

# Development of academic language in Chinese Mandarin speaking young children

Si Chen<sup>1</sup> & Jing Zhou<sup>2</sup>

<sup>1</sup>Harvard Graduate School of Education

<sup>2</sup>East China Normal University

# Motivation

- Recent research highlights of academic language:
  - The critical role of academic language in school success (Snow, 2010)
  - Development of academic language in young age (Henrichs, 2010)
  - Assessment tool for adolescent's academic development (Uccelli et al., 2015)
- Our puzzle...
  - The development of Chinese Mandarin speaking children young children?
  - A reliable assessment tool for Chinese young children?

# In this study:

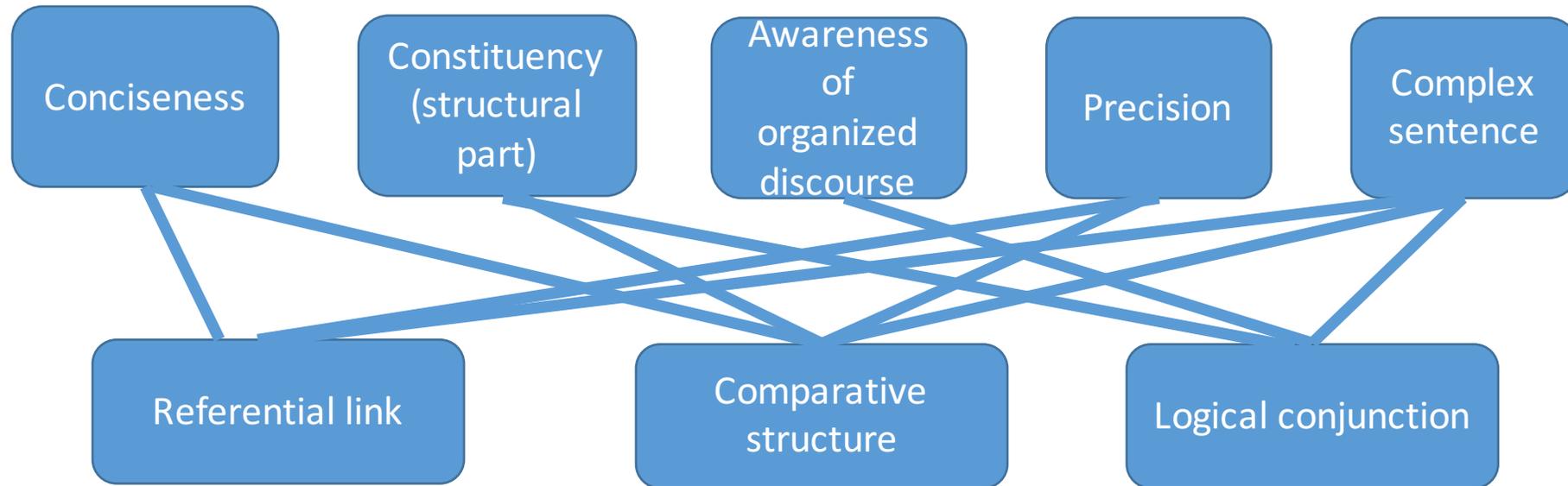
- We developed:
  - A Chinese Academic Language Assessment (CALA)
  - A pilot task
  - To evaluate young Mandarin-speaking children's academic language skills
- We ask 2 questions:
  - What is the psychometric properties of the CALA?
  - Can children's vocabulary and cognitive skills predict the CALA score? If so, how?

# Methods

- Participants
  - 121 Mandarin-speaking monolingual children
  - Age 4-6, half female
  - Typical middle-class families, 2/3 mothers with college education
- Measures
  - Academic language: the CALA
  - Early language development: PPVT Chinese
  - Cognitive development: Bracken school readiness
  - SES indicators: family income, mother education level...
- Data analytic plan
  - 2PL IRT models
  - SEM

# The CALA: design

- Inspired by the Core Academic Language Skills (CALS) (Uccelli, et al., 2015)
- Academic language register of Young Chinese children:



# The CALA: 3 parts

- Referential link
  - children are asked to understand a sentence and find out which subject is referenced by the specific personal/demonstrative pronouns. There are 10 items in this part.
- Comparative structure
  - According to the comparative structure of a sentence, children need to point out the correct picture or answer specific questions. There are 10 items in this part.
- Logical conjunction
  - Children needs to choose the sentence with correct logical conjunctions from two sentences. There are 10 items in this part .

# Referential link

- *E.g. (In CALA 1.2)*
  - *Hospital is a quiet place, people go **there** to see doctor.*
  - Q: What does the “*there*” mean?



A. 地方

A. Place



B. 医院

B. Hospital



C. 人们

C. People

# Referential link

- *E.g. (In CALA 1.4)*
  - *Dolphins love to eat small fishes. **They** are not able to use teeth and chew, they just swallow fish as a whole.*
  - Q: What does the “**They**” mean?

它们 They



A. 海豚

A. Dolphins



B. 小鱼

B. Small Fishes



C. 牙齿

C. Teeth

# Comparative structure

- *E.g. (In CALA 2.1)*
  - *Little sister enjoys meat and soup everyday, she is taller than her older brother now.*
  - Q: Who is **taller**, brother or sister?



A 哥哥

A. Brother



B 妹妹

B. Sister

# Comparative structure

- *E.g. (In CALA 2.2)*
  - *Daddy did not bring home a present! Little sister felt **a little** disappointed, big brother felt **very** disappointed.*
  - Q: Who was **more** disappointed? Brother or sister?



A 哥哥

A. Brother



B 妹妹

B. Sister

# Logical conjunction

- E.g. (In CALA 3.3)
  - (**Wrong**) Brother said: “Dad said he will take me fishing this weekend, **so** he did not take me.”
  - (**Correct**) Sister said: “Dad said he will take me fishing this weekend, **but** he did not take me.”
- Q: Who’s correct?
- A. Brother B. Sister



“爸爸答应我周末去钓鱼，**所以**他没有带我去。”



“爸爸答应我周末去钓鱼，**但是**他没有带我去。”

# Logical conjunction

- E.g. (In CALA 3.6)
  - **(Correct)** Brother said: “**Not only** children love to read picture books, **but also** adults do.”
  - **(Wrong)** Sister said: “**Although** children love to read picture books, **but also** adults do.”
- Q: Who’s correct?
- A. Brother B. Sister



“好看的故事**不仅**小朋友喜欢，**而且**大人都喜欢。”

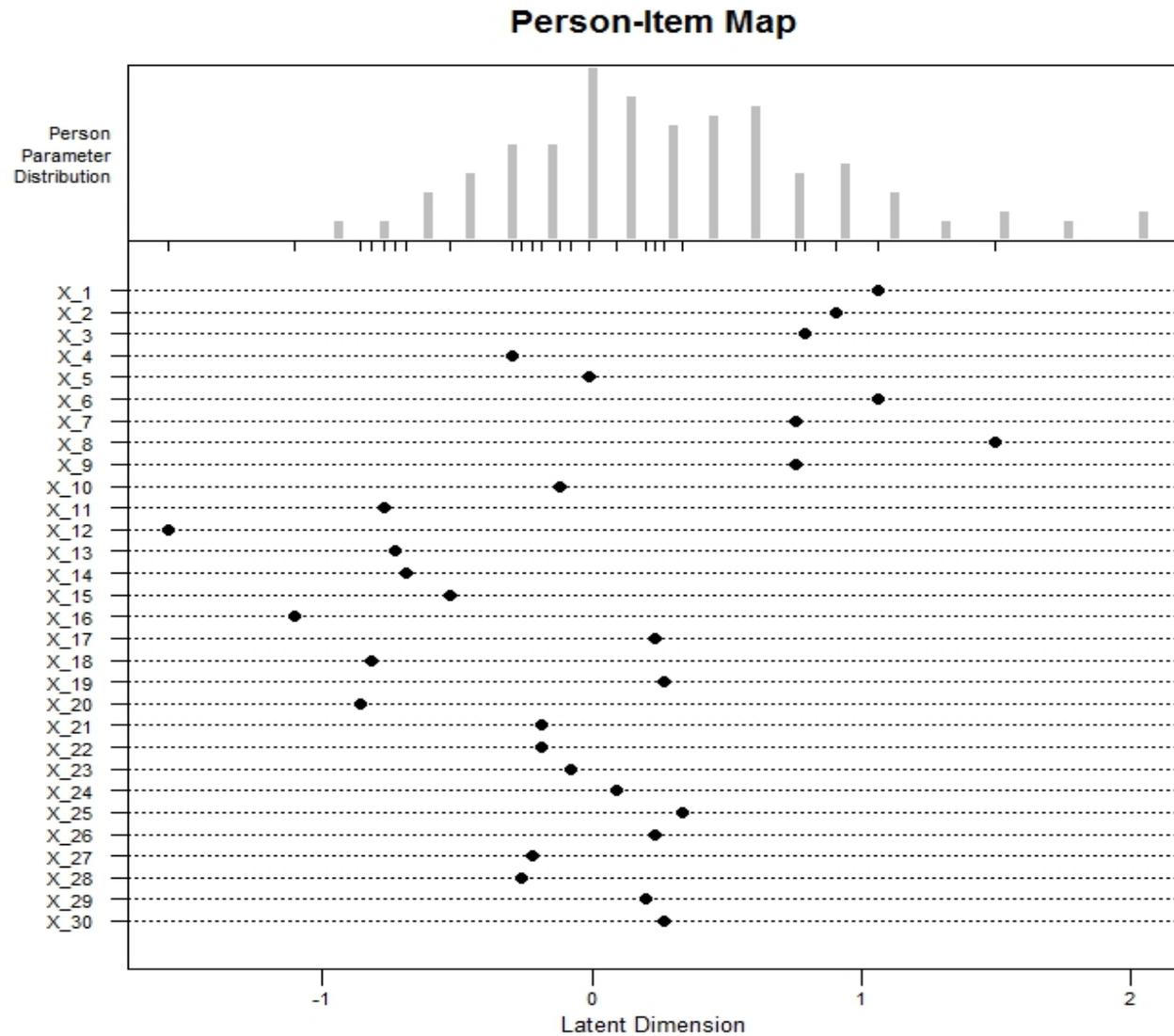


“好看的故事**虽然**小朋友喜欢，**而且**大人都喜欢。”

# Result 1: IRT

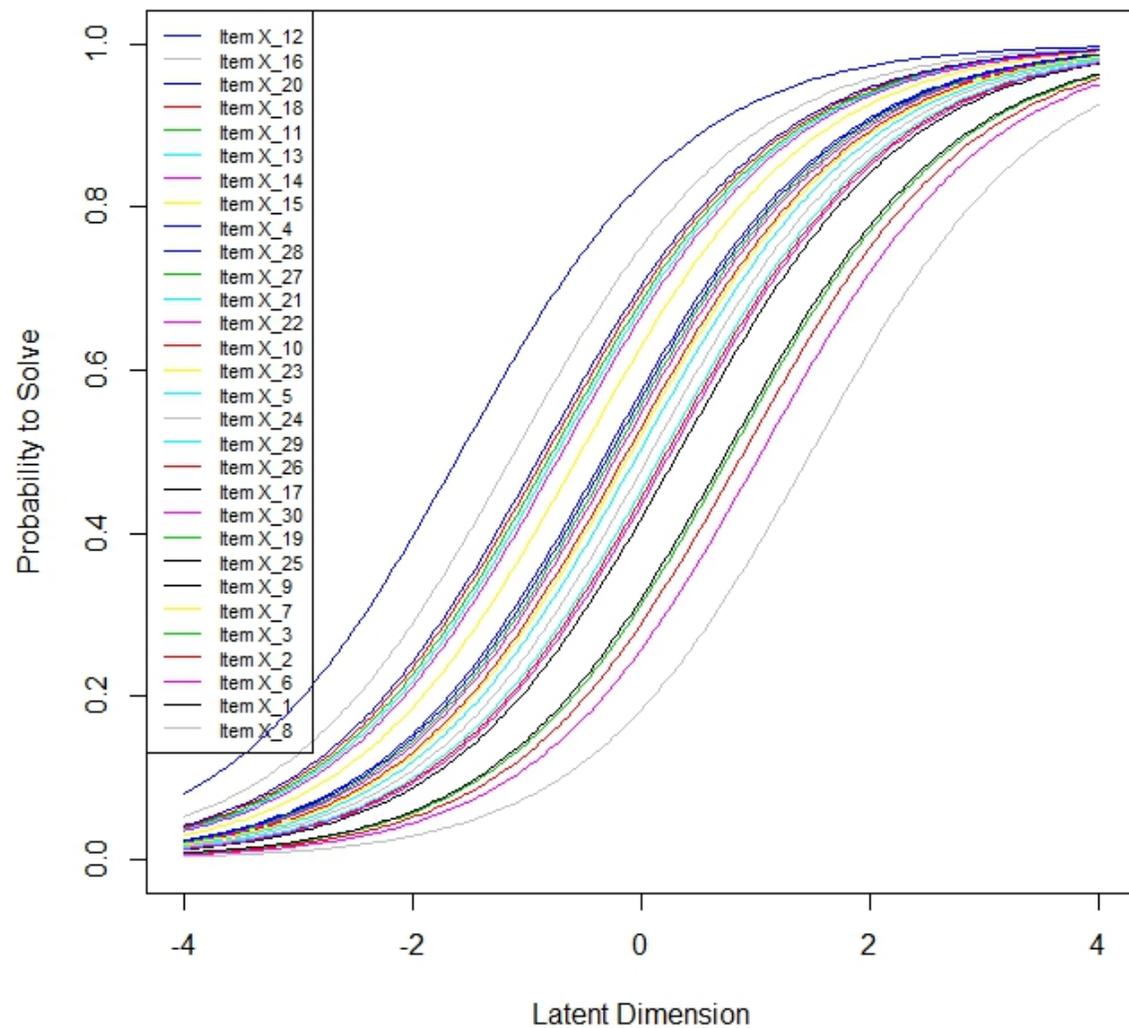
- Psychometrical properties of the CALA:
  - 2PL IRT models to select CALA items.
  - Roughly 30% items are excluded from the final version because of low internal consistency.
  - The remaining 20 items have an internal consistency of 0.68. As shown in Figure.1 below, the items in combination have adequate psychometric properties.
  - *Comparative structures* is weakly correlated with *referential chains* ( $r = 0.23$ ,  $p < 0.01$ ) and *logical conjunctions* ( $r = 0.19$ ,  $p = 0.03$ )
  - *Referential chains* and *logical conjunction* are not correlated.

# CALA: Before

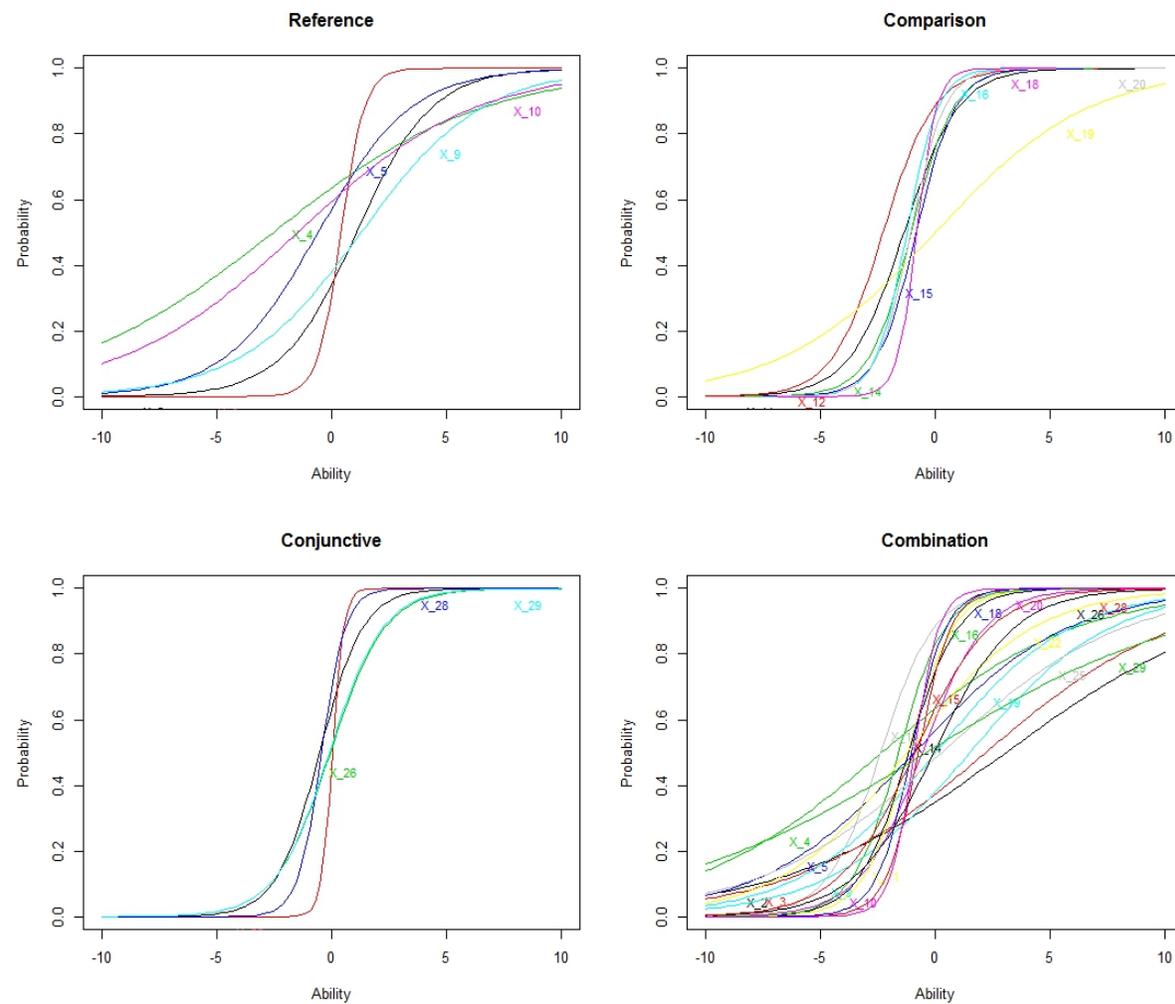


# Before

### ICC plot

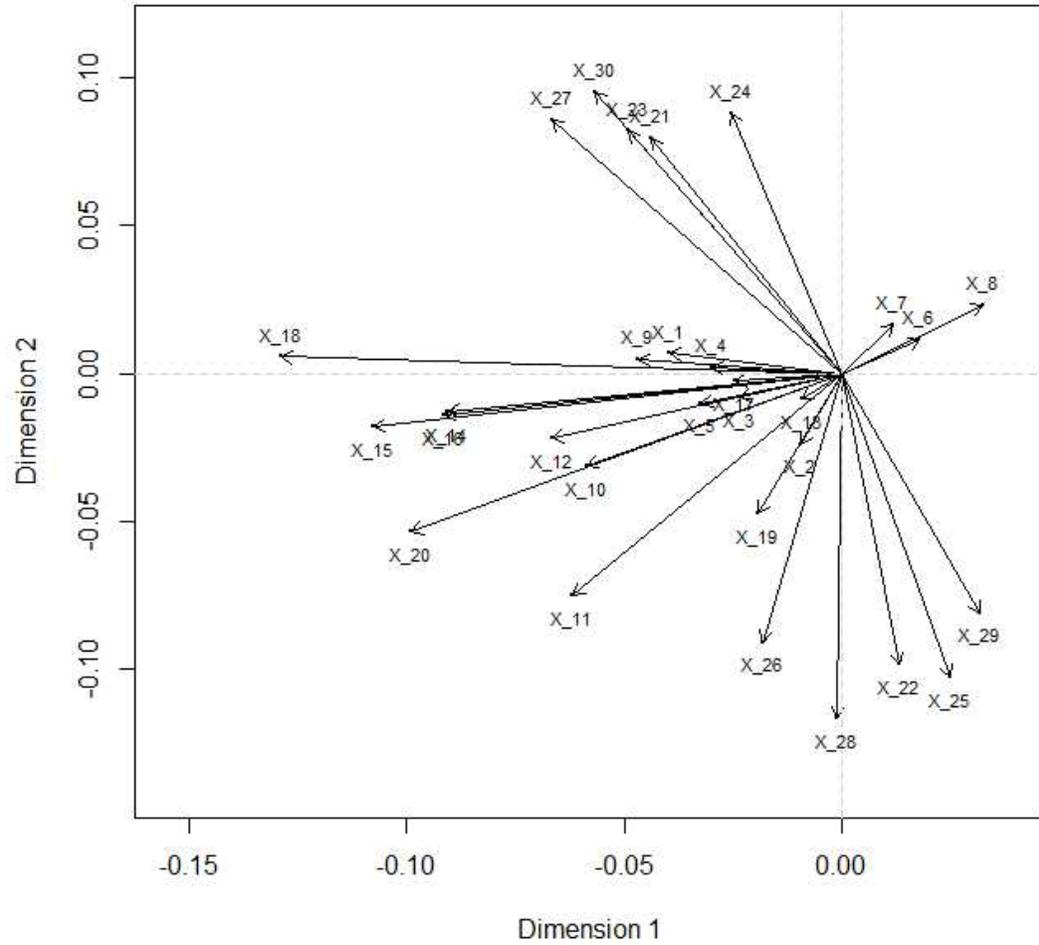


# After



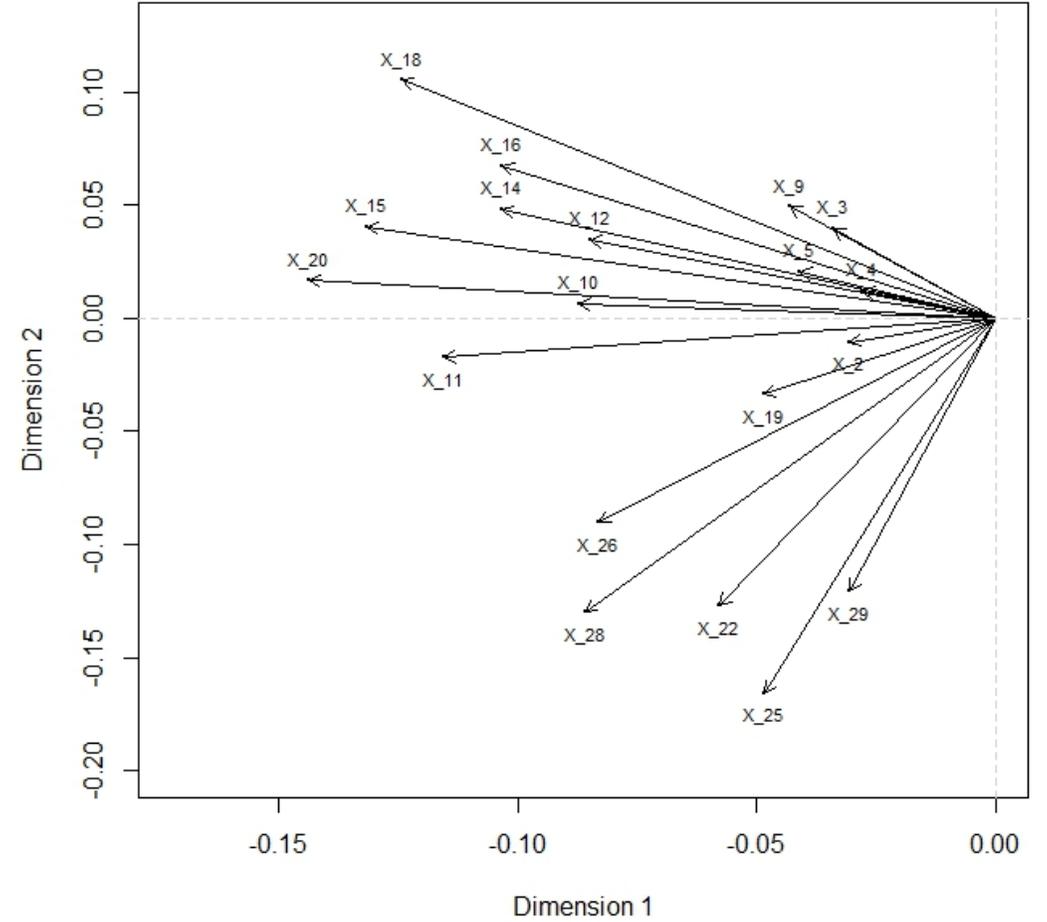
# Before

### Item Loadings



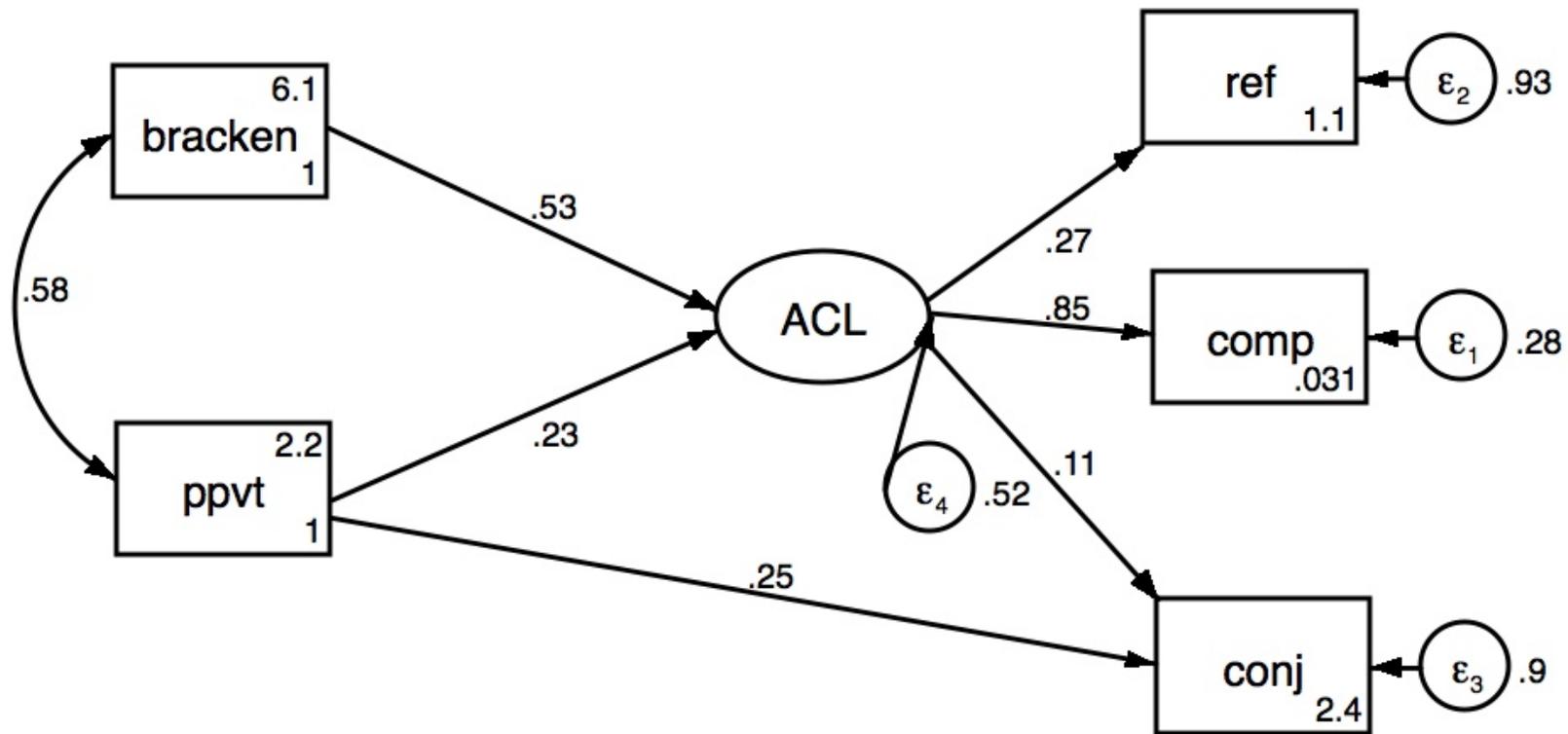
# After

### Item Loadings



# Result 2: SEM

- Based on the new version of CALA (20 items)
  - Latent variable: ACL (academic language), constructed by the 3 components of CALA
  - Predictors: PPVT and Bracken
  - Control covariates: age, gender, SES indicators



# Discussion

- The relationship between AL and basic language skills:
  - Same AL skill, lower score in assessment?
  - Language minority children?
  - How to help children in classroom?
- Limitation and the next step:
  - Replace items with low discrimination, add new items (and test again)
  - Qualitative measure of academic language of young children: academic language narrative

# Thank you!

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