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DCAL

ESRC Deafness Cognition and Language Research Centre

CITY UNIVERSITY LONDON

Sign language development, delay and disorder

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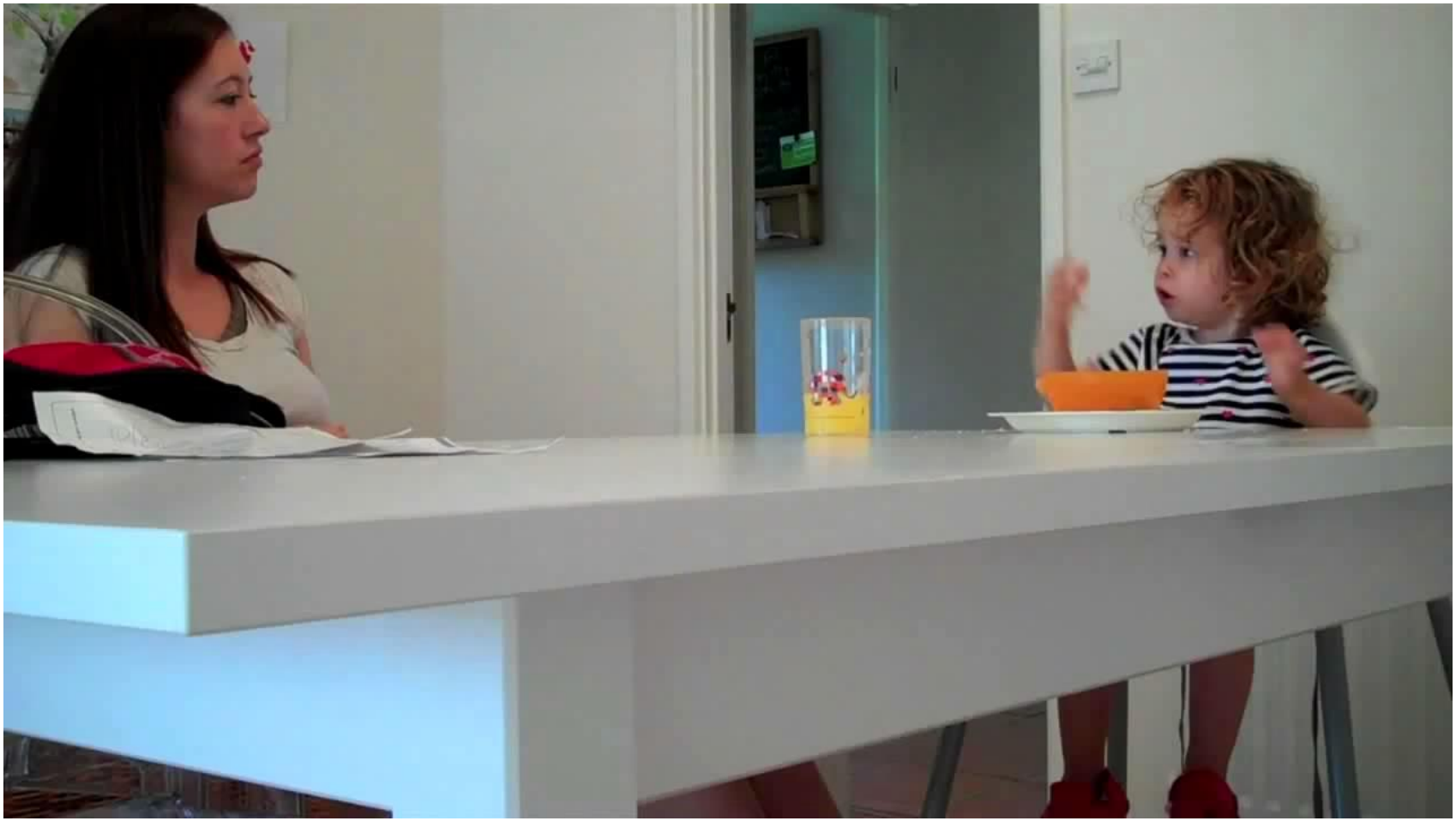
Marshall, C. & Morgan, G (2015). Investigating sign language development, delay and disorder in deaf children. In M. Marschark & P. Spencer (Eds.), *Oxford handbook of deaf studies, language, and education (3rd Edition)*. Oxford University Press.

Deaf child deaf parent (DCDP)
2 years old

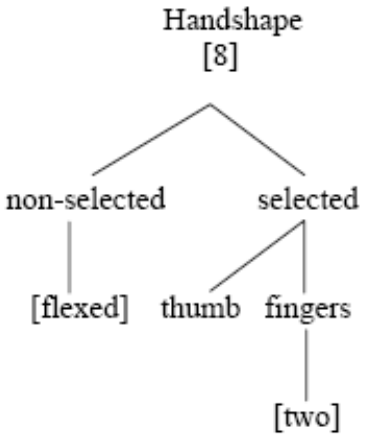


Sign structure

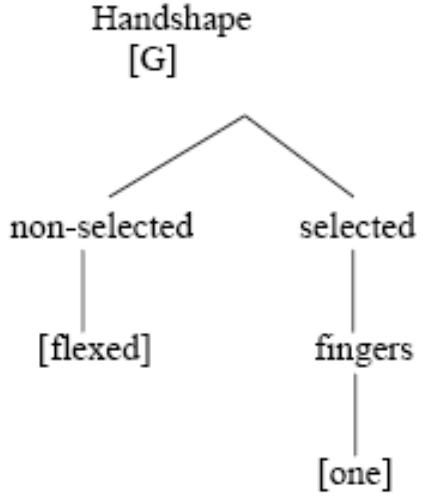
Language modality comparisons

Language development is the *same*

Target

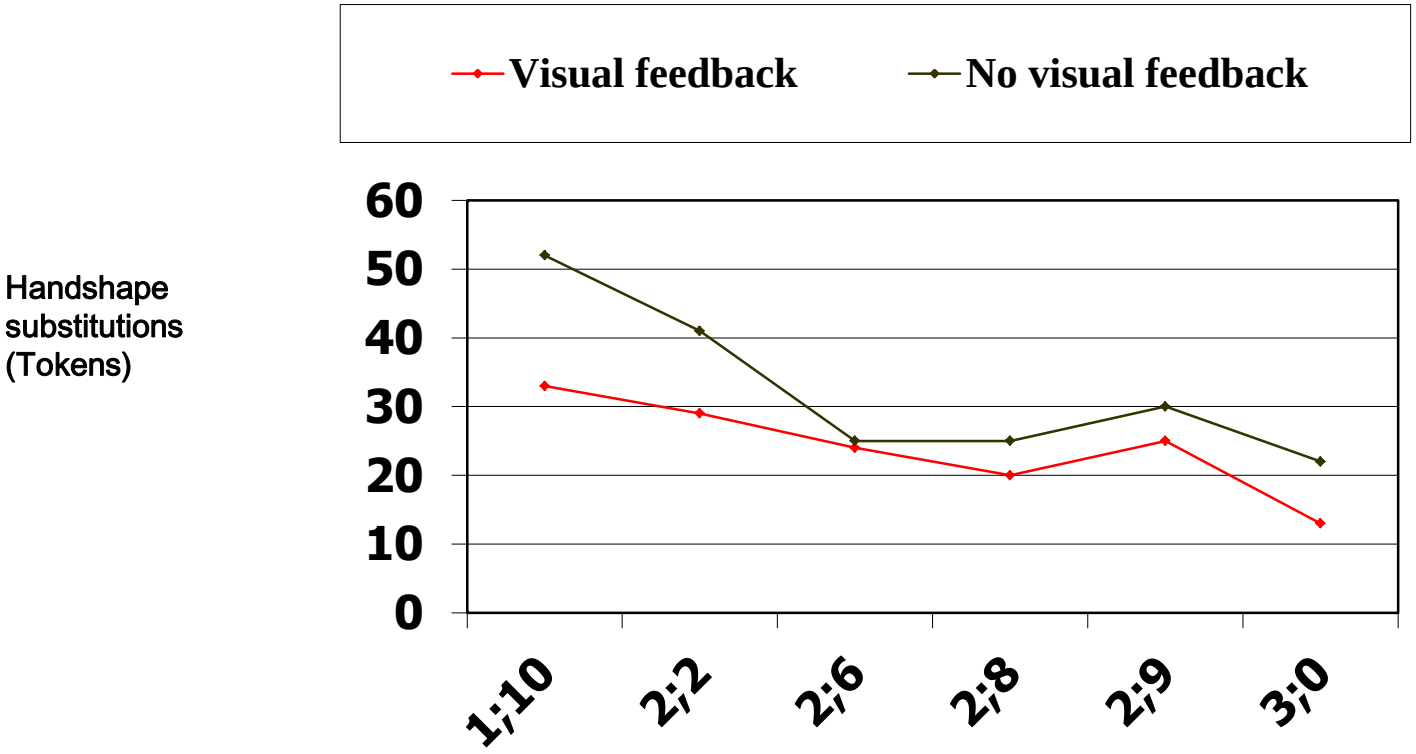


Child form



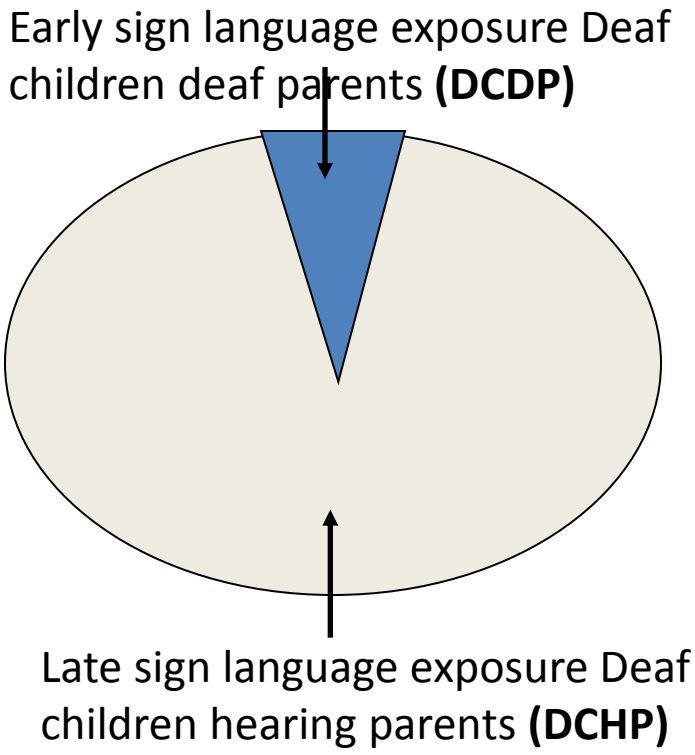
Morgan, Barret-Jones & Stoneham, 2006
Morgan, 2007

Language development is *different*



Ortega & Morgan, 2010

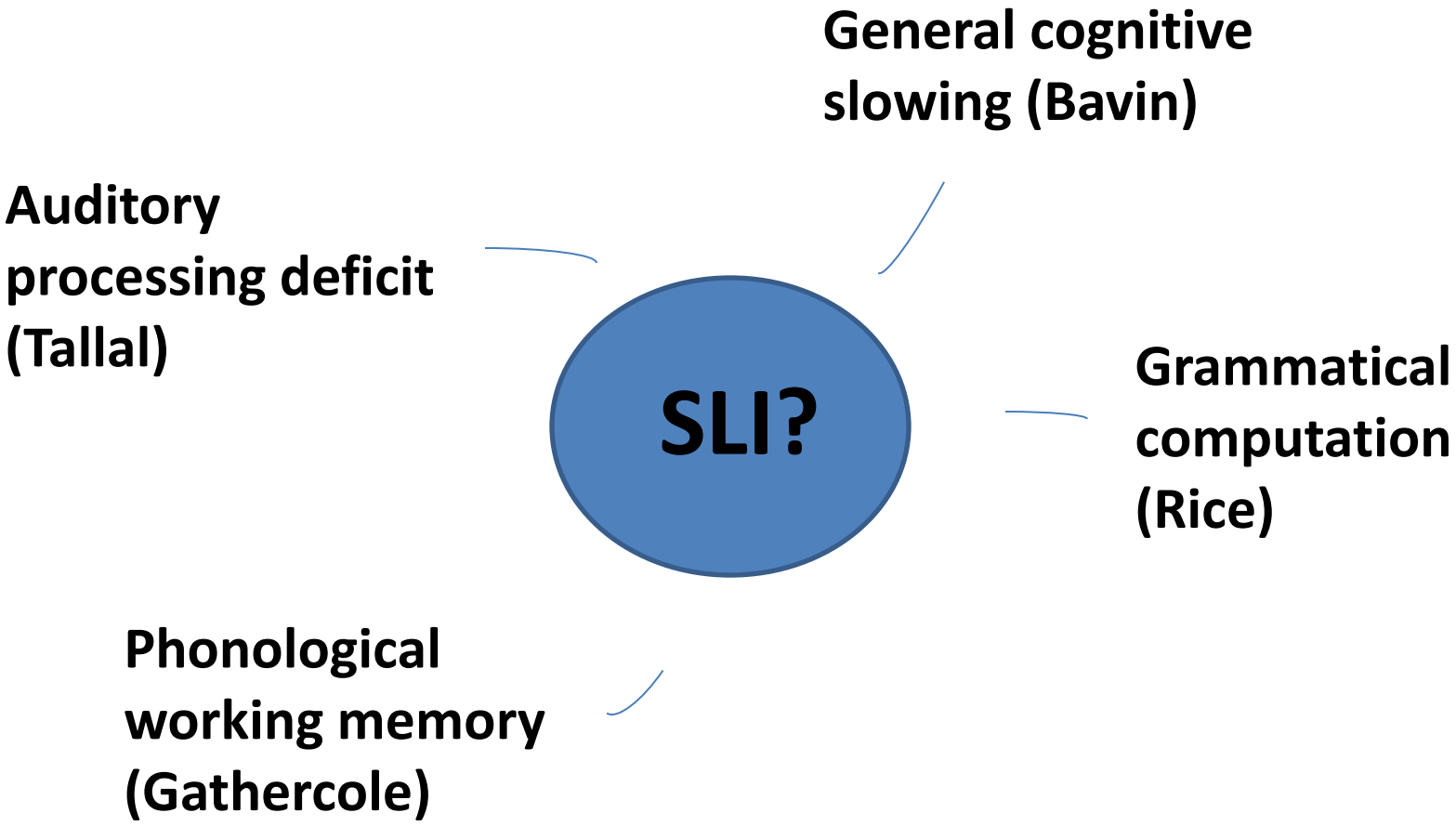
Non-native L1 acquisition



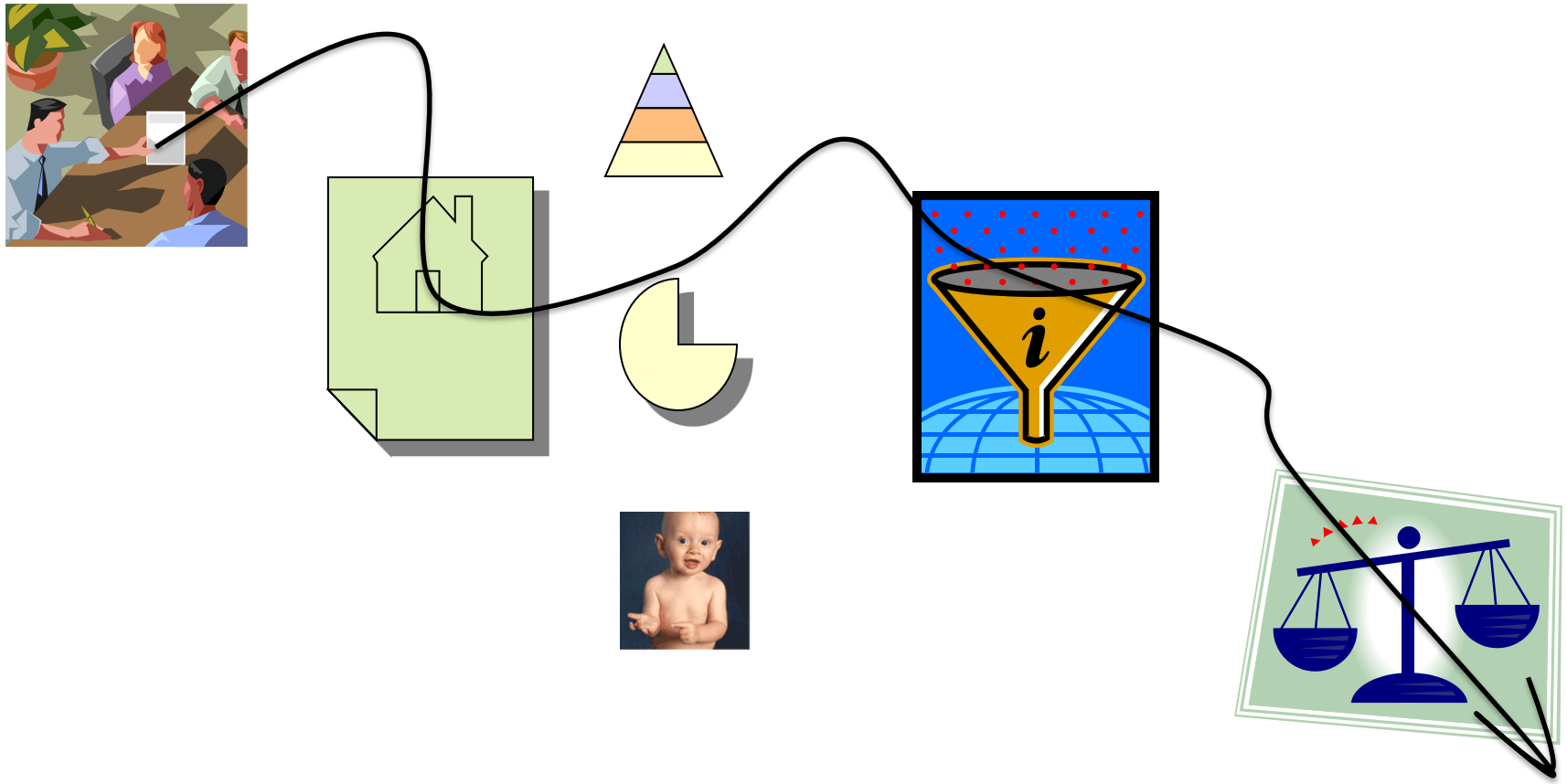
A hallmark of language acquisition is its ease and automaticity in the ***majority*** of children. Developmental Specific Language Impairment (SLI) appears in 7-10% of the hearing child population (Leonard, 1998)

The study of language acquisition has benefited from comparisons between signed and spoken language by elucidating those properties of acquisition which have their origins in the perceptual versus cognitive systems (Slobin, 1985).

When sign language development is delayed in the *typical deaf child* how do we study the potential existence of SLI in sign language development? What does SLI in sign language tell us about the disorder and its origins in general? (Morgan, 2005; Woll & Morgan, 2011).


General cognitive slowing (Bavin)
Auditory processing deficit (Tallal)
SLI?
Grammatical computation (Rice)
Phonological working memory (Gathercole)

Sign language SLI: road map



Morgan, 2005; Morgan, Herman & Woll, 2007; Marshall, Denmark & Morgan, 2007; Mason, Rowley, Marshall, Atkinson, Herman, Woll & Morgan, 2010 ; Woll & Morgan, 2011, Marshall, et al 2013

Paul

Native signer aged 5;2 at testing

Both parents are deaf, first generation signers who have communicated in BSL with Paul from birth

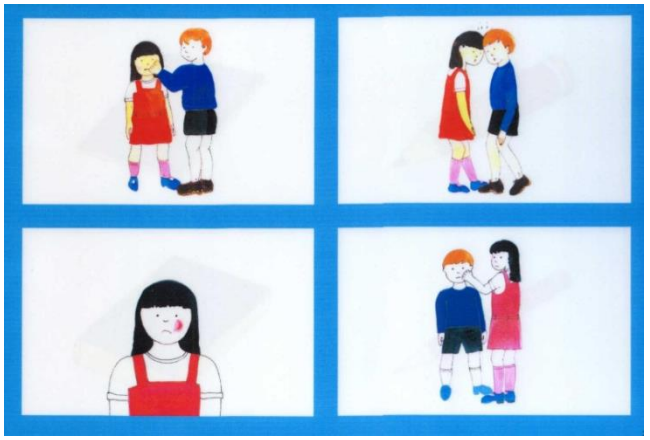
Snijders-Oomen NVIQ test at 5;0 revealed no cognitive impairments

Herman, et al, 2007

Receptive BSL vocabulary normal

BSL Receptive Grammar Test (Herman et al, 1999)

- scored 1.3 standard deviations below the mean



Sign morphology production: target picture: a man giving a boy a letter

P: GIVE GIVE SQUARE GIVE (no inflection)

A: SQUARE GIVE WHO?

P: GIVE GIVE POINT (picture) LETTER

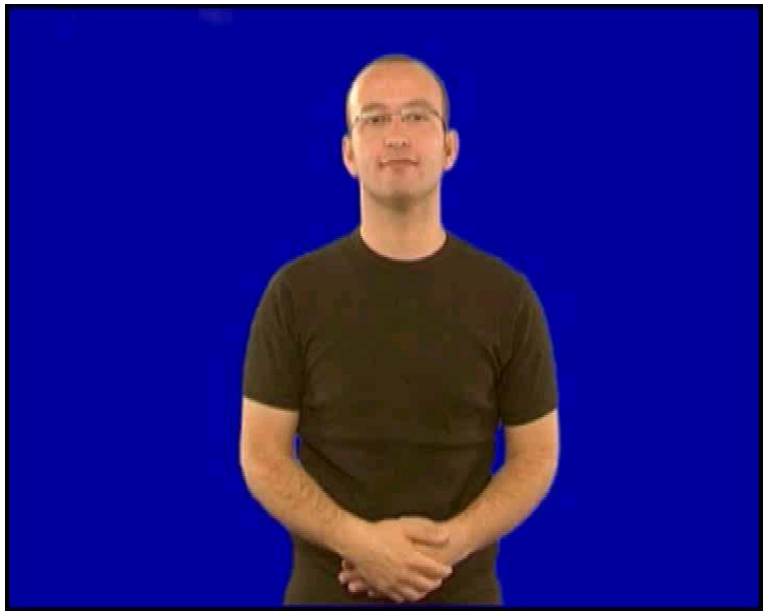
A: PICTURE WHAT?

P: LETTER POINT

Typically developing native signer aged 4;6

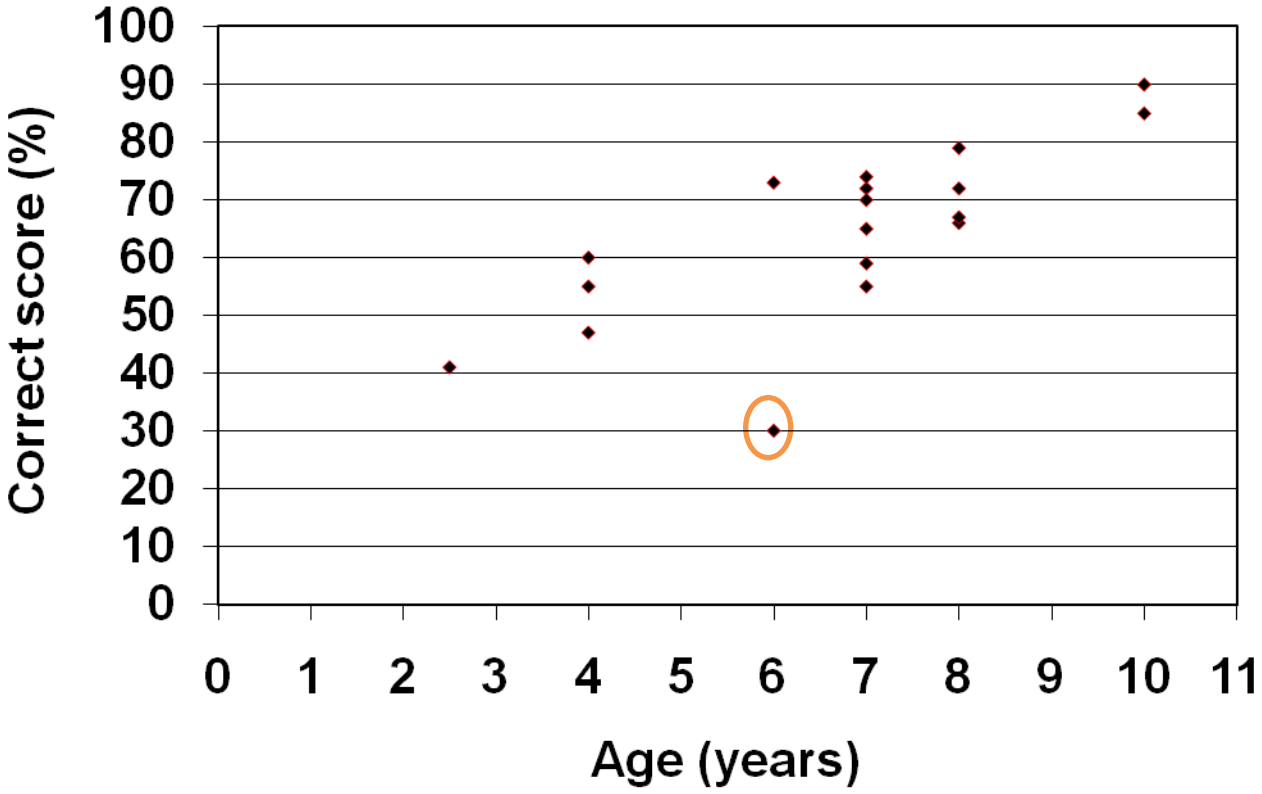
C: MAN LETTER GIVE-3

(‘the man gives the letter to (him/her)’)



(Mann et al, 2010. Nonsense sign repetition)

Paul non-sign repetition



Marshall, Denmark & Morgan (2006)

Possible sign-SLI markers?

Agreement / Classifiers - morphology

Speed in forming and accessing phonological representations

2. SLI group study

Assessments

Screening:

Age 7 years plus with minimum 4 years exposure to BSL from native models

Motor- Bead threading (motor skills)

Cognitive (British Ability Scales)

pattern construction, matrices and recall of designs

50 children

Excluded 13 children (low IQ)

Assessments completed and confirmed for 30 children

Total population contacted: diagnosis represents 6.4% with SLI

Assessments

Phonology and vocabulary:

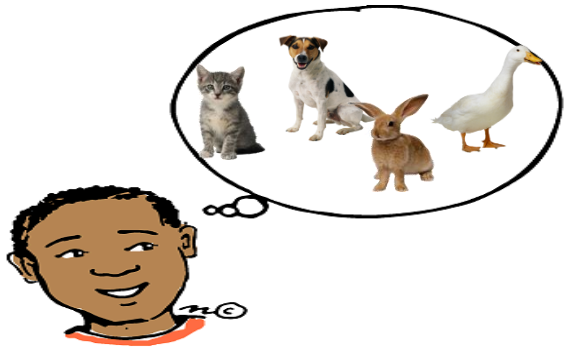
Non-sign repetition test

Vocabulary

- picture naming
- ‘definitions’ - define a sign and give an example of its use

Semantic fluency (food and animals)

“Sign as many animals as you can in a minute”



Assessments

Grammar:

Receptive Grammar - The BSL Receptive Skills Test

Signed sentence repetition test (Marshall, et al, 2013)

Productive Grammar - The BSL Productive Skills Test (narrative) Herman, et al 2004

Sign Pragmatics checklist - Conversation with a fluent BSL user and narrative production

What do sign language developmental disorders look like?

Results on standardised tests

Child	BAS z-score	BSL Receptive Test z-score	BSL production test percentile scores			Non-Sign Repetition Test z-score
			Narrative Content	Narrative Structure	BSL Grammar	
1	-0.6	0.3*	25*	50*	10*	Not available
2	-0.6	<-2.1	<10	<10	<10	-1.3
3	-0.1	1.1*	10*	10*	25*	0.5*
4	-0.9	-1.5*	10*	10*	10*	-0.1*
5	0.6	-2.1	<10	<10	<10	1.1
6	-0.7	0.1	25	10	50	-1.7
7	-1.2	<-2.1	<10	10	25	0.7
8	-1.2	0.6	<10	<10	25	-2.0
9	-0.6	-2.3	10	25	10	0.9
10	0.3	-1.5	<10	<10	<10	0.2
11	-0.5	<-2.1	<10	<10	<10	-1.4
Range	-1.2 – 0.6	<-2.1 – 1.1	<10-25	<10-50	<10-50	-2.0 – 1.1

(z ≤ -1:3; ≤10th percentile)

Mason, Rowley, Marshall, Atkinson, Woll & Morgan (2010)

7 from 13 = impaired comprehension of BSL grammar

10 from 13 = impaired production of BSL grammar

4 from 13 = impaired non sign repetition

Mason, Rowley, Marshall, Atkinson, Woll & Morgan (2010)

New studies

Semantic fluency √

Marshall et al (2012)

Sentence repetition

Narrative production

Sentence repetition is a good diagnostic assessment for SLI in spoken languages (Briscoe, Bishop & Norbury, 2001; Seeff-Gabriel, Chiat & Roy, 2008; Riches, et al 2010).

Will it be equally as impaired in sign users?

Delayed signers might fall back on gesture and pure repetition to compensate for the delayed system (Herman et al, 2007)

Participant details

SLI children: N=17; all DCHP, mean age 10yrs, 5mths, 5 years exposure to BSL.

Age matched control children N=21; all DCHP, mean age 10yrs, 9mths, 5 years exposure to BSL .

Task

20 sentences with different levels of linguistic complexity

BOOK BOY GIVE

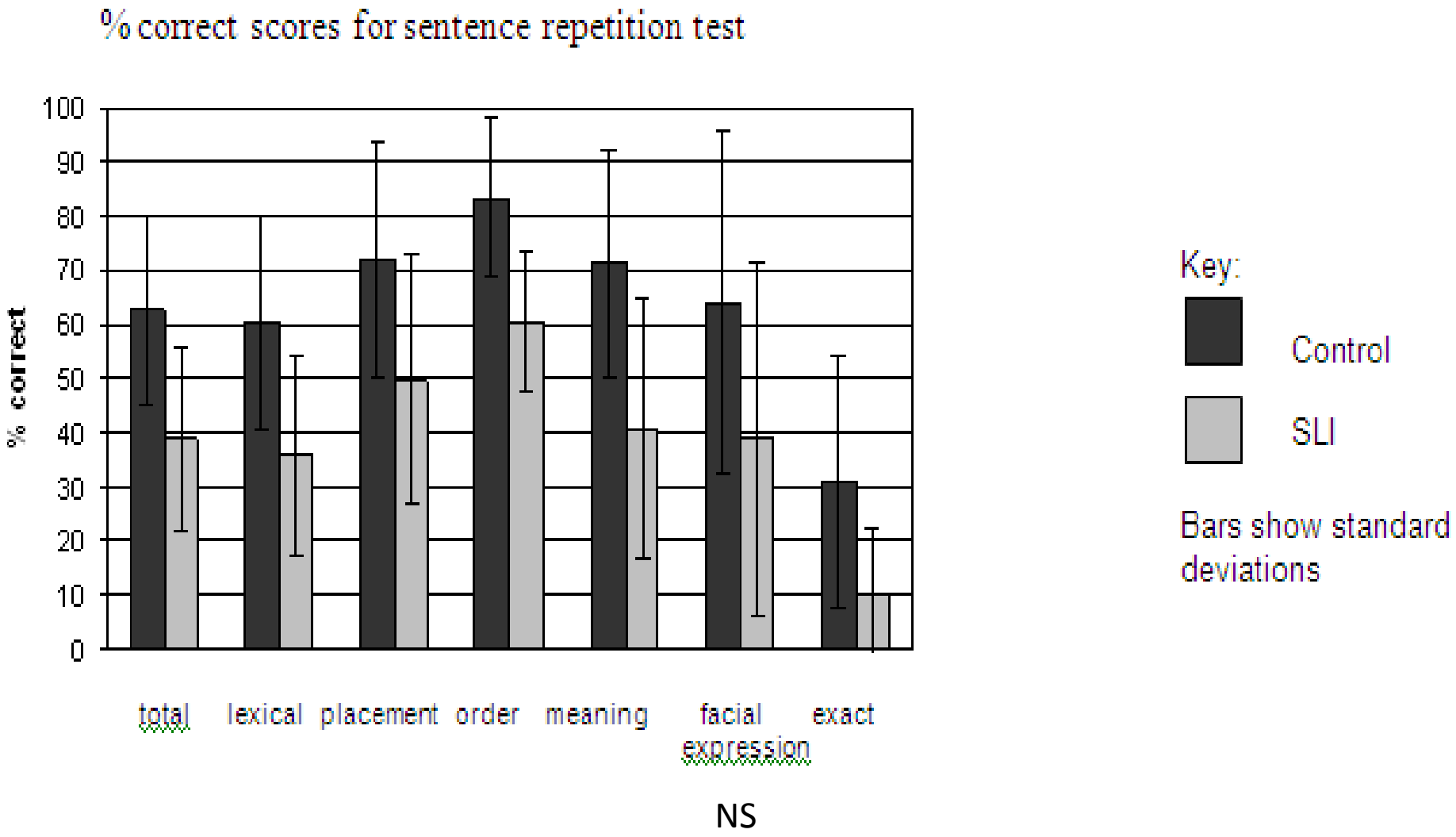
MAN WOMAN CL-WALK-TOWARDS-EACH-OTHER SEE-EACH-OTHER
WALK-AWAY

Marshall et al (2013)

5 main aspects of the test:

1. Lexical knowledge
2. Placement (morphology)
3. Order (syntax)
4. Meaning (semantics)
5. Facial expression (adverbial information)

If non linguistic gestural route is used should be **better** at placement, order and face expressions as can be accessed through iconicity rather than analyzing linguistic information



NS

Marshall et al (2013)

Narrative production

Narrative development is protracted beginning during first word combinations and with peak complexity around the ages of 10-12 years (Berman & Slobin, 1998).

Development involves coordinating: cohesion at the local level through grammatical morphology & reference and at the global level with connectives, anaphora and pragmatics

Narrative tests used to identify children with SLI in spoken languages (e.g. Botting 2002, Norbury and Bishop, 2003).

SLI children's performance similar to younger typically developing children with delays at local and global levels.

Participant details

SLI children: N=17; 2 DCDP, 15 DCHP, mean age 10yrs, 5 years exposure to BSL.

Age matched control children N=21; 2 DCDP, 15 DCHP, mean age 10yrs, 5 years exposure to BSL .

Task

Recall non-verbal narrative after viewing on video

Standardized assessment with norms (*Herman, et al, 2004).*

Herman, Rowley, Mason & Morgan (2013)

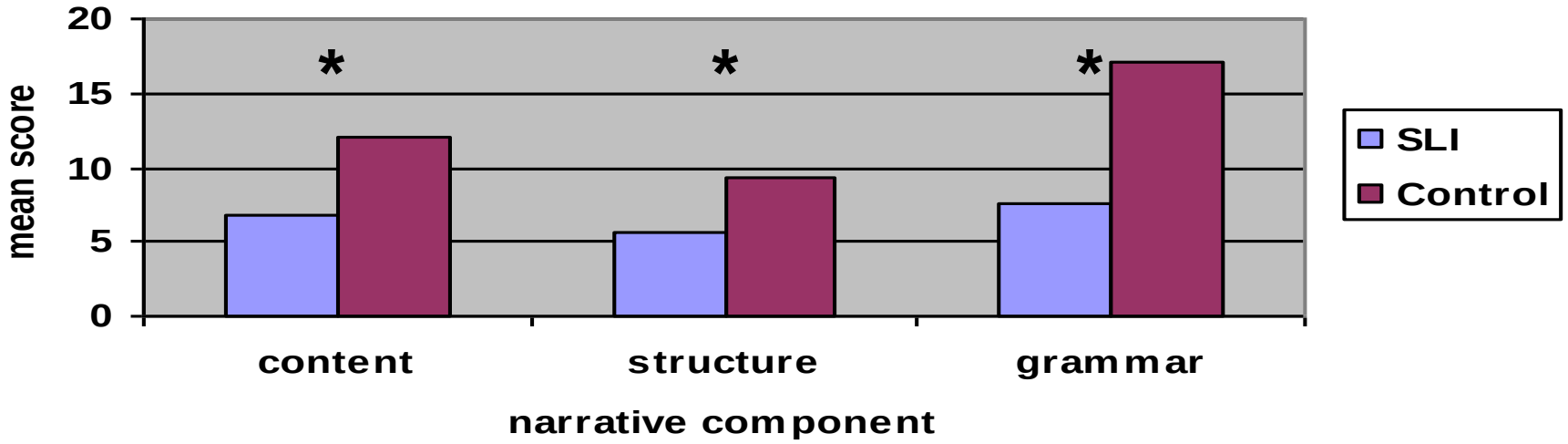
Test scored for three components:

1. Information
2. Structure
3. Grammar

Children with limited language exposure can remember concept of time and passage of events without use of formal linguistic devices (Morford, 1996; Goldin Meadow, 2003)

If SLI children can compensate for the language impairment the global components of: Information and Structure **better** than local grammatical components.

Results



Story content/structure:
SLI group told shorter stories than TD
SLI group frequently omitted the main theme (Climax) and Resolution in contrast to TDs
SLI made more errors in sequencing

(Herman, Rowley, Mason & Morgan, 2013)

Conclusions so far:

Some deaf children have sign language impairment: different intervention from cases of delay

Auditory processing of signal not the issue for SLI in sign language

Sign SLI is heterogeneous but in same ways as spoken language SLI

Error patterns are characteristic of younger children rather than deviant errors

Single signs and sign phonology are not universally impaired (Marshall, Mann & Morgan, 2011)

Spoken English SLI?

What next?

‘I read this research and I think “what do I do with this now?”….I read those articles and I think how can I use that? ….I need someone to say. So that means you’ve then got to do this. And if you do that, that’ll be the outcome’.

SLT London

First forays into sign language therapy for deaf children with SLI

Joanna Hoskin (Springfield Hospital London CAMHS deaf services)

How do Deaf practitioners work with Deaf young people who have language difficulties?

Can language therapy strategies/resources developed for spoken language be adapted or developed, with Deaf colleagues, to provide language therapy in BSL?

Can therapy bring observable change to Deaf practitioners' therapeutic skills? (evaluation of Deaf adults in therapeutic interventions with Deaf children)

Funding:

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

The Leverhulme Trust

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European Commission Research & Innovation

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