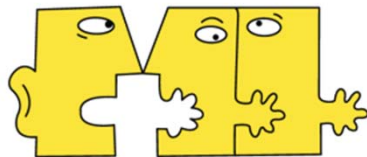


Assessment of Chinese Grammatical Knowledge for D/hh children: Current findings and implications

Qun Li, Gladys Tang, Karen Cheung, Jia Li,
Chris Yiu, Scholastica Lam, David Lam



香港中文大學
THE CHINESE UNIVERSITY OF HONG KONG



手語及聾人研究中心
Centre for Sign Linguistics and Deaf Studies

Grammatical Knowledge in the assessment

- A set of internalized informational structures related to the theoretical model of grammar;
- Embody two highly related components:
 - **Grammatical form:** linguistic forms on the subsentential, sentential and suprasentential levels;
 - **Grammatical meaning:** the literal meaning expressed by sounds, words, phrases and sentences, where the meaning of an utterance is derived from its component parts or the ways in which these parts are ordered in syntactic structure, and the meaning associated with the propositional intention;

(Purpura, 2004)

Language assessment

- Achievement information
 - Determine the degree to which children have mastered;
 - Determine whether a child is progressing in line with expectations;
- Diagnostic information
 - Identify language impairments or language deficits;
 - Identify areas of specific strength and weakness;

→ Provide valuable information to educators, speech therapists (ST), and students themselves;

(Purpura, 2004; Mueller Gathercole et al., 2013)

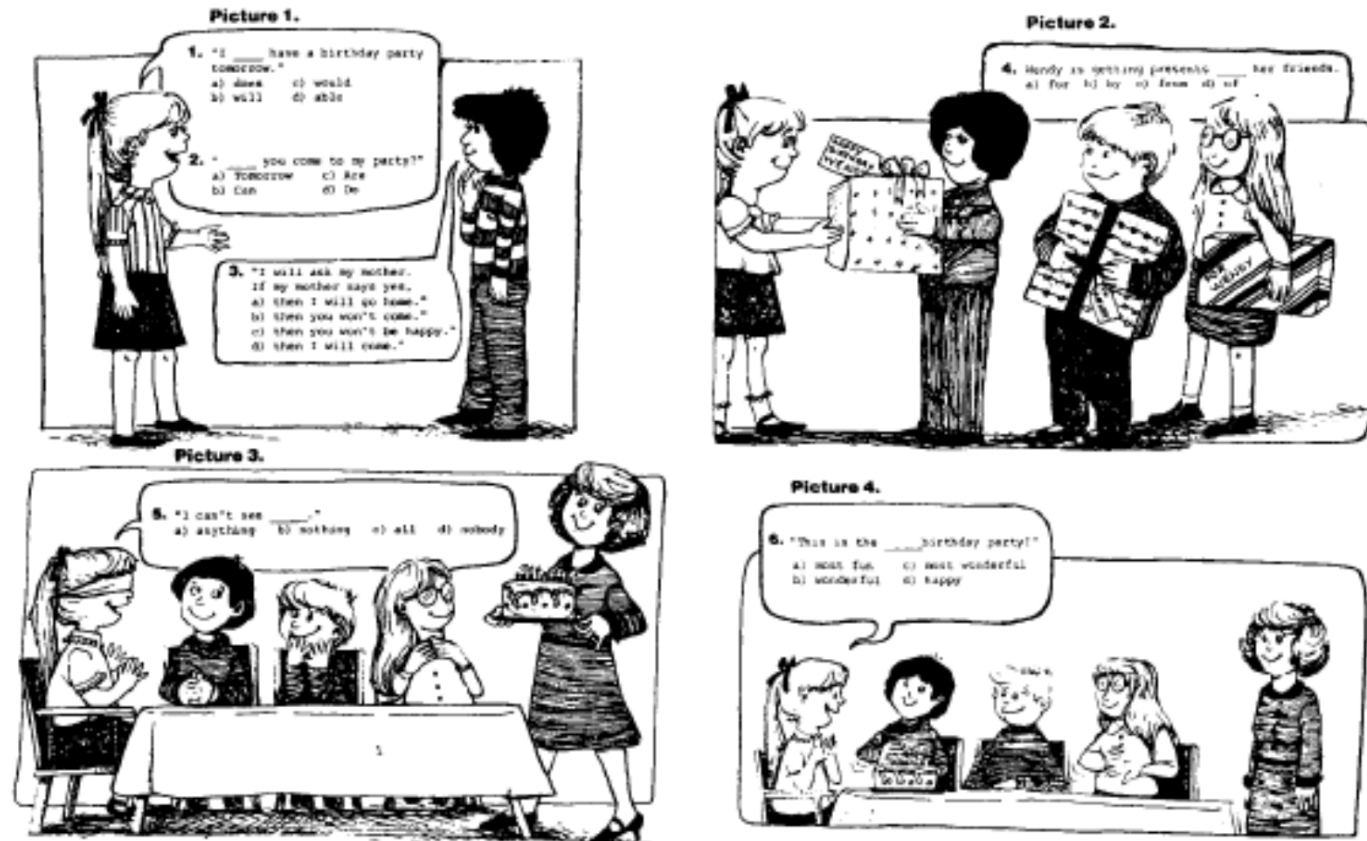
REVIEW: LANGUAGE ASSESSMENT FOR D/HH LEARNERS

Test of Syntactic Abilities (Quigley et al., 1978)

The TSA employed sentence completion and correction formats to assess deaf learners' comprehension and production of certain English syntactic structures:

- Negation: *with 'be, do, have, modal'*
- Conjunction: *conjunction, deletion*
- Question formation: *wh-question, yes/no question, tag question*
- Pronominalization: *personal pronouns, backward, possessive adjectives, possessive pronouns, reflexivization*
- Verbs: *verb auxiliaries, tense sequencing*
- Complementation: *infinitives & gerunds*
- Relativization: *embedding, relative pronoun referents*
- Disjunction & Alternation

Wilbur et al. (1983)



Wilbur et al. (1983)

Structures tested (not tested in TSA):

- Why-questions
- Conditionals: *if, then*
- Nonlocative prepositions: *about, by, for*
- Indefinite pronouns: *some(thing), any(one), no(body)*
- Quantifiers: *each, every, some, all*
- Modal verbs: *can, should, may*
- Elliptical constructions
- Reciprocal pronouns: *each other*
- Comparative constructions: *than, like, as...as*

RTAS (Berent, 1988)

- Phrasal structures:
 - Prepositional phrases (e.g. 'Lay the clothes down on the bed')
 - Prenominal adjectives (e.g. 'Bill lost his books')
 - Adverbs (e.g. 'They usually meet on Monday')
- Clausal structures:
 - Adverbial clauses (e.g. 'I will cry if you hit me')
 - Infinitive clauses (e.g. 'It is hard for me to write letters')
 - Noun clauses (e.g. 'We think that she will go away')
 - Gerund clauses (e.g. 'She was accused of stealing it')
 - Relative clauses (e.g. 'I called a man who might visit us')
 - Participial clauses (e.g. 'I found a lesson clearly explaining the grammar')

Interim Summary

- Delayed Language development:
 - Most of the structures were not well established even among the 18-year-old deaf students, whereas all of the structures had been mastered by the 10-year-old hearing children (Quigley et al., 1978);
 - Reflect better performance of higher reading levels;
 - BUT even the upper reading levels, their performance did not reflect full mastery yet (Wilbur et al., 1983; Berent, 1988);
- Identify the overall degree of syntactic difficulty for deaf students (i.e. the difficulty of verb systems, relativization, functional categories);



CHINESE ASSESSMENT FOR D/HH STUDENTS ???

The developing tool:

Assessment of Chinese Grammatical Knowledge (ACGK)



Task: Word Reordering

(火车排排看)



Structures tested in Word Reordering task

Ba-constructions

例：妈妈把门推开了。

Bei-constructions

例：窗户被小美打开了。

Double Object Constructions

例：老师送小明一本书。

Locative Existential Sentences

例：墙上挂着几幅画。

Modals

例：小明会游泳。

Negation

例：小明昨天没有完成作业。

Questions

例：谁走出教室？

Task: Picture Selection

(图片选选看)

小豬在踢抱着小狗的小熊。



姓名: demo01
班号: demoPresent

下一頁

Structures tested in Picture Selection task

Binding (reflexive & pronoun)

例: 小美的奶奶帮自己戴帽子。

Comparative sentences

例: 西瓜比苹果大。

Control Sentences

例: 老师要小明认真学习。

Prepositions

例: 青蛙向河里跳去。

Relative clauses (SSi & SOi)

例: 抱着小狗的小猫在睡觉。

Task: Picture-Sentence Matching

(小狮子说得对吗?)



Structures tested in Picture-Sentence Match

Aspect markers
(progressive & perfective)

例：小明在踢足球。

Ba-constructions

例：小猫把小狗咬了。

Bei-constructions

例：小猫被小狗咬了。

Quantifiers (all / some /every)

例：所有学生都参加了比赛。

Task: Fill-in-Blank

(选词填充大作战)



Structures tested in Fill-in-Blank task

Auxiliaries (de/di/dei)

例：妈妈笑得很开心。

Negation (bu & meiyou)

例：小明昨天没有完成作业。

Prepositions

(dui/gen/cong/xiang/zai)

例：青蛙站在石头上跳来跳去。

Questions (wh-words)

例：今天谁没有来学校？

15 grammatical structures

Structures	Word Reordering	Picture Selection	Picture-Sentence Matching	Fill-in-Blank
Aspect makers			√	
Ba-constructions	√		√	
Bei-constructions	√		√	
Binding		√		
Comparative sentences		√		
Control sentences		√		
Double object constructions	√			
Locative existential sentences	√			
Modals	√			
Auxiliaries				√
Negation	√			√
Prepositions		√		√
Quantifiers		√		
Questions	√			√
Relative clauses			√	

On-line

Group assessment & individual assessment



System feedback

[view all tests](#)

About Test: demoWR

testID	demoWR
test name	火車排排看
test type	wordReordering
using style	wordReordering.css
number of questions	3
submitted papers	Completed: 10/12
testing classes	demoPresent

[view Questions](#)

Total: 12



Click to view
individual test
paper

Papers

paperID	studentName	hearingStatus	classID	IP	startTime	usedTime	score	and
02280	jc-slco / demo01	Hearing	demoPresent	137.189.85.178	2011-02-15 16:46:35	00:04:43	03/3	3
02286	jc-slco / demo02	Hearing	demoPresent	137.189.85.178	2011-02-15 17:15:39	00:00:25	02/3	3
02290	jc-slco / demo01	Hearing	demoPresent	137.189.85.75	2011-02-16 09:23:18	00:00:27	03/3	3
02294	jc-slco / demo02	Hearing	demoPresent	137.189.85.75	2011-02-16 09:45:07	00:00:26	03/3	3
02301	jc-slco / demo01	Hearing	demoPresent	137.189.85.75	2011-02-16 12:06:17	00:00:25	03/3	3
02302	jc-slco / demo02	Hearing	demoPresent	137.189.85.75	2011-02-16 12:06:19	00:00:26	02/3	3
02306	jc-slco / demo20	Hearing	demoPresent	137.189.85.75	2011-02-16 12:11:14	00:00:36	03/3	3
02310	jc-slco / demo01	Hearing	demoPresent	137.189.85.75	2011-02-16 12:48:06	00:00:21	03/3	3
02315	jc-slco / demo03	Hearing	demoPresent	137.189.85.75	2011-02-16 15:06:53	00:01:09	03/3	3
02319	jc-slco / demo04	Hearing	demoPresent	137.189.85.75	2011-02-16 15:17:33	00:00:21	03/3	3
02323	jc-slco / demo06	Hearing	demoPresent	137.189.85.75	2011-02-16 15:30:22	Not Completed	N/A/3	2
02376	jc-slco / demo01	Hearing	demoPresent	137.189.85.75	2011-03-04 16:35:27	Not Completed	N/A/3	2

[\[Logout\]](#)

System feedback

About Test: demoWR

testID	demoWR
test name	火車排排看
test type	wordReordering
using style	wordReordering.css
number of questions	3
submitted papers	Completed: 10/12
testing classes	demoPresent


[view Questions](#) | [view Papers](#)

About Paper: 02302

paperID	02302
student	jc-sico / demo02
class when test	demoPresent
startTime	2011-02-16 12:06:19
usedTime	00:00:26
score	2/3



Answer & RT
for each item are
available

Q.	Question Img	Structure	Answers Subcat	Answer	time
1		questions	wh-adjunct	為甚麼不見了手錶？ 	used 11 seconds 2011-02-16 12:06:21 12:06:32
2		morphemeDistinction	dei	哥哥小心地過馬路。 	used 7 seconds 2011-02-16 12:06:32 12:06:39
3		questions	wh-adjunct	你為甚麼傷心？ 	used 6 seconds 2011-02-16 12:06:39 12:06:45

[\[Logout\]](#)

Study in HK

- 2010 to date
- Sign Bilingual and Co-enrolment Programme (SLCO)
 - D/hh students
 - Hearing students
- In 2012 & 2013: non-SLCO Hearing students
 - No. of participants: 1535 in total



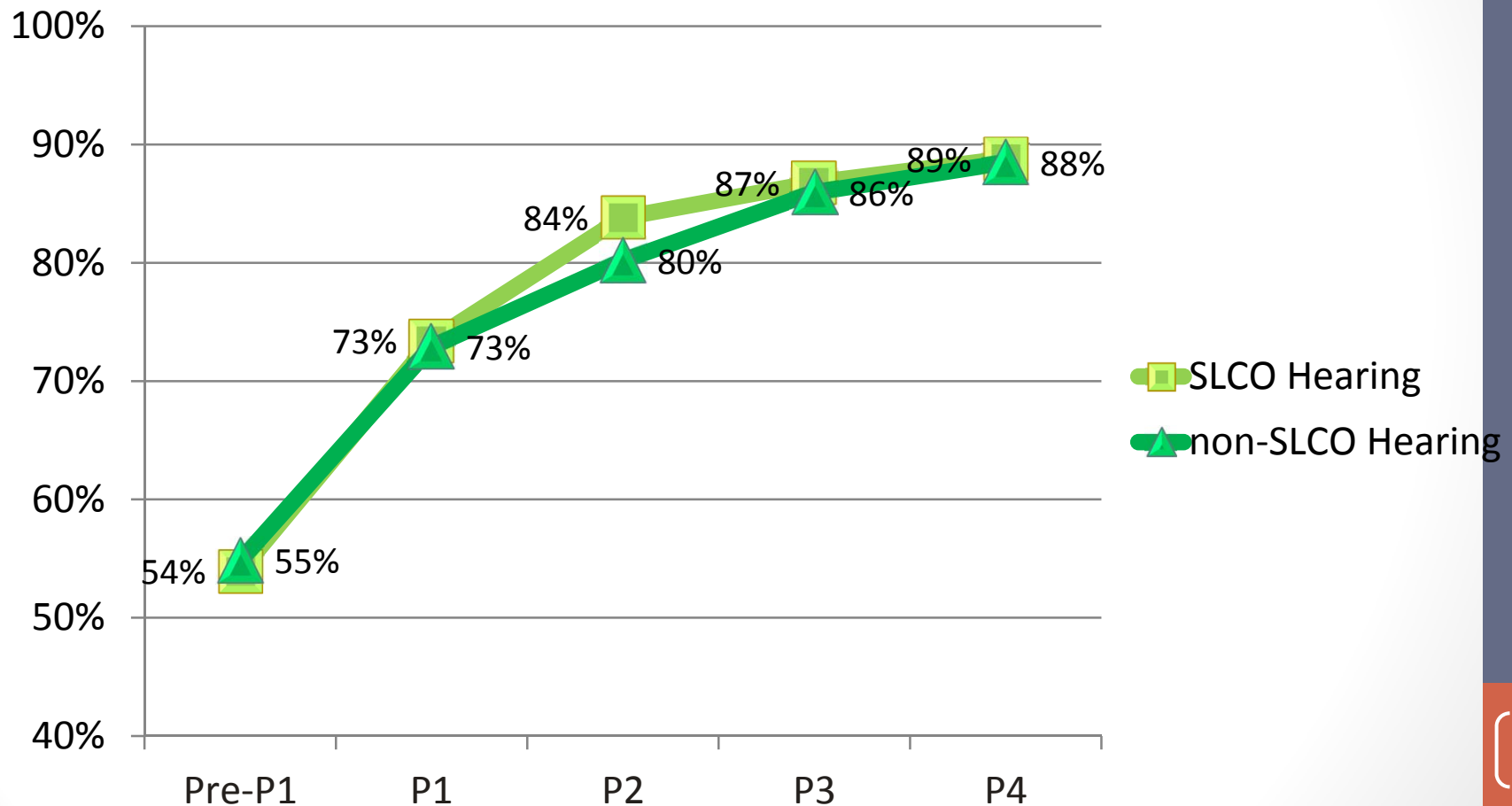
賽馬會手語雙語共融教育計劃
JOCKEY CLUB SIGN BILINGUALISM AND
CO-ENROLMENT IN DEAF EDUCATION PROGRAMME

SLCO D/hh and SLCO Hearing students

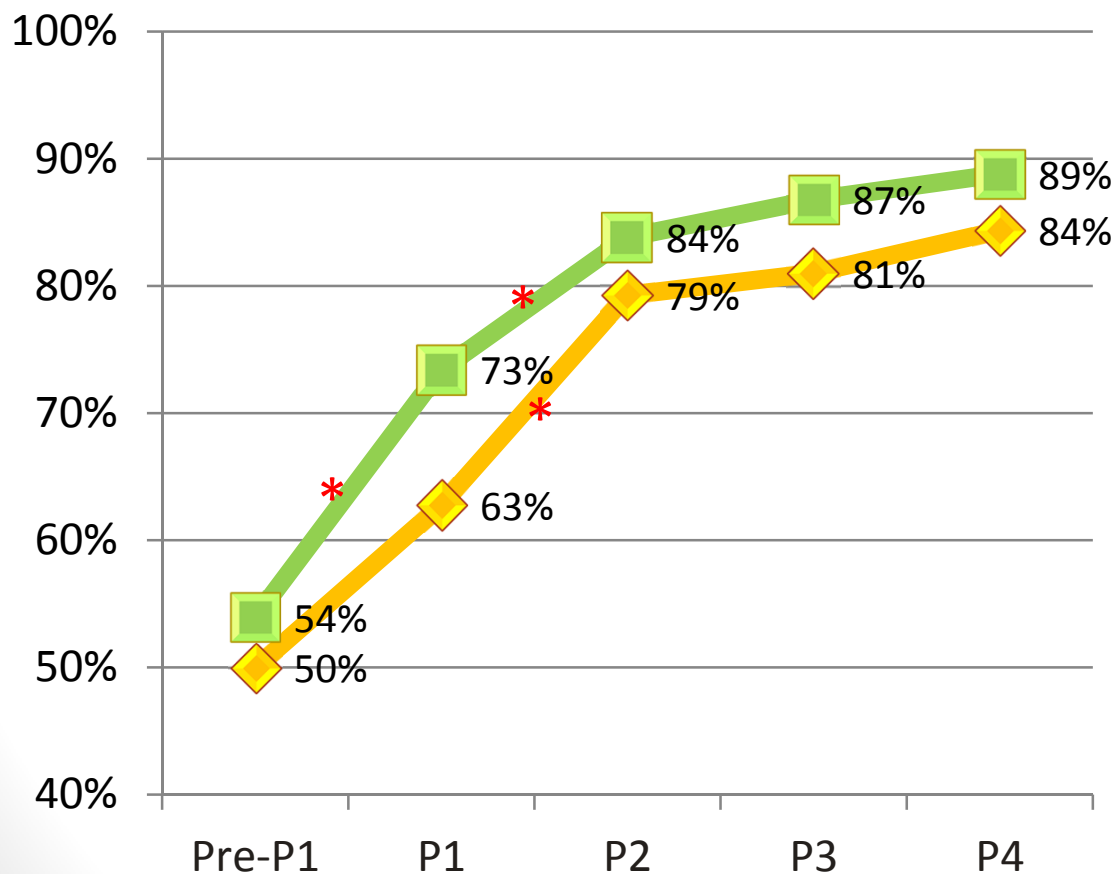
Levels	Hearing status	No. of participants
Pre-P1	D/hh	11
	Hearing	51
P1	D/hh	14
	Hearing	80
P2	D/hh	15
	Hearing	70
P3	D/hh	16
	Hearing	85
P4	D/hh	18
	Hearing	90

- Accumulative data!
- D/hh students
 - Hearing loss:
 - Moderately severe (15%);
 - Severe;
 - Profound;
 - Except hearing loss,
NO other problems reported;

Overall performance of hearing students from Pre-P1 to P4 (SLCO vs. non-SLCO)



Overall performance of SLCO students from Pre-P1 to P4



SLCO D/hh (between-groups)

($F(4, 69) = 21.249, p = .000^{**}$)

Post Hoc:

- Pre-P1 vs. P1: $p = .055$
- P1 vs. P2: $p = .000^{**}$
- P2 vs. P3: $p = .993$
- P3 vs. P4: $p = .912$

◆ SLCO D/hh

■ SLCO Hearing

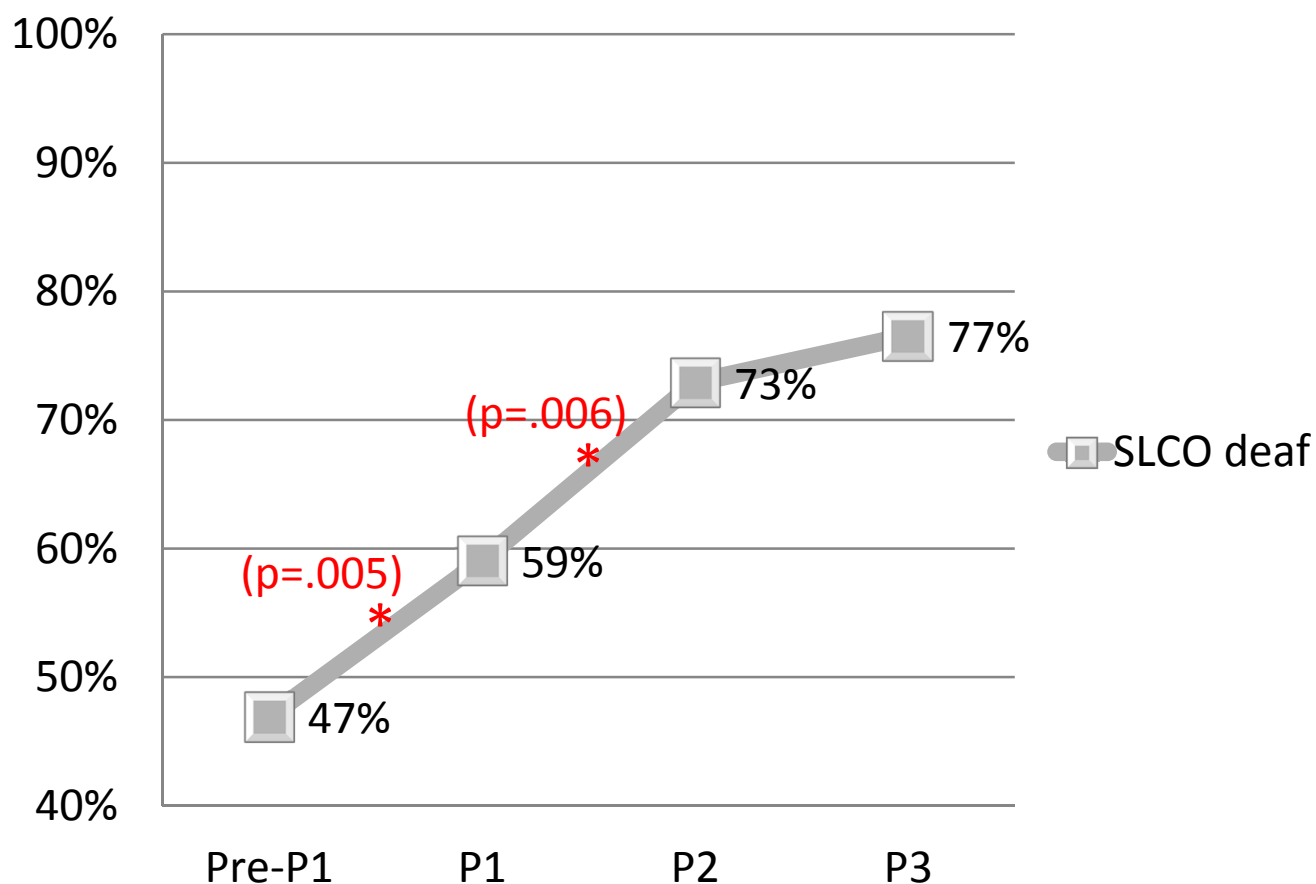
SLCO Hearing (between-groups)

($F(4, 371) = 100.853, p = .000^{**}$)

Post Hoc:

- Pre-P1 vs. P1: $p = .000^{**}$
- P1 vs. P2: $p = .000^{**}$
- P2 vs. P3: $p = .468$
- P3 vs. P4: $p = .751$

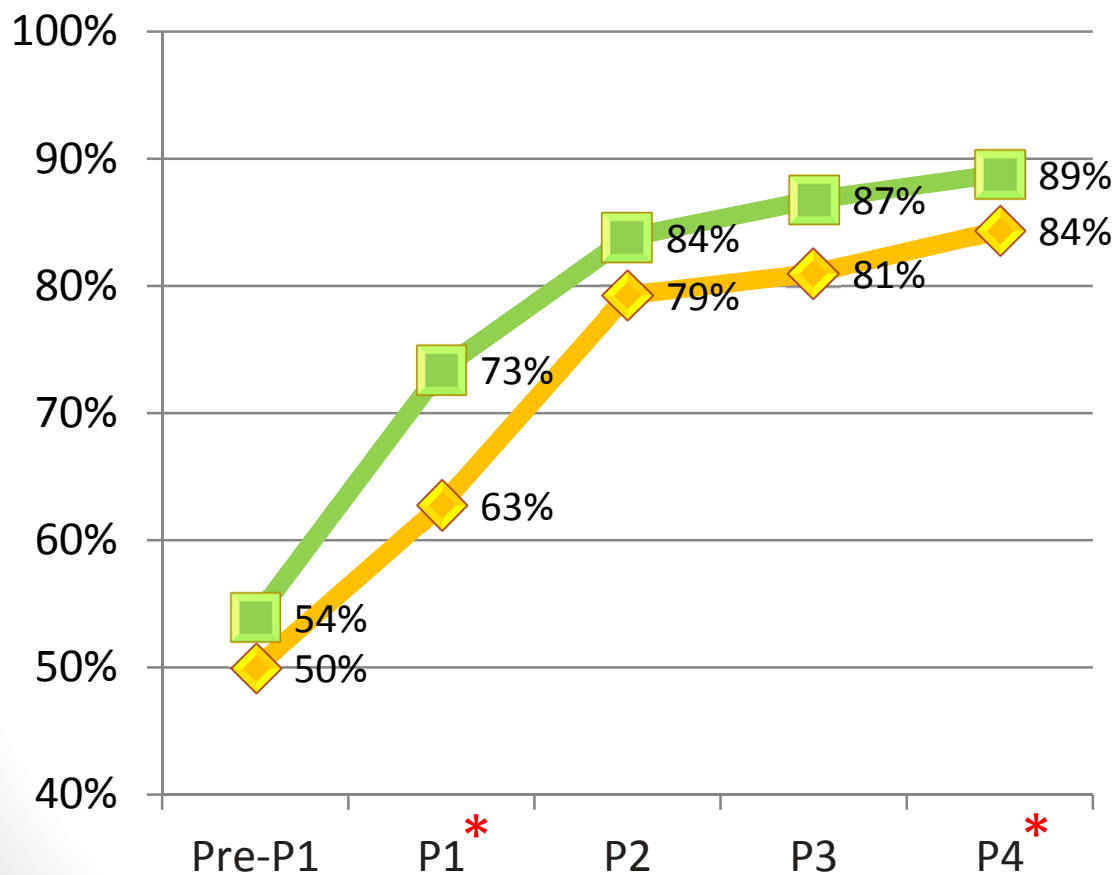
10 SLCO D/hh students took the assessment from Pre-P1 to P3



Repeated measures ANOVA:

($F(3, 27) = 34.160$, $P = .000$, Partial Eta Squared = .791, Power = 1.000)

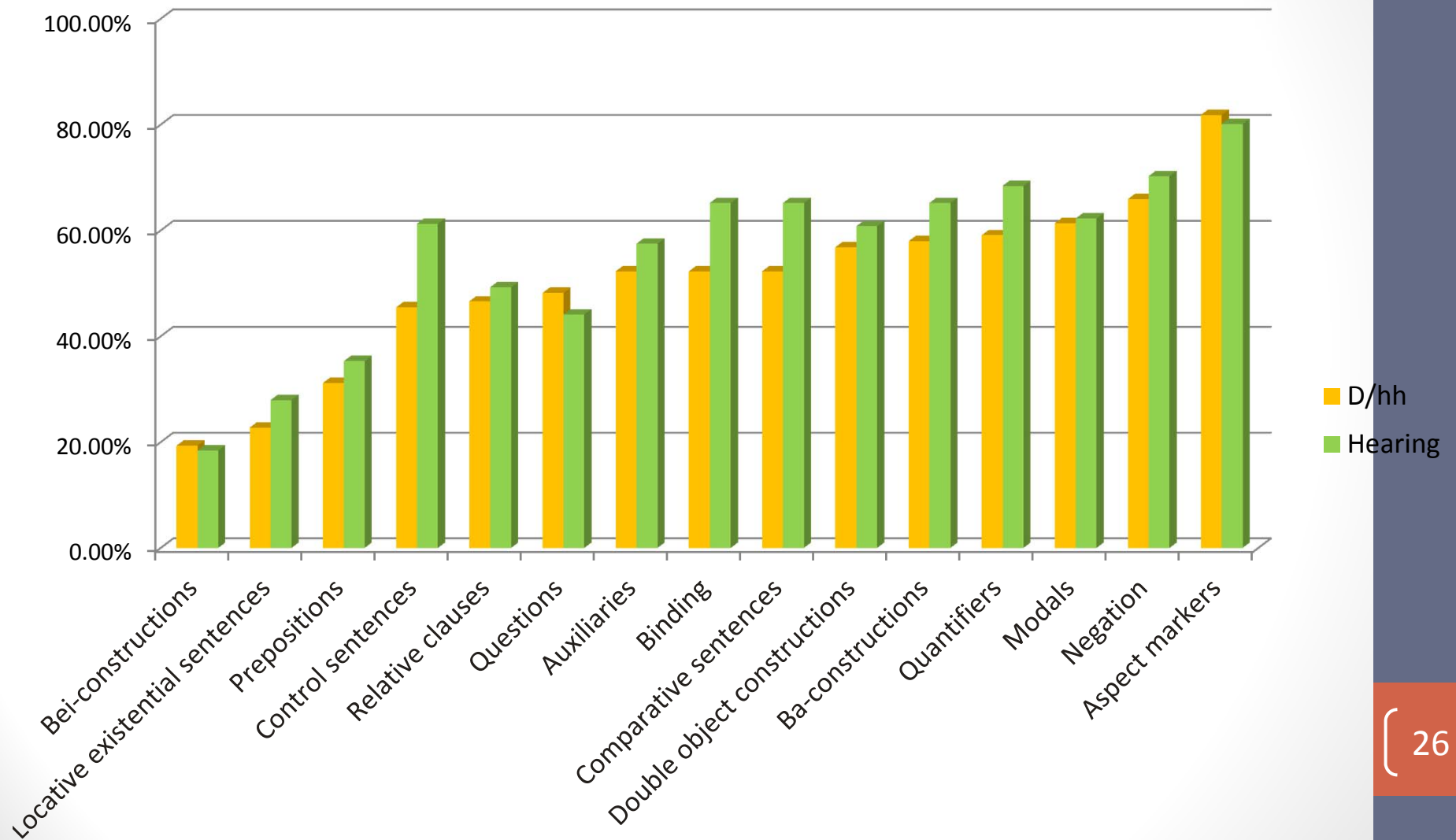
Overall performance of SLCO students from Pre-P1 to P4



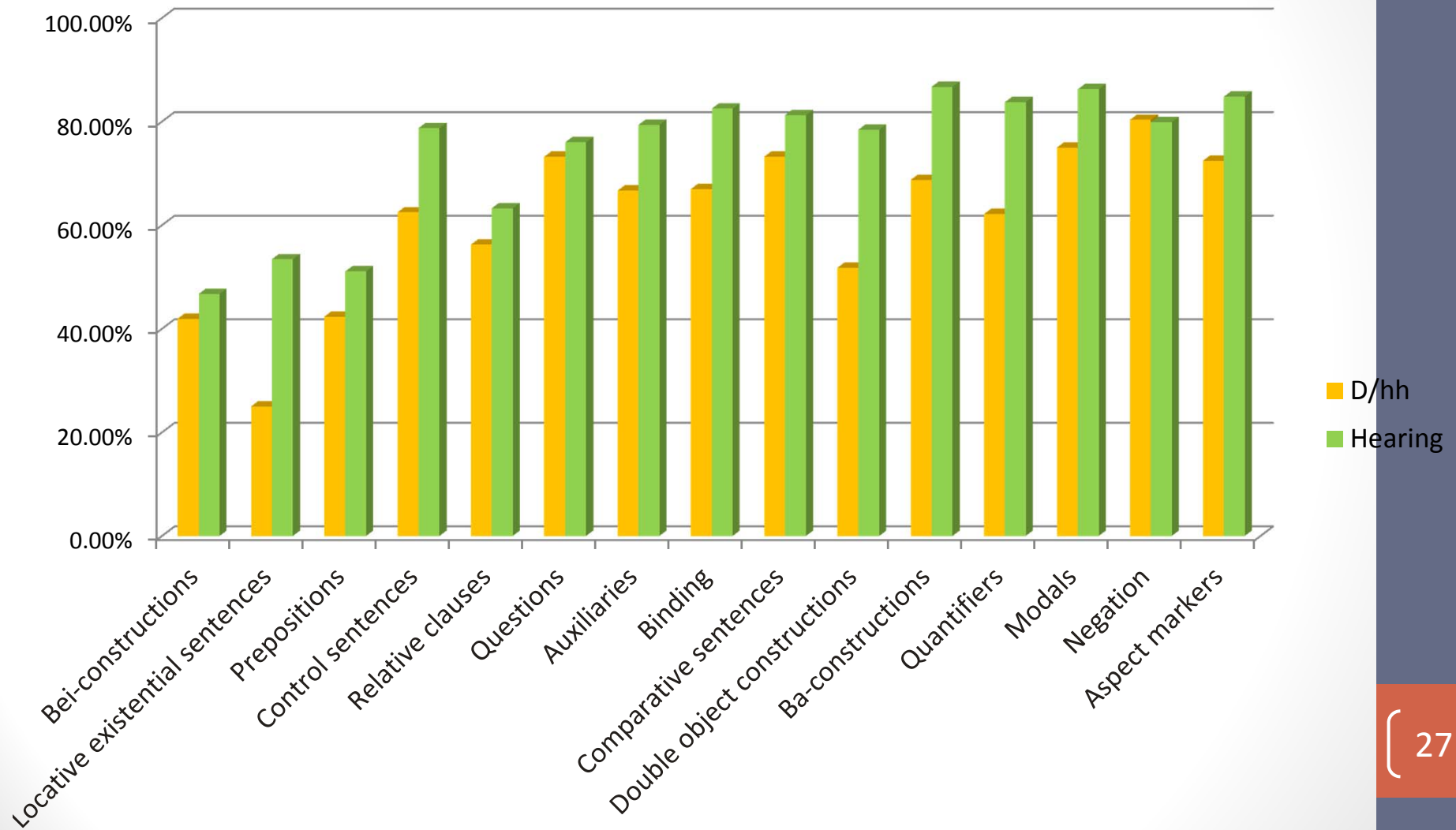
Difference between
SLCO D/hh and Hearing
P1: $t(92) = -2.411$, $p = .018^*$
P4: $t(106) = -2.515$, $p = .013^*$

◆ SLCO D/hh
■ SLCO Hearing

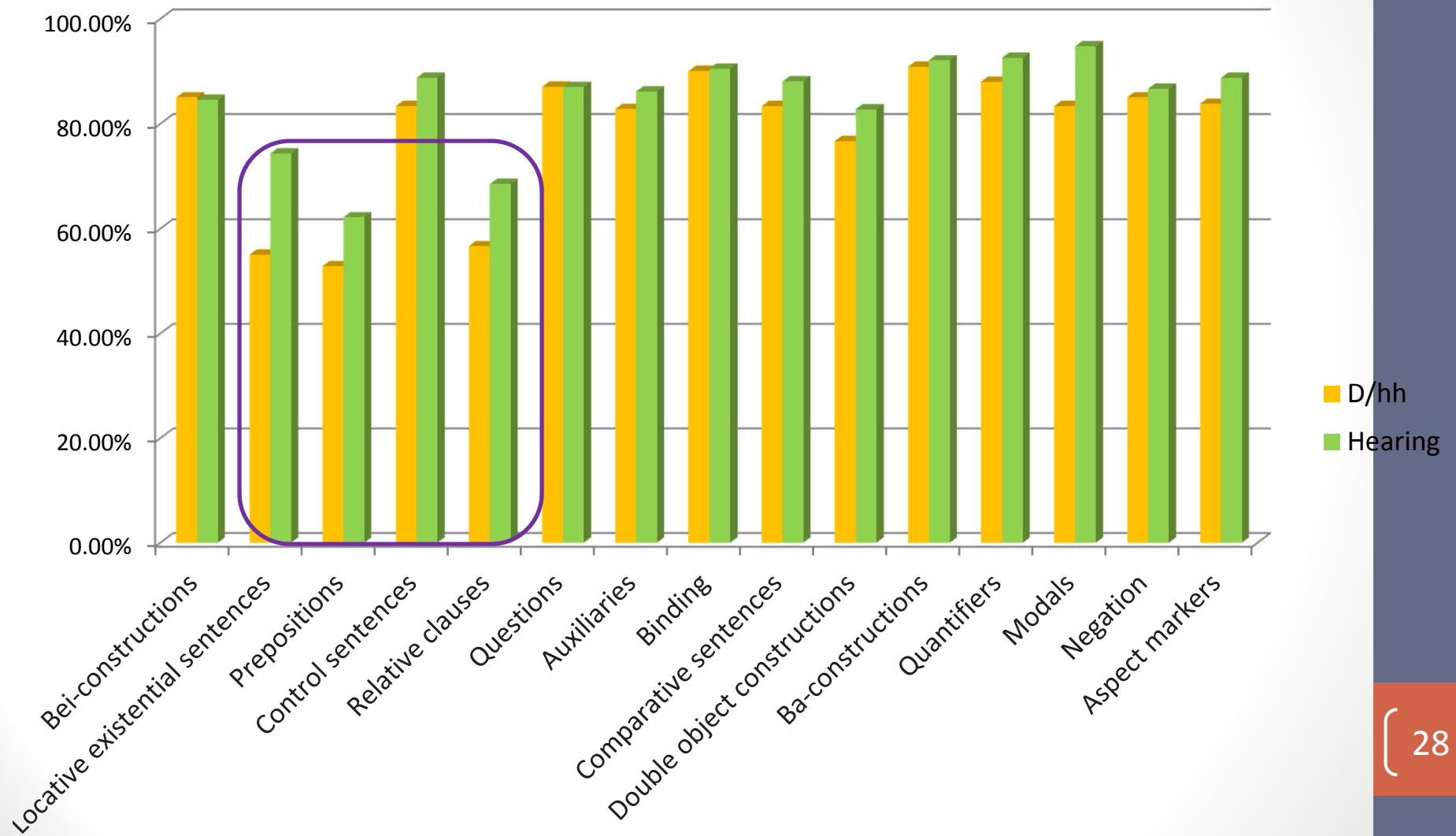
Pre-P1: D/hh vs. Hearing



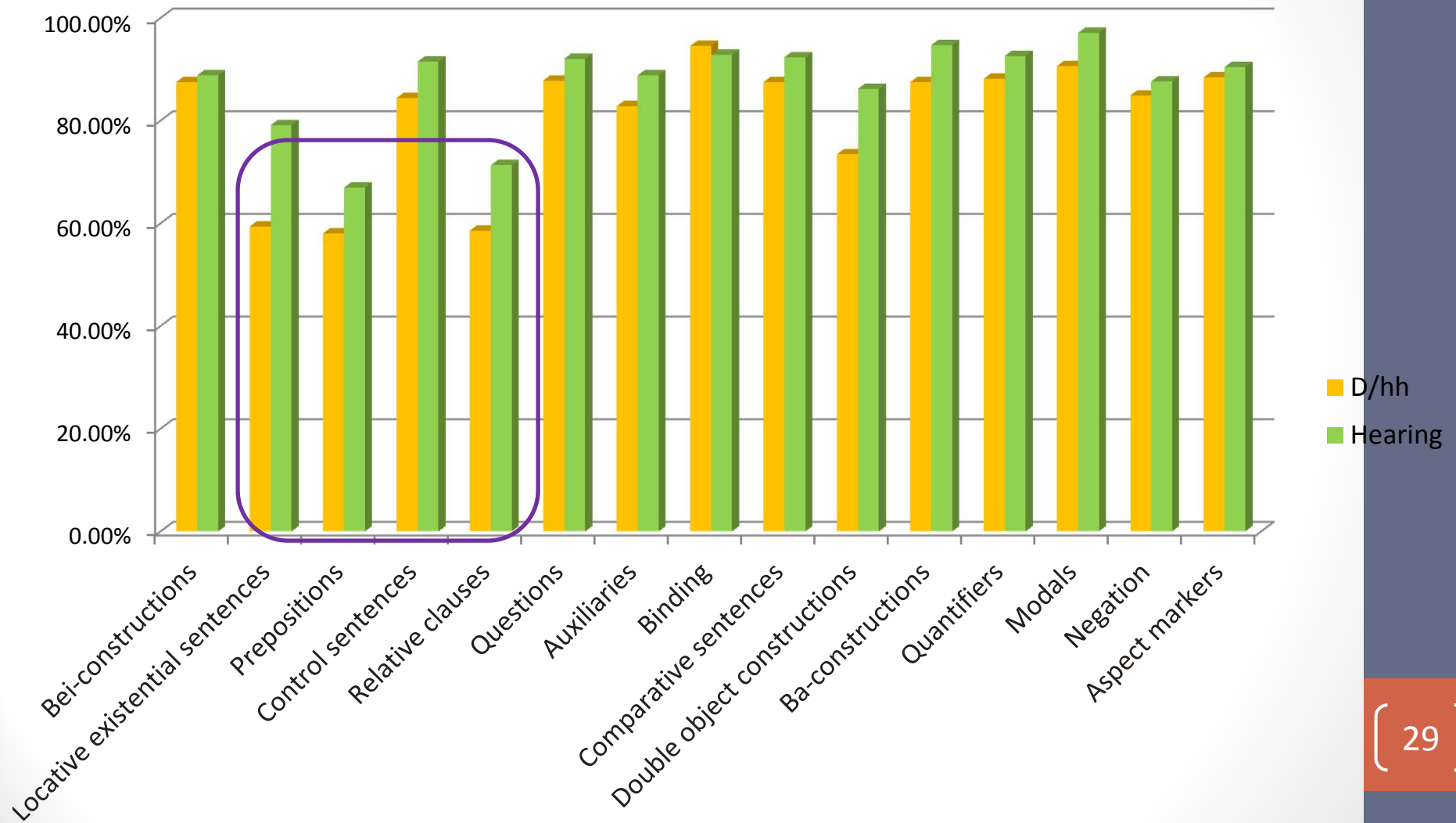
P1: D/hh vs. Hearing



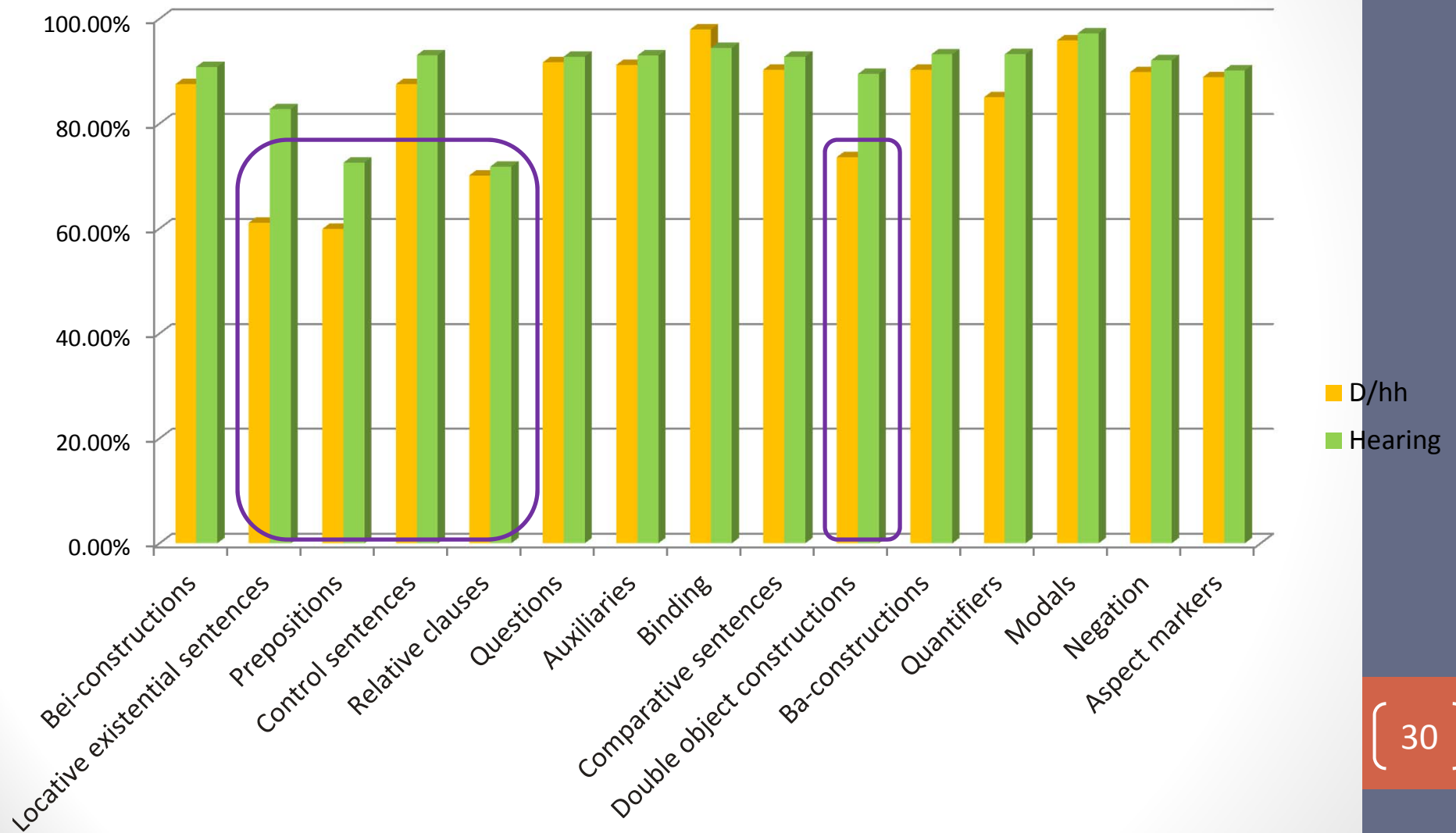
P2: D/hh vs. Hearing



P3: D/hh vs. Hearing

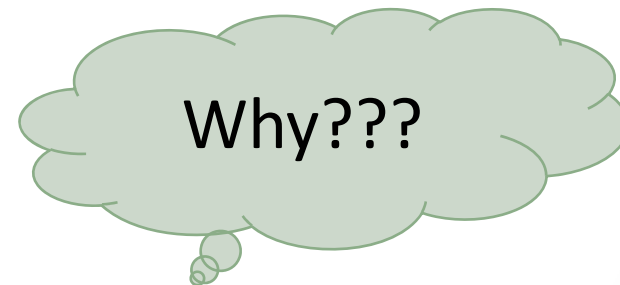


P4: D/hh vs. Hearing

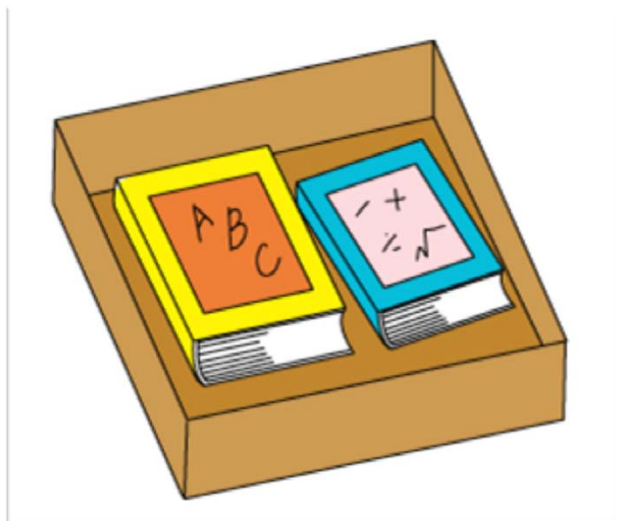


Findings of Chinese development in SLCO D/hh students

- Chinese grammatical knowledge improved along with hearing classmates, although a small gap exist;
- As a whole:
 - P3 & P4 have performed well on some complex structures, like bei-constructions, object control sentences, and questions (>85%);
- BUT, still have problems with
 - Locative existential sentences
 - Double object constructions
 - Relative clauses
 - Prepositions

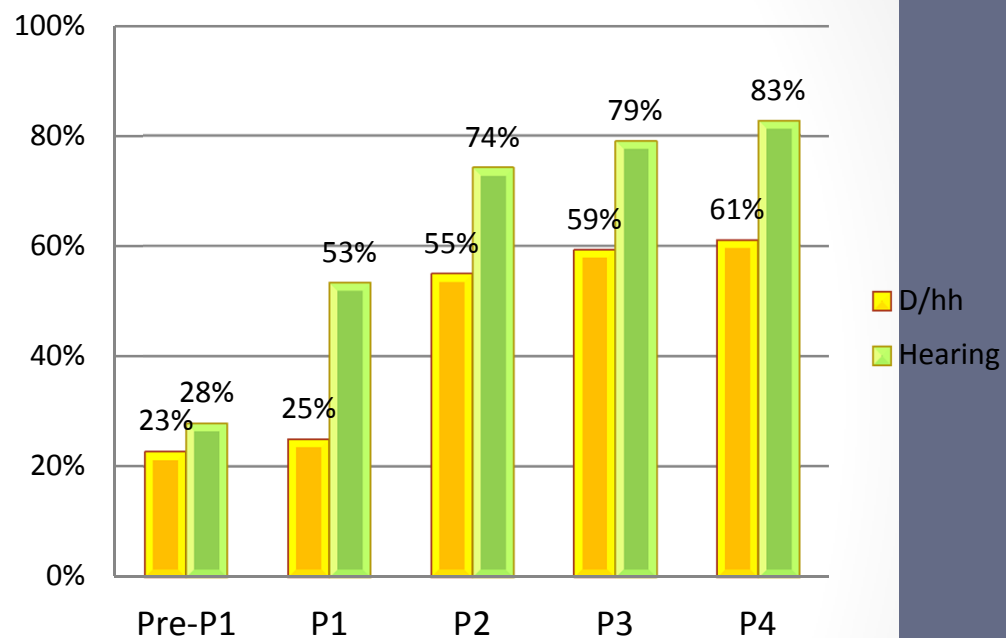


Word Reordering

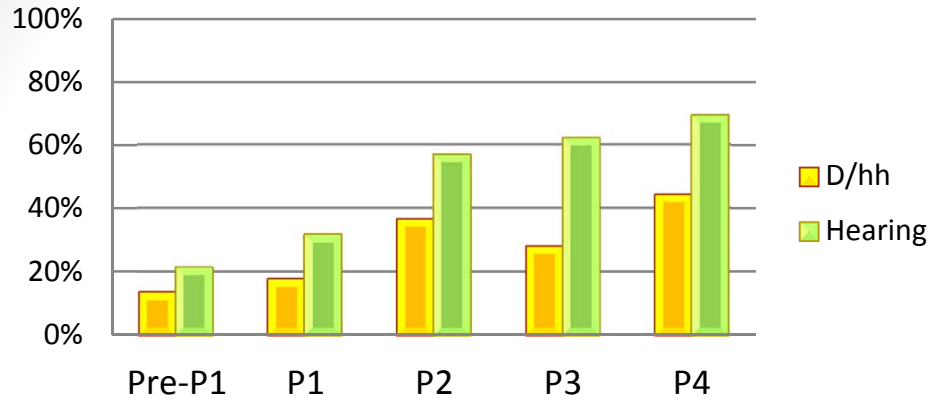


盒子里 着 两本书 放

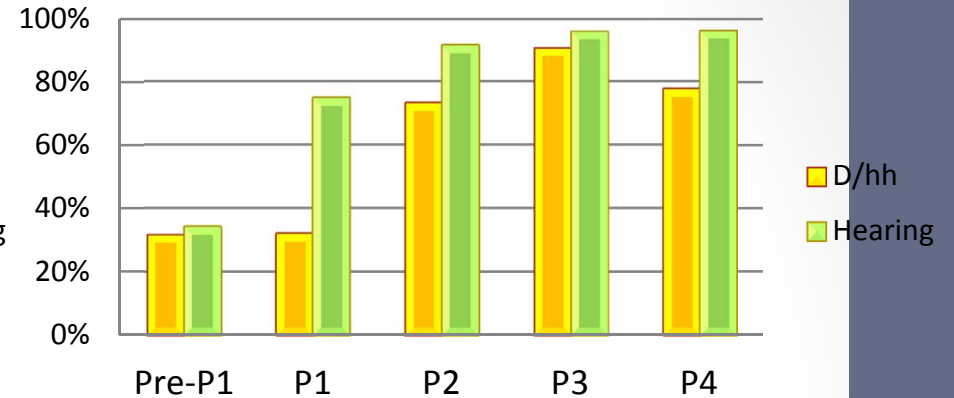
Locative existential sentences



Locative Existential Sentences (Animate NP)



Locative Existential Sentences (Inanimate NP)



- 房间里坐着一个老婆婆。
 - 一个老婆婆坐着房间里。
D/hh (43%); Hearing (34%)
 - 一个老婆婆房间里坐着。
D/hh (5%); Hearing (2%)
 - 房间里一个老婆婆坐着。
D/hh (9%); Hearing (3%)

- 盒子里放着两本书。
 - 两本书放着盒子里。
D/hh (16%); Hearing (5%)
 - 两本书盒子里放着。
D/hh (0.6%); Hearing (0.5%)
 - 盒子里两本书放着。
D/hh (4%); Hearing (only 1 token)

Imbalance performance → Animacy effect?

Word Reordering



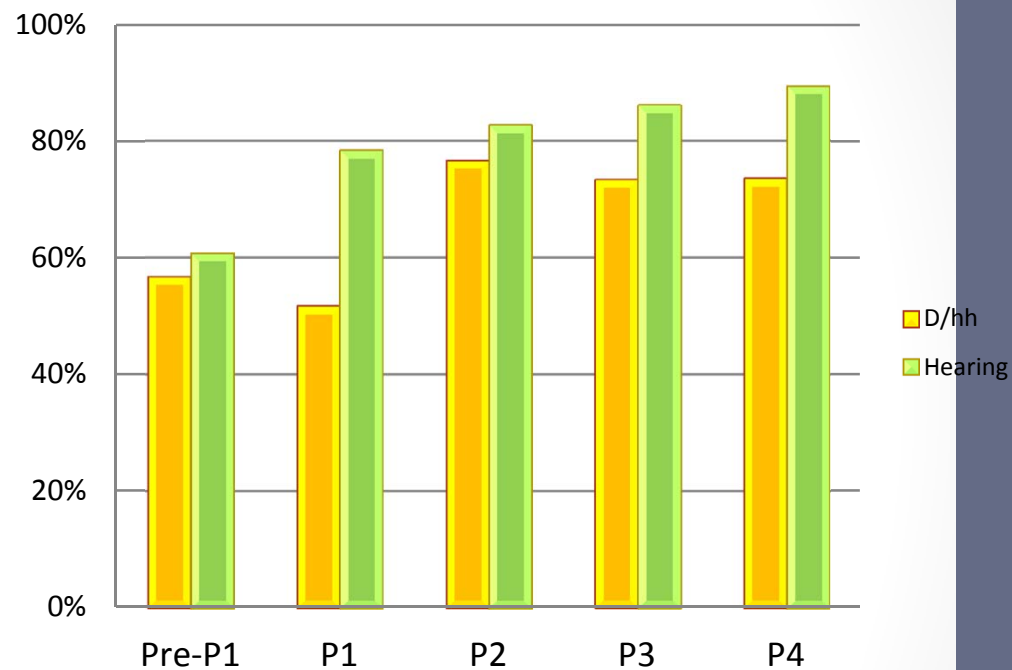
一本书

弟弟

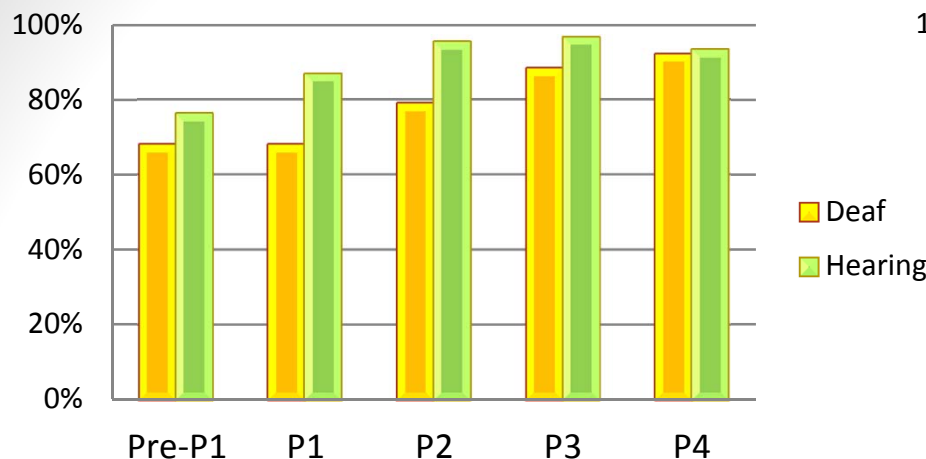
老师

给

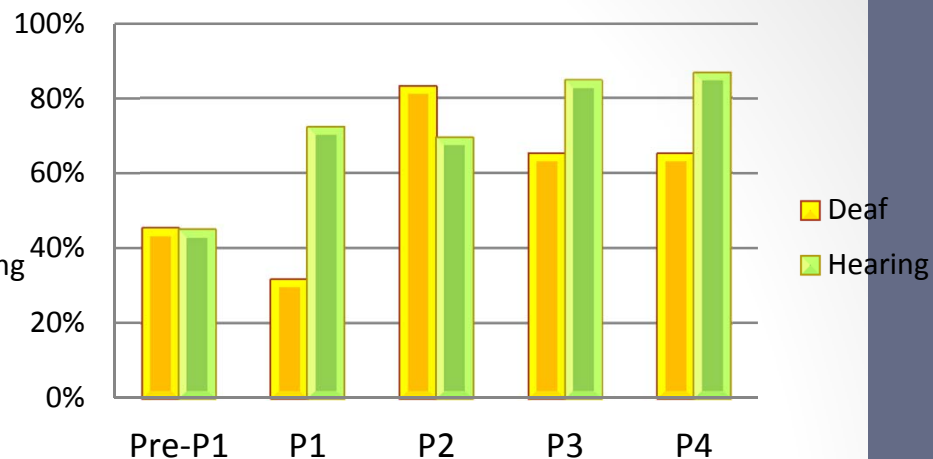
Double Object Construction



Double Object Construction (Gei)



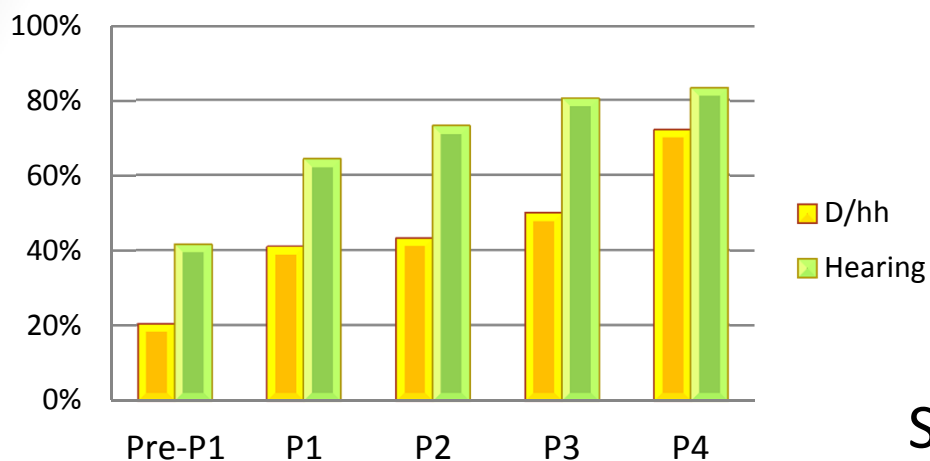
Double Object Construction (Song)



- 老师给弟弟一本书。
 - Cantonese transfer:
 - 老师给一本书弟弟。
 - D/hh (9%); Hearing (4%)
 - HKSL transfer (only in D/hh):
 - 老师一本书给弟弟。 (7%)
 - Acquisition of DOC is influenced by verbs ?
- 爸爸送妹妹一粒糖。
 - Cantonese transfer:
 - 爸爸送一粒糖妹妹。
 - D/hh (26%); Hearing (20%)
 - HKSL transfer (only in D/hh):
 - 爸爸一粒糖送妹妹。 (6%)

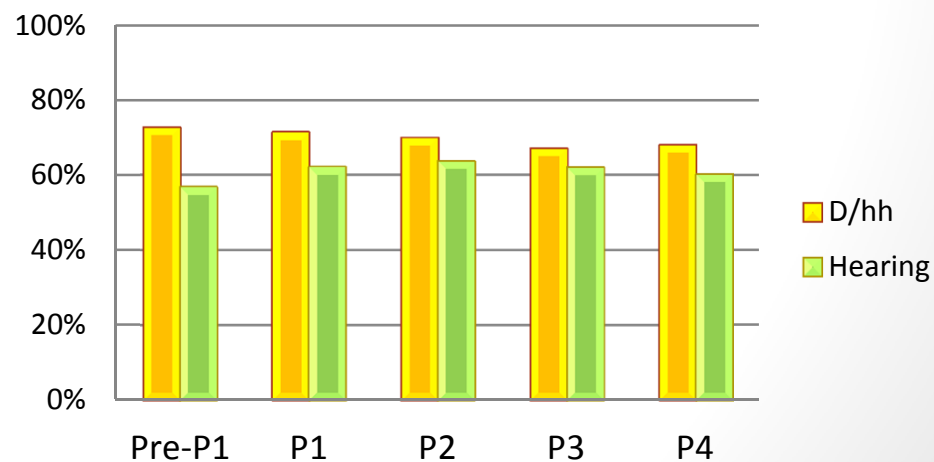
SS: 抱着小羊的小猫在睡觉。

Relative Clause (SS)

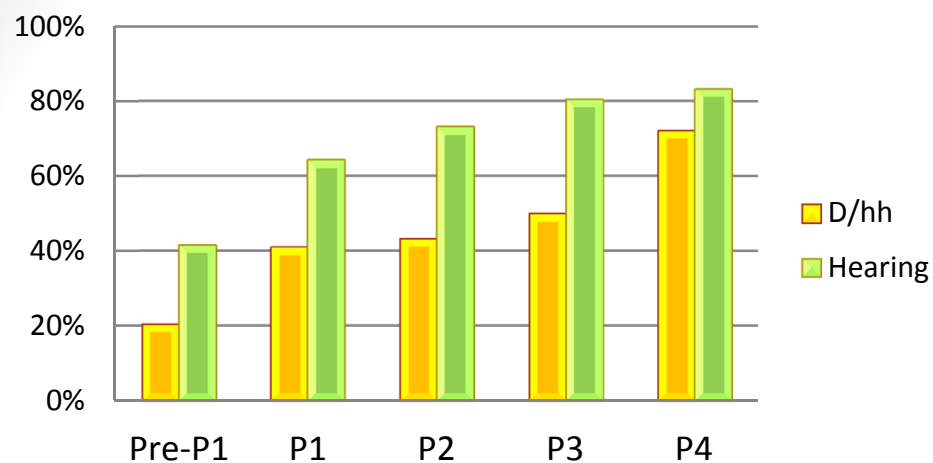


SO: 小羊抱着的小狗在睡觉。

Relative Clause (SO)



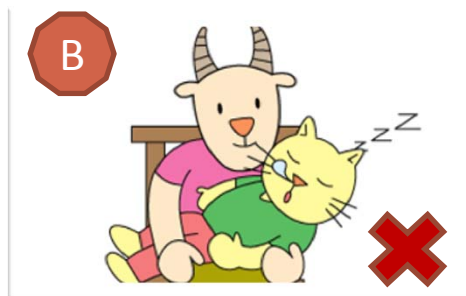
Relative Clause (SS)



SS: 抱着小羊的小猫在睡觉。



Error: Minimal Distance Principle?
抱着小羊的[小猫在睡觉]。



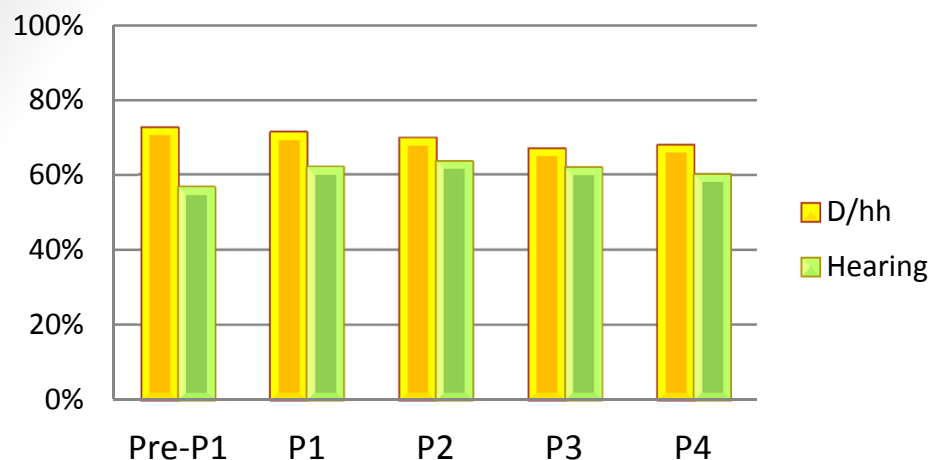
D/hh (33%)
Hearing (18%)

Other error →

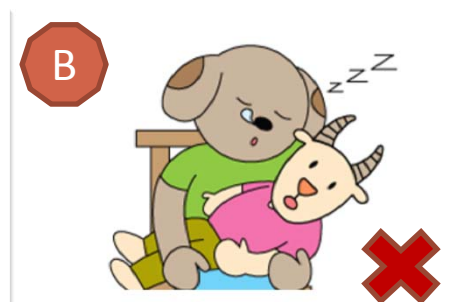


D/hh (14%)
Hearing (5%)

Relative Clause (SO)



SO: 小羊抱着的小狗在睡觉。



D/hh(11%)
Hearing(8%)

If Minimal Distance Principle
→ 小羊抱着的小狗在睡觉。

BUT → Conjoined structure?

小羊抱着的小狗在睡觉。

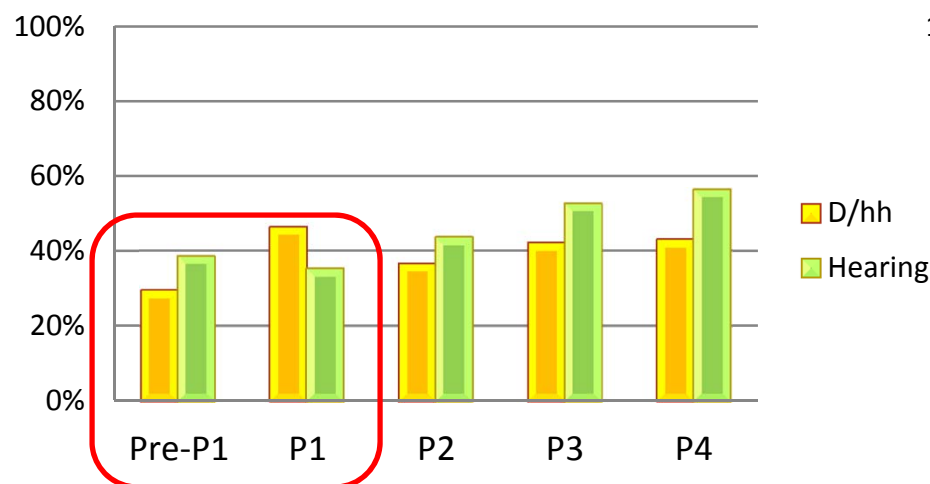
→ 小羊抱着小狗 & 小羊在睡觉



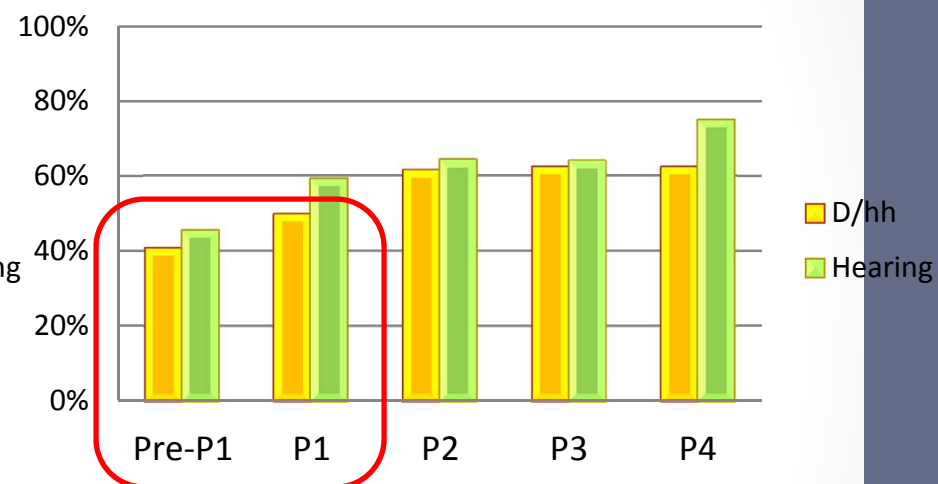
D/hh (18%)
Hearing (28%)

Directional prepositions

Prepositions (FIB)



Prepositions (PS)

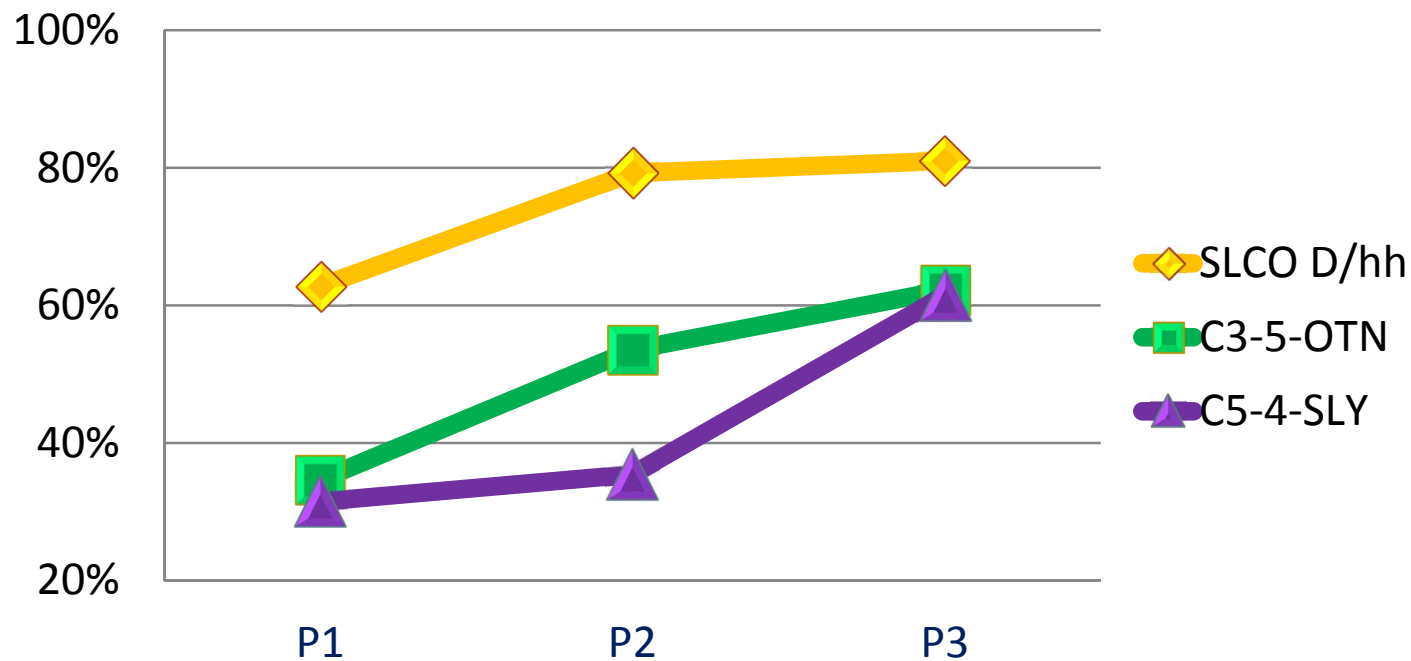


- Task effect ? (i.e. Pre-P1 & P1)
- Experience persistent difficulty in functional categories!



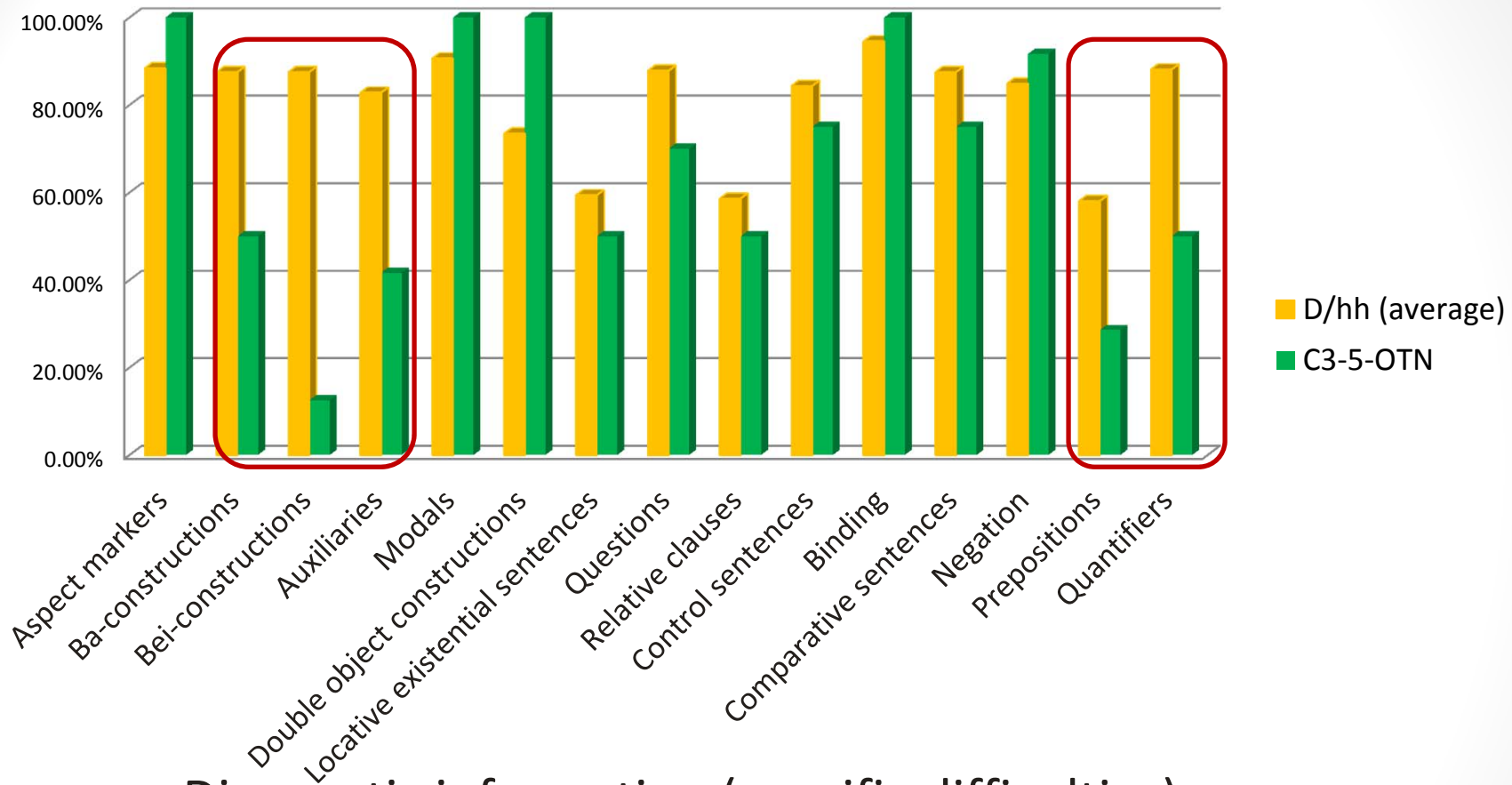
CASE STUDY: D/HH STUDENTS WITH LEARNING DIFFICULTIES (SUSPECTED)

Case study of D/hh students with learning difficulties



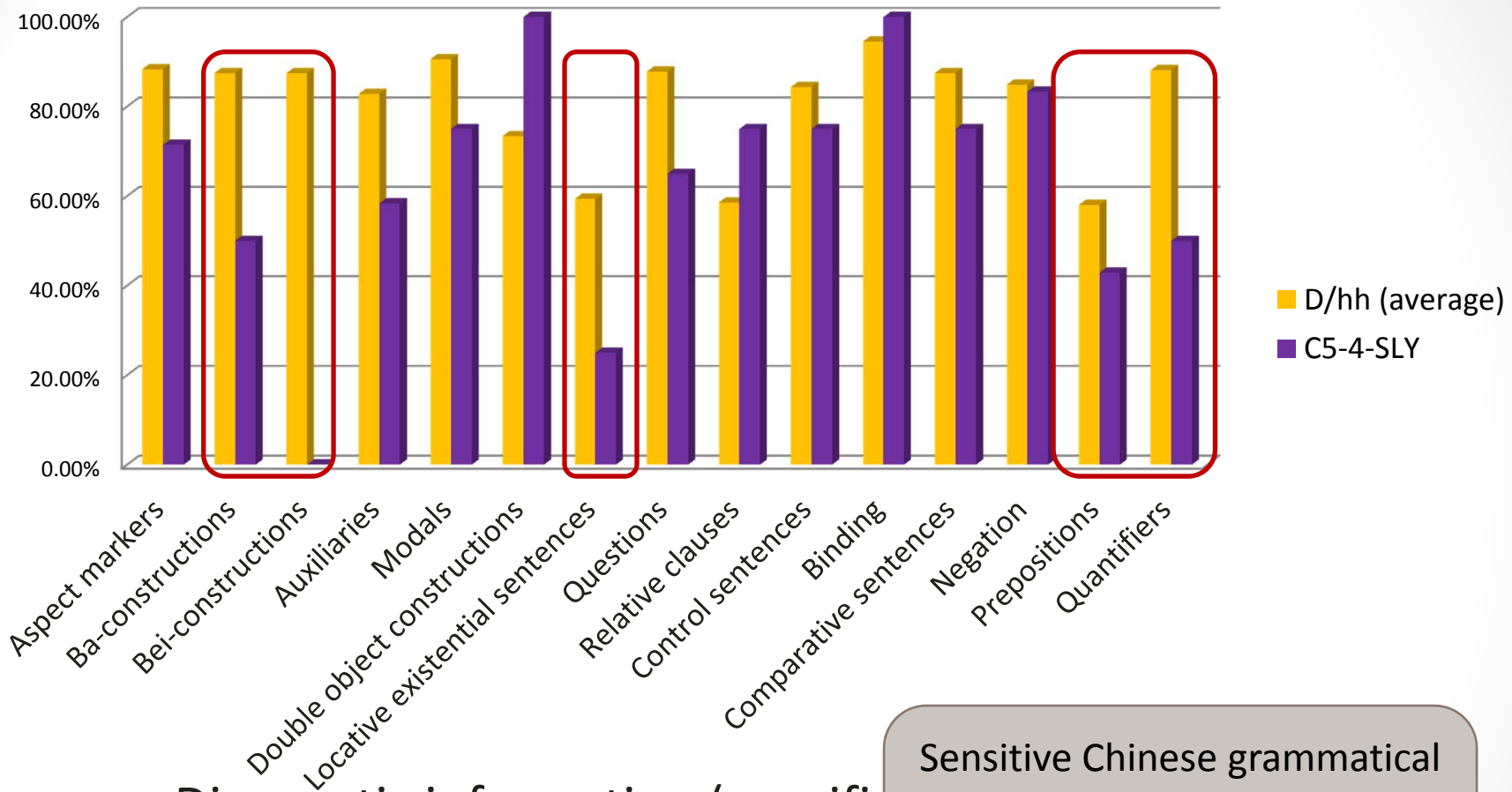
- Achievement information of the two cases:
 - Nearly below 2SD at each level;
 - About two years delay in Chinese grammatical development;
 - P3 (grammatical ability is equal to P1)

Assessment result at P3



- Diagnostic information (specific difficulties)
 - Bei-constructions & Ba-constructions;
 - Auxiliaries & Prepositions;
 - Quantifiers;

Assessment result at P3



- Diagnostic information (specific)
 - Bei-constructions & Ba-constructions
 - Locative existential sentences;
 - Prepositions & Quantifiers;

Sensitive Chinese grammatical structures for diagnosing students with language learning difficulties ???

FINDINGS & IMPLICATIONS



Current findings

- Under the SLCO environment, D/hh students' Chinese grammatical knowledge improved gradually;
- Compared with hearing students,
 - Although D/hh students still showed a little delay, the gap narrowed down gradually;
 - Even to P4, D/hh students as a whole still experience difficulties in syntactically complex sentences (i.e. relative clauses, locative existential sentences); and functional elements (i.e. prepositions);

Implications

As an language assessment tool, ACGK

- Reflect the language profiles of Hearing students and SLCO D/hh students in HK;
- Achievement information
 - ➔ help teachers determine to which degree deaf students have mastered Chinese grammar;
- Diagnostic information
 - ➔ help ST identify students' specific learning difficulties in some Chinese grammatical structures and make special training materials;

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

- D/hh & Hearing students in SLCO programme
- Students who participated in the study
- Prof. Yang Xiao-lu
- Dr. Tony Lee

COMMENTS & QUESTIONS

