

# Assessment of language skills in deaf children

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# Language Assessment

Language is essential for many other school skills.

*Why do assessment?*

To evaluate development :-

- a. In an individual child over time
- b. In an individual child in comparison to the group
- c. In an individual child to determine if a language problem
- d. In a group to evaluate the efficacy of a program

# Language Assessment

The **purpose** of assessment will determine which measures you choose to use.

For example:

- to determine if a language problem is present, measures are needed that are normed and can discriminate.
- to evaluate the efficacy of a program general measures are more useful than very detailed descriptions and clearer.

# Language Assessment

Important **criteria** for assessment tools:

- **Validity:** test what they say they test
- **Reliability:** test always in the same way
- **Practicality:** can be done efficiently

# Language assessment in bilingual children

Bilingualism or multilingualism is common in many countries

but a monolingual model is often adopted in creating assessment tools.

Very few instruments specifically address the bilingual situation of children:

- language input
- language dominance
- norms

Tests should take into account children's social and cultural background e.g. identity, attitude, preferences.<sub>5</sub>

# Language assessment in bilingual children

Results from BISLI children on 4 tests (French)

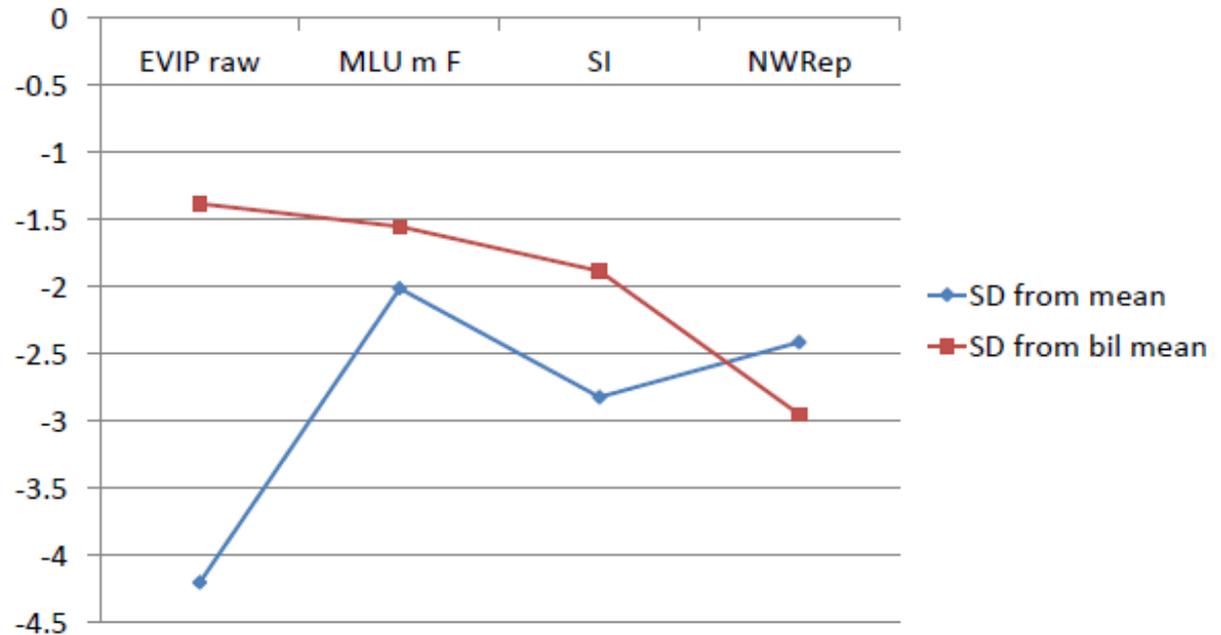
EVIP – Vocabulary

MLU

Sentence Imitation

NWR

Comparison to bilingual norms (same amount of exposure to French; Elin Thordardottir, 2011; in preparation)



Blue line: results of bilingual children with SLI compared to MONOLINGUAL NORM;  
Red line: results of bilingual children with SLI compared to BILINGUAL NORM

# Language assessment in bilingual/bimodal children

- Many different types of deaf children:
  - sign language early
  - sign language late
  - no sign language
  - increased access to spoken language through a CI or hearing aids.
- Most deaf children are bilingual : bimodal  
Deaf parents speak and sign with their deaf children : more than 80% of their input in bimodal (Baker & van den Bogaerde 2012)
- Assessment procedures need to reflect this bimodal bilingualism

# Language assessment in bilingual/bimodal children

The importance of the **language input**

What is the form of the bimodal bilingualism?

- sign with some speech? Grammar of the sign language?
- speech with some sign? Grammar of the spoken language?

Which modality is offering full information?

# Language assessment in bilingual/bimodal children

Consider all these issues in the light of recent work on bilingual language assessment:

No need to reinvent the wheel.

COST ISO804 action : European network of researchers  
**Language Impairment in a Multilingual Society:  
Linguistic Patterns and the Road to Assessment**

## COST action: IS0804

### Language Impairment in a Multilingual Society: Linguistic Patterns and the Road to Assessment

1. Rapid growth in populations of bilingual children internationally.
2. In some countries this is inherent.
3. These bilingual children form the majority of the school population.
4. Teachers and practitioners face a diagnostic dilemma.
5. Emphasis on finding language disorders
6. the linguistic manifestations of child second language acquisition and development language disorder are similar.

**More than 200 researchers** from 27 countries

including USA, Canada, South Africa, Middle East, Far East.

# Instrument development for bilingual populations



LITMUS = Language Impairment Testing in  
MULTilingual Settings:

- a. Parental questionnaires
- b. Narrative and Discourse tasks
- c. Grammatical tasks
- d. Lexical tasks
- e. Non Word Repetition tasks
- f. Non-verbal cognitive tasks

# Definitions

## 1. **Bilingual children**

Children functioning in two (or more) languages: **including sign languages** (production/comprehension) including simultaneous and sequential bilinguals.

## 2. **Bilingual language impairment**

Children below chronological age in **both** languages.  
Must have enough input in both.

# LITMUS tasks



## Instrument development:

- a. **Parental questionnaires**
- b. **Narrative and Discourse tasks**
- c. **Grammatical tasks, in particular Wh- Questions task & Sentence Repetition Task**
- d. **Lexical tasks**
- e. **Non Word Repetition tasks**
- f. **Non-verbal cognitive tasks**

# Parents Bilingual Questionnaires

## PaBiQ (*Tuller 2013*)

1. Was the child late in language development?
2. Is there a family history of language difficulties?
3. How rich has language exposure and use been?
4. How rich is current language use and exposure?

# Parents Bilingual Questionnaires

## PaBiQ: Sections

Bi-SLI

LITMUS

### PABIQ:

Sections	Items
1. <i>General info. about the child</i>	Birth date, country of birth, languages currently spoken, lg. most at home in.
2. <i>Child's early history</i>	1 <sup>st</sup> word, 1 <sup>st</sup> sentence, early lg. concerns, hearing problems, lg. exposition < age 4 (frequency--never/rarely/ sometimes/ usually/ always, age of onset, contexts)
3. <i>Current Skills</i>	5 Items: How child expresses him/herself compared to children same age, Whether child speaks like a monolingual child of same age, Difficulties making correct sentences, Satisfaction child's ability to express him/herself, Whether child feels frustrated when unable to communicate.
4. <i>Languages used at home</i>	Lg. used between child and parents/other adult/siblings, lg.-related activities.
5. <i>Language richness</i>	weekly extra-curricular activities in each lg, lg. with playmates, lg. with family friends
6. <i>Information about the mother and the father</i>	Country of birth, lg. at workplace, years of education, self-assessment of each lg.
7. <i>Difficulties</i>	with reading and spelling, understanding, expressing oneself (siblings, mother, father)

# Parents Bilingual Questionnaires

## PaBiQ

### Summary of research findings

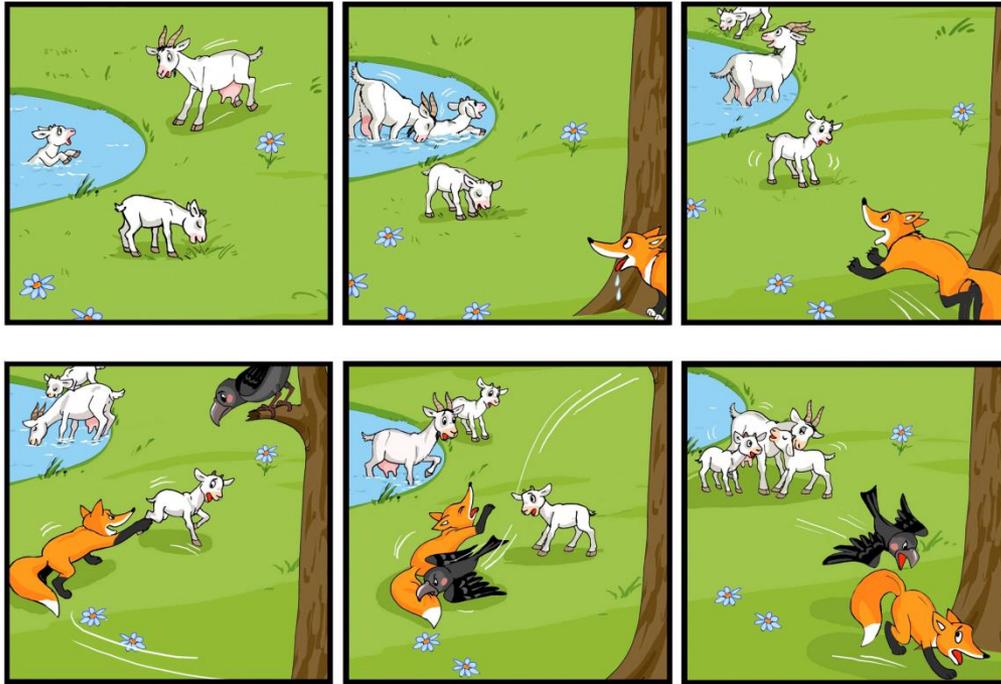
*(Tuller 2013)*

1. PaBiQ has been shown to identify bilingual children (spoken languages) with a language problem.
2. **Questionnaire use** has to be explored more with parents and teachers of deaf children.
3. Strength of identification of language problems

# Narrative and Discourse Assessment

- **LITMUS-MAIN:** multilingual assessment for testing narratives
- Common elicitation procedures and scoring schemas
- For pre-school and young school aged children (3-10 years)
- Simple 6-picture stories (much shorter than Frog Story).

# Narrative and Discourse Assessment



Six different stories  
- with several protagonists

The structure:

- something happens to a protagonist --->  
goal problem solving  
behaviour  
coupled with the result of  
problem solving

# Narrative and Discourse Assessment

- Available via COST-webpage and ZAS  
*Working Papers in Linguistics*
- Scoring system available for many spoken languages incl. English
- Not yet developed for any sign language.

# Grammar Tasks

1. Clitics
2. Case
3. Verb agreement
4. Relative clauses
5. Exhaustive Wh-questions (comprehension)
6. Sentence repetition

# Exhaustive Wh-questions



*Who is sitting where?*

# Exhaustive Wh-questions

## Single questions?

Who is sitting on a chair?

*Answer: father and grandma*

## Multiple questions

Who is sitting where?

Who is doing what to whom?

Test available in English and many other spoken languages

No test yet developed for any sign language.

# Sentence Repetition

**Sensitivity:** how many disordered children are identified as disordered ?

**Specificity:** how many non-disordered children are identified as non-disordered?

	Sensitivity	Specificity	Accuracy
<i>Sentence Recall</i>	90%	85%	88%
Non-word Repetition	78%	87%	82%
Past tense	74%	89%	80%
Third person	63%	90%	74%

as a clinical marker in English

*Conti-Ramsden, Botting & Faragher 2001*

# Sentence Repetition Task



## LITMUS-SRT

- Must use language structures that discriminate development in monolingual and bilingual settings (avoid ceiling or floor effects)
- Developed in more than 20 spoken languages

# Sentence Repetition Task

## LITMUS-SRT

Specific for the LITMUS-SRT test:

1. Sentences increase in complexity (3 levels)
2. Movement and embedding are complex in all languages
  - a. No embedding, simple canonical sentences
  - b. Simple sentences with embedding
  - c. No embedding but movement
  - d. Embedding and movement

# Sentence Repetition Task

## LITMUS-SRT

### Example of 3 levels in LITMUS – SRT- English

#### Level 1

- Simple sentences, one auxiliary or modal
- Simple sentences, het-condition
- Short actional passives
- Who/what wh-questions
- Bi-clausal sentences, coordination and complement sentences

#### Level 2

- Simple sentences, auxiliary + modal and simple negations
- Complex Negations (two auxiliary/modal + negation and Satzklammer)
- Long actional and reversible passives
- wh-object which questions, indirect object wh-questions
- Bi-clausal sentences, complement clauses and adjunct clauses

#### Level 3

- Object relative clause, right branching
- Subject relative clause, centre embedding
- Sentence with conditionals
- Object clefts with actives, subject clefts with passives
- Sentences with nouns taking complements

# Sentence Repetition Task

## LITMUS-SRT

1. Tests all linguistic levels (syntax, morphology, phonology, semantics) and phonological memory
2. Good information as a screening tool or progress tool for group results
3. Also information of strengths and weaknesses of a child.
4. Quick to administer
5. Has been developed or in development for several sign languages, e.g. ASL, BSL, DGS, NGT.

# Cross-linguistic lexical tasks

Vocabulary is very important :

- Indicator of language problems
- Predictor of reading skills
- Needs to be measured in both languages
- Bilingual norms needed

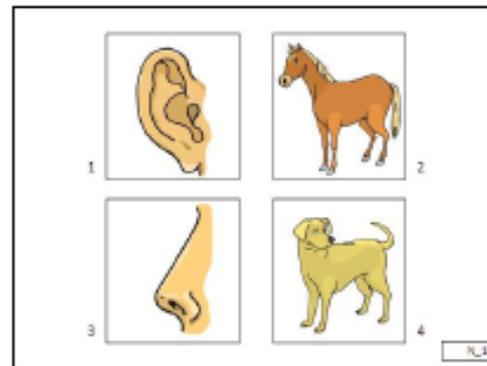
# Cross-linguistic lexical tasks

## Cross-linguistic Lexical Tasks (CLT)

picture tasks

**Comprehension: picture choice**

**Iconicity!**



**Production: picture naming**



**Versions: paper & pencil or electronic (touch screen)**

# Cross-linguistic lexical tasks

## Focus: Accuracy

Accuracy measured in lexical tasks (number of correct answers)

- Can show **language dominance** (when comparing results between the languages of the child)
- Can show **lexical deficits** in **one** or both languages (when comparing to monolingual or bilingual children)
- Can show **general language problem** if deficits in **both** languages are identified

**To what extent should bilingual/bimodal presentation be used?** *Giezen et al. In press*

# Cross-linguistic lexical tasks

## Focus: Processing

Processing speed (reaction time RT)

Restricted processing capabilities (overall *higher* RT) are attested both in bilinguals

Chen, 1990; Dijkstra, 2003; Kohnert & Bates, 2002, Bialystok, Craik, & Luk, 2008

and SLI children

Lahey, Edwards, & Munson, 2001; Lahey & Edwards, 1996; Montgomery, 2002

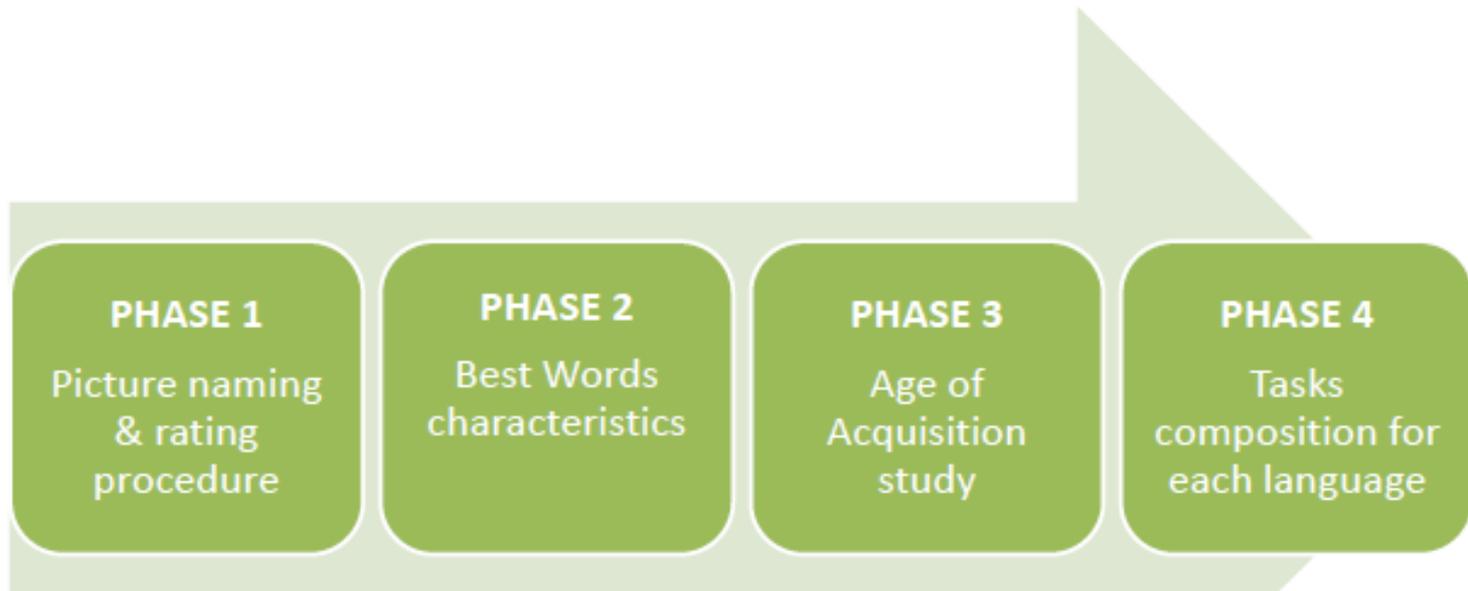
Thus, to distinguish between the effects of bilingualism vs language impairment we need to look for specific profile of **processing slow down**

→ **Relative lag between nouns and verbs** can indicate language specific problems (SLI?)

Andreu, Sanz-Torrent, & Guàrdia-Olmos, 2012

# Cross-linguistic lexical tasks

## Steps to accomplish the goal



The outcomes of PHASE 1 influenced all next phases (300 potential target words were selected shared across all languages)

# Cross-linguistic lexical tasks

Steps to accomplish the goal / 1

## PHASE 1

Picture naming &  
rating procedure

- To find out a set of words shared across all languages involved
- **To establish the most universal type of pictures**

# Cross-linguistic lexical tasks

PICTURE DATABASE

© University of Warsaw

365  
PICTURES  
+ variants

All pictures designed exclusively for CLT

- Reviewed by international panel
- Corrected



- Balanced for ethnicity & gender:  
include ethnic & gender variants



# Cross-linguistic lexical tasks

Steps to accomplish the goal / 3

**PHASE 3**  
Age of  
Acquisition  
study

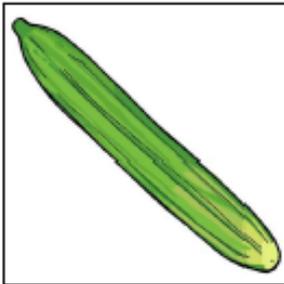
- To assess the age of acquisition of CLT-candidate words in each of the languages in a comparable way across all languages involved

# Cross-linguistic lexical tasks

## PHASE 4

Lexical tasks composition:  
Why word selection in CLT should be  
language specific?

## Example 2



### Mean AoA for CUCUMBER

Hebrew	2,08
Turkish	2,97
Polish	3,06
Lithuanian	3,28
Slovak	3,31
Lebanese	3,57
South African English	3,90
Norwegian	4,21
Afrikaans	4,37
Serbian	4,40
English	4,68
Italian	5,08
Spanish	5,20
Maltese	5,93
Catalan	7,48
Irish	10,50

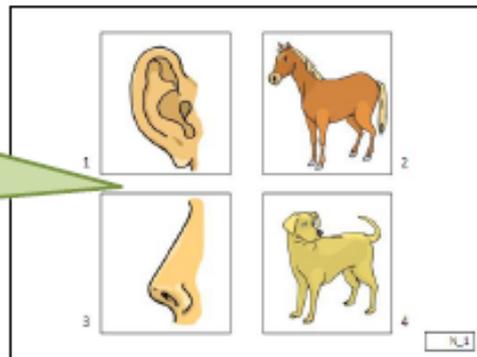
Words may differ  
significantly across  
languages in terms of  
Age of Acquisition  
(AoA)

# Cross-linguistic lexical tasks

## Cross-linguistic Lexical Tasks (CLT)

### Comprehension: NOUNS

Where is a horse?



### VERBS

Who is sweeping?



Testing time total:  
10 minutes

### Production: NOUNS

What is this?



### VERBS

What is she doing?



# Non-Word Repetition Tasks

- Construction based on the same principles for all languages.
- **Phonotactic patterns** of the target language: e.g. for English *tlup* not possible; *trup* possible.
- **Syllable length**: 1 to 6 syllables can be included. Most discrimination between 4-5 syllable words in 5 year olds.
- **Procedure**: standard presentation via computer or recorder.

# Performance on **Non-Word Repetition** as a clinical marker in English

*Conti-Ramsden, Botting & Faragher 2001*

**Sensitivity:** how many disordered children are identified as disordered?

**Specificity:** how many non-disordered children are identified as non-disordered?

	Sensitivity	Specificity	Accuracy
<i>Sentence Recall</i>	90%	85%	88%
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# Non-Word/Sign Repetition Tasks

- Non-sign tasks designed for BSL.
- Length equated with complexity of movement.
- More work needed on their discriminatory power.

# Non-Verbal Cognition Tasks

- Aim to find an area of non-verbal cognition as a marker of language impairment (independent of bilingualism).
- Multilingual children with Language impairment
  - The study of executive functions may help disentangle the effects of bilingualism and LI.

# Non-Verbal Cognition Tasks

- **Executive functions:** “processes that control and regulate thought and action” (*Freidman et al., 2006*)
- Five **main components** of executive functions are:
  - flexibility/switching
  - fluency
  - planning
  - inhibition (response inhibition and information conflict)
  - working memory *Pennington & Ozonoff (1996)*

# Non-Verbal Cognition Tasks

- **Summary of results to date:**

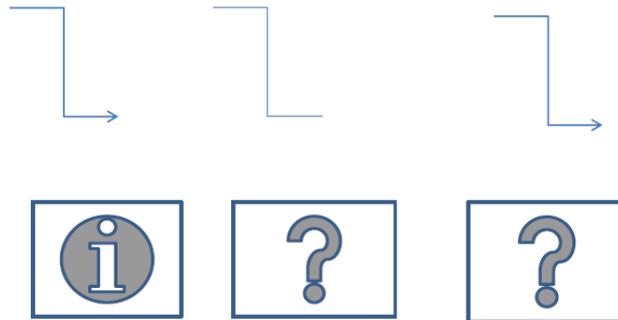
<b>Component of EF</b>	<b>distinguishes language problem?</b>
flexibility/switching	NO
fluency	YES/NO
planning	<b>YES</b>
inhibition	YES
<b>response inhibition</b>	<b>YES</b>
<b>information conflict</b>	<b>NO</b>
working memory	<b>YES/NO</b>

# Non-Verbal Cognition Tasks

- Examples of tests used:

Working Memory: visual-spatial

*Odd One out* (Henry 2001)

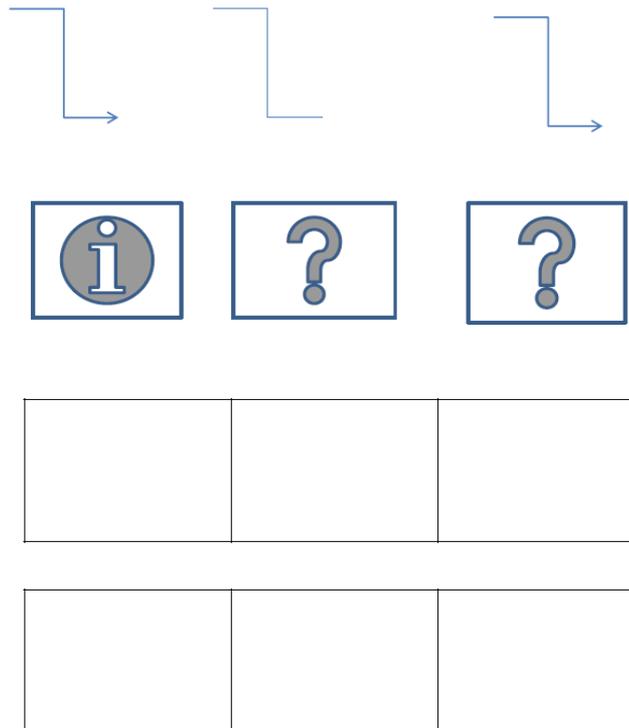


# Non-Verbal Cognition Tasks

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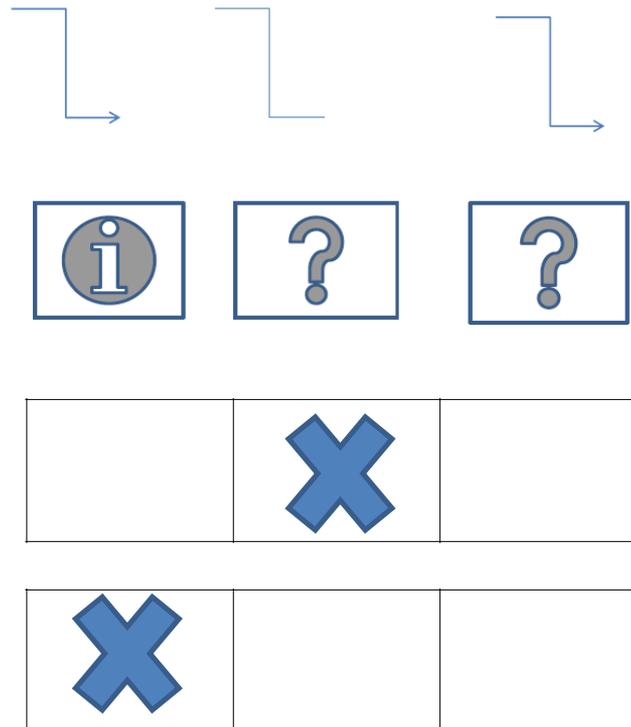


# Non-Verbal Cognition Tasks

- Examples of tests used:

Working Memory: visual-spatial

*Odd One out* (Henry 2001)



# Non-Verbal Cognition Tasks

- Examples of tests used:

Inhibition: response

*Luria Hand Fist task* (Henry et al. 2012)

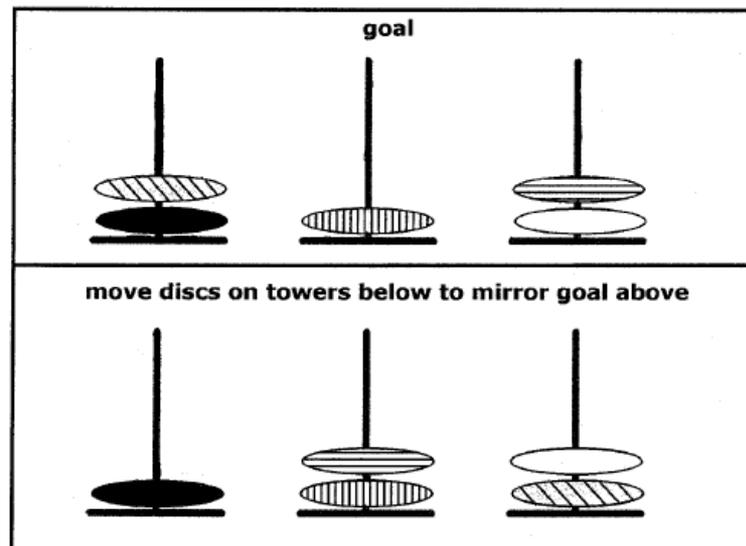
- Child 1. copies researcher: a fist or flat hand  
a point or flat hand
2. does reverse of researcher

# Non-Verbal Cognition Tasks

- Examples of tests used:

Planning:

*Tower of London task* (Philips et al. 1999)



# Non-Verbal Cognition Tasks

- **Recommendations for bimodal bilinguals**
  1. Test **response Inhibition - SLI effect.**
  2. BUT in every case the test used is crucial.
  3. Evidence of an EF weakness in a bilingual (and monolingual) child might be a clue to a language problem, but **it is not a diagnostic.**
  4. Weaknesses in EF must be taken into consideration because they affect language and nonlinguistic problem solving.

# Reflections and Summary

- Assessment of both the signed and spoken language necessary – in the child and in the input.
- Goals of assessment need to be clear.
- Non-word/sign tests and sentence repetition seem to be good investments for quick measures.

# More Information

- **COST action website:** [www.bi-sli.org](http://www.bi-sli.org)
- Including FAQ for parents and clinicians (in many languages)
- LITMUS materials will become available here
- Book *Methods for assessing multilingual children: disentangling multilingualism from language impairment*. MultiLingual Matters (due 2014)
- My contact details: a.e.baker@uva.nl





# All COST IS0804 colleagues

In particular:

Sharon Armon-Lotem (Bar-Illiel, Israel)

Shula Chiat (City, UK)

Jan de Jong (Amsterdam, Netherlands)

Ewa Hamann (Krakow, Poland)

Agnes Lukacz (Budapest, Hungary)

Petra Schulz (Frankfurt, Germany)

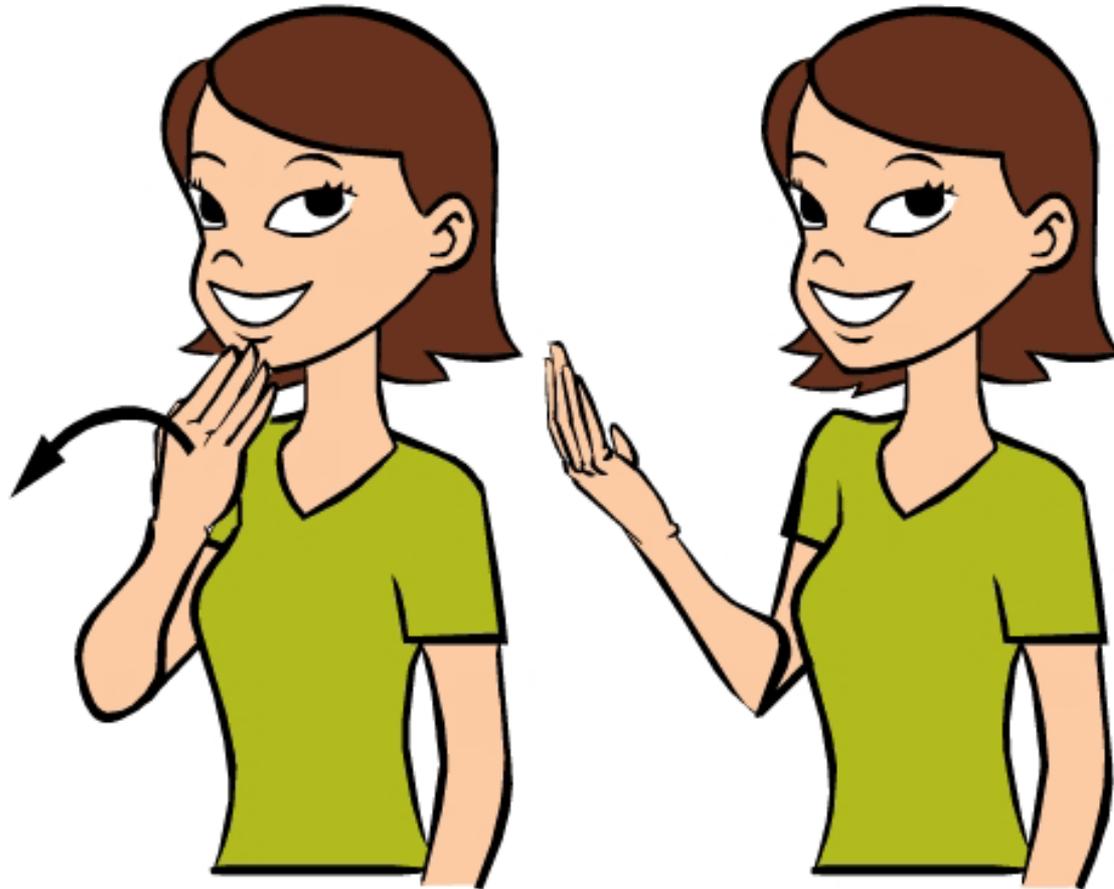
Elin Thordardottir (McGill, Canada)

Xièxiè

谢谢

Thank you

Dank je wel!





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[www.icsla2015.nl](http://www.icsla2015.nl)