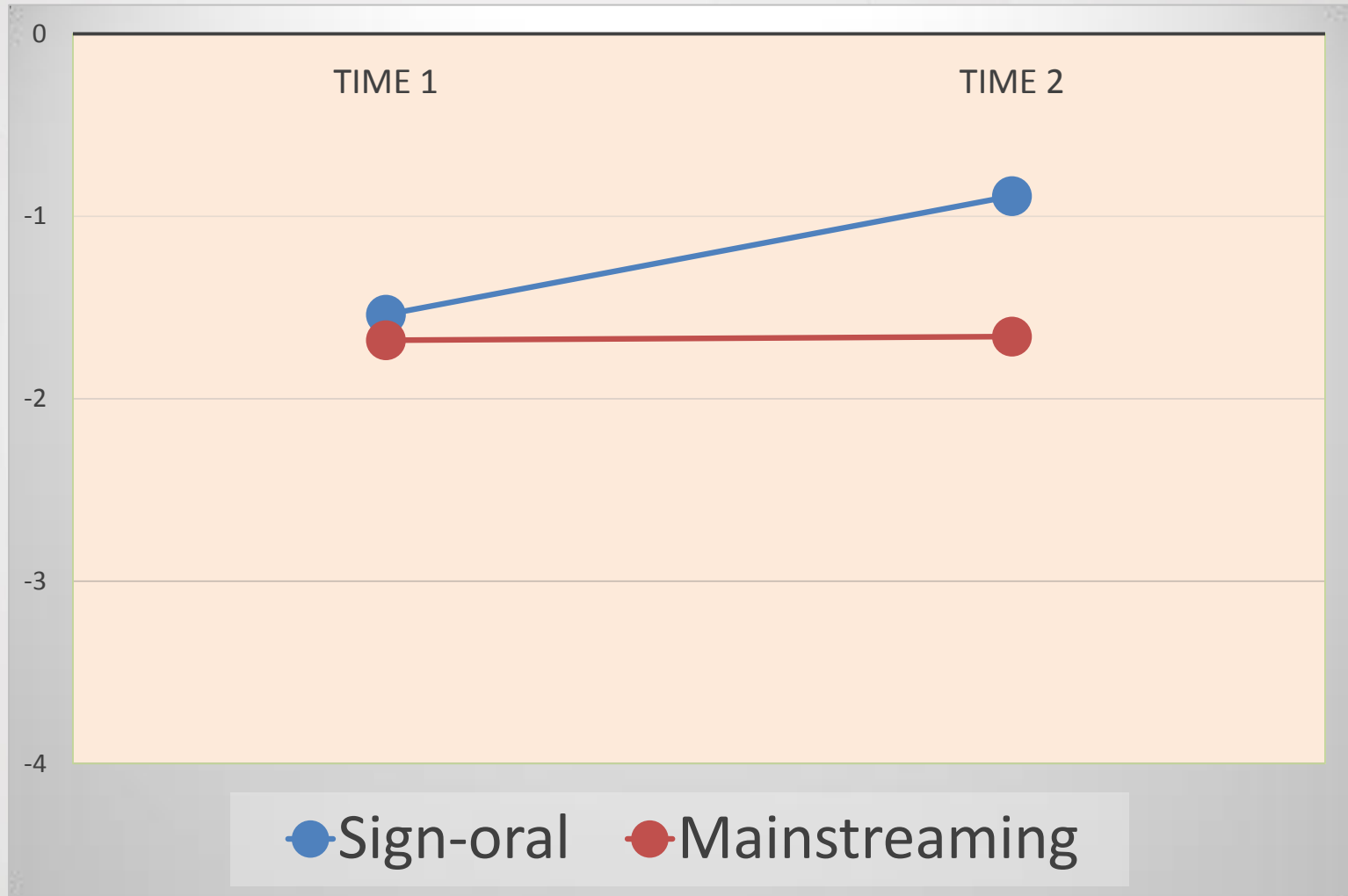
Lexical-semantic



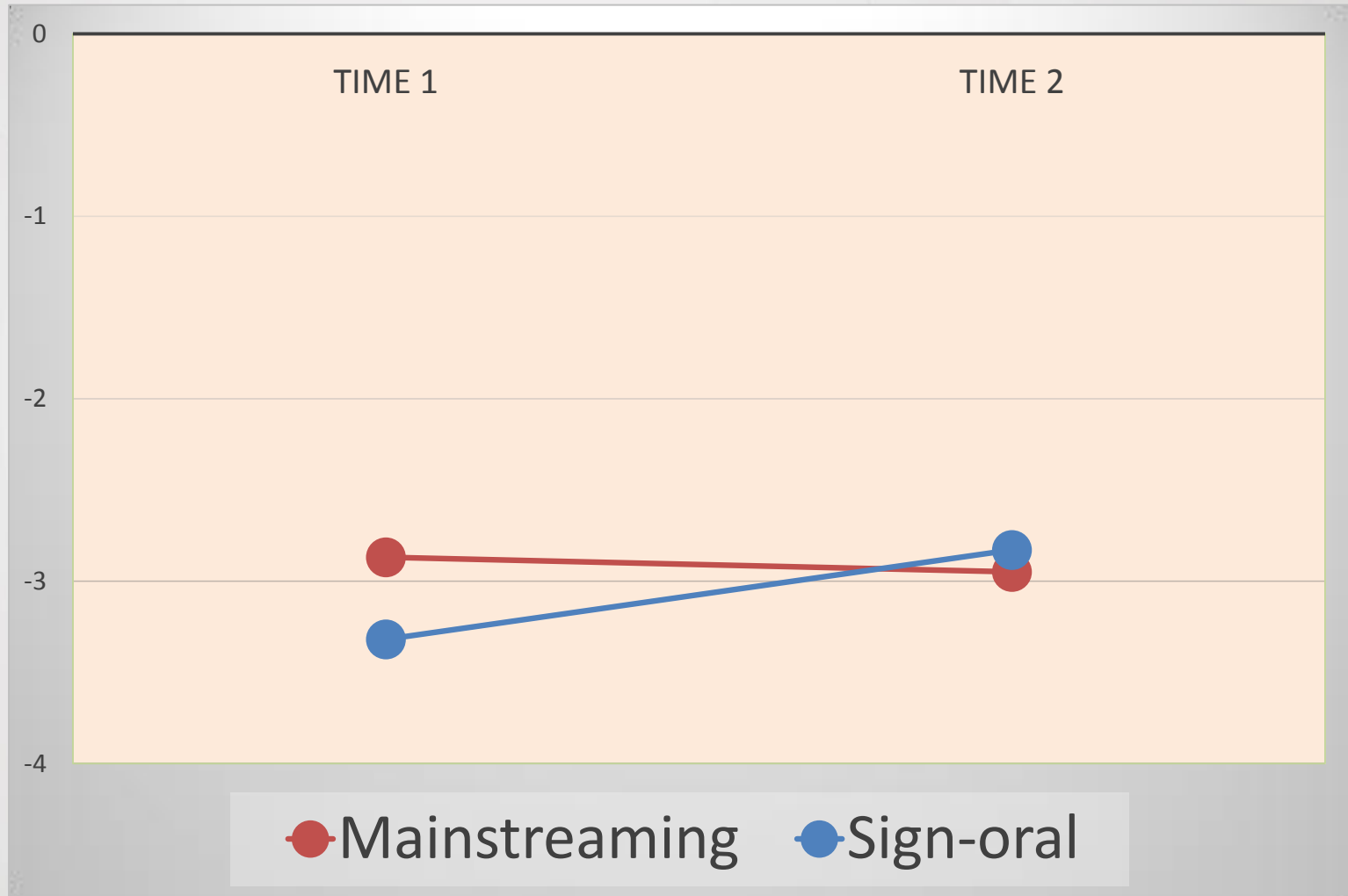
Story Retelling



Word definition



Expressive Vocabulary



Summary

- Aligned students in terms of
 - initial oral language abilities
- Controlled
 - Degree of hearing loss
 - Speech perception ability

Summary

- Sign-oral Co-enrolment students made a faster rate of development than the Mainstreaming students in
 - The overall language performance
 - 5 subtests
 - Cantonese grammar
 - textual comprehension
 - lexical-semantic relationship
 - story retell

Summary

- No significant difference in improvement between two groups in
 - word definition
 - expressive nominal vocabulary
- Exposure to sign language in the SLCO group does not hinder students from improving in oral language



Thank you



香港中文大學
The Chinese University of Hong Kong

© Faculty of Medicine The Chinese University of Hong Kong