

Positive Support: A UK study of deaf children and their families: early language measures

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Positive Support

- Parent-led monitoring of key outcomes for deaf children in the first years of life
- Relating these to type and extent of specific interventions
- Key outcomes
 - Language
 - Communication
 - social behaviour
 - Family functioning
 - motor and physical development

Outline

- Introduction to CDI
- Creation and Standardisation of BSL CDI
- Using the BSL and English CDIs
- Initial findings

Background to the CDI

- a psychometrically robust parent report tool developed to assess early child language.
- parents indicate vocabulary production and comprehension by ticking items on a list of words grouped into categories such as 'animals', 'toys' and 'actions'
- Also includes markers of grammatical development

Properties of the CDI

- Psychometric properties (including internal reliability and concurrent validity) were calculated for the original American English CDI (Fenson et al., 1994, pp. 67-76)
- translated and adapted into many languages
- widely used in educational and clinical settings
 - Children with ASD
 - children with developmental language disorders
 - deaf children (including those with cochlear implants)

Using the CDI with deaf children

- Mayne et al. (2000): English norms for deaf and hard of hearing children in the Colorado Hearing Intervention Programme
 - Norms for expression and comprehension from checklists completed by hearing parents of deaf and hard of hearing children (age range 8-37m)
- Anderson & Reilly, 2002) ASL version of the CDI based on deaf children of deaf parents

Families in BSL CDI standardisation

- 30 deaf native signers (all British white)
 - 2 with hearing mothers who were fluent signers and deaf fathers
 - 28 with deaf mothers
 - 18 boys (95 sets of data) and 12 girls (58 datasets)
 - 2% first generation native signers (hearing grandparents)
 - 45% second generation native signers (Deaf grandparents as well as Deaf parents)
 - 52% with more than 3 generations of Deaf
 - broad distribution of parental occupation (British Standard Occupational Classification (2000))

Final checklist: 569 items in 22 categories

- The entire checklist is available in BSL on the project website
 - to clarify the intended meaning of the English words used on the checklist
 - to give examples of the BSL signs
- The list has also since been widely used by hearing parents, teachers and therapists

<http://www.ucl.ac.uk/HCS/research/EBSLD/>

Sample of the BSL CDI on the website

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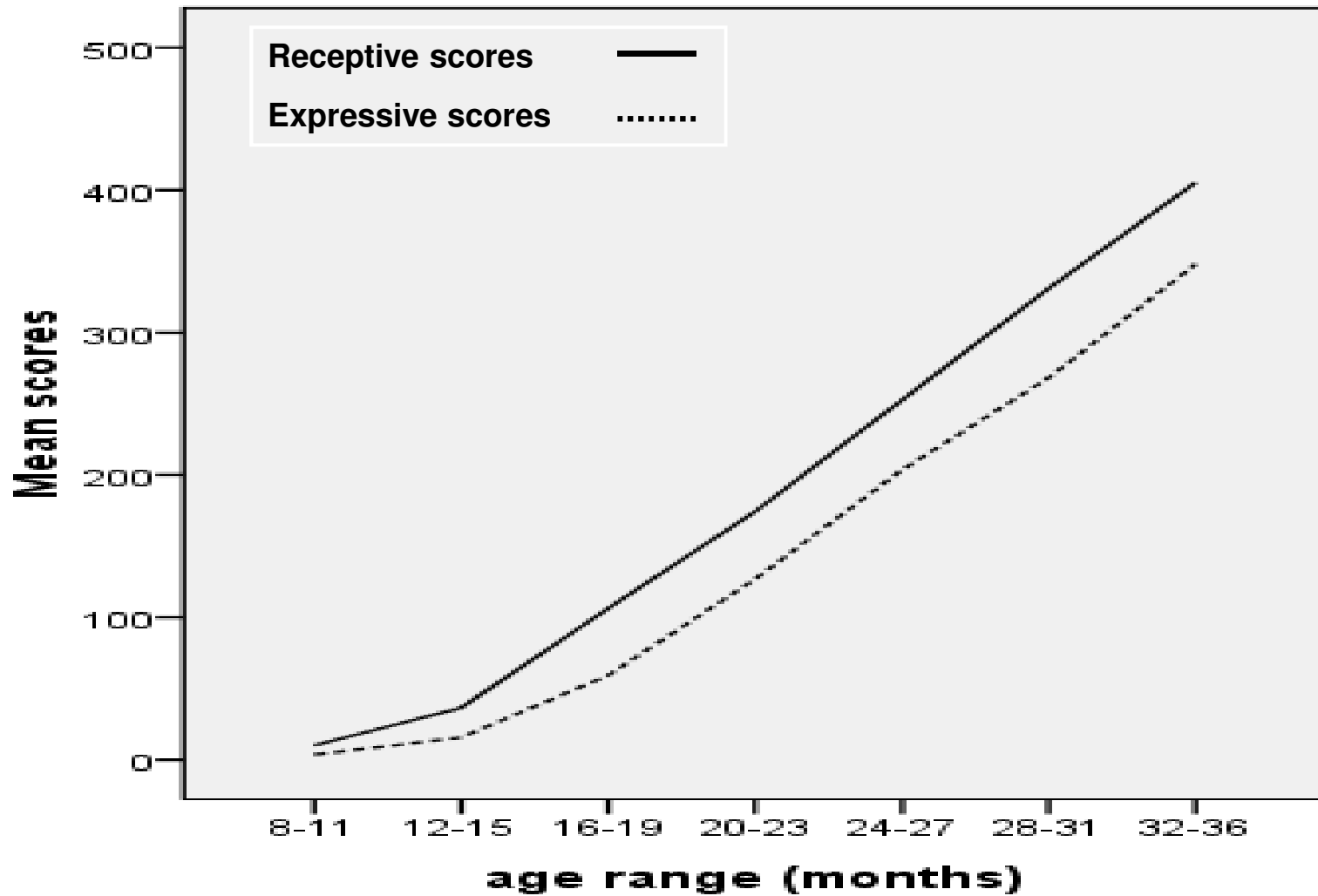
Sample checklist category: People

PEOPLE (U – UNDERSTANDS, S = SIGNS)								
	U	S		U	S		U	S
1. aunt	<input type="checkbox"/>	<input type="checkbox"/>	12. doctor	<input type="checkbox"/>	<input type="checkbox"/>	23. people	<input type="checkbox"/>	<input type="checkbox"/>
2. baby	<input type="checkbox"/>	<input type="checkbox"/>	13. fireman	<input type="checkbox"/>	<input type="checkbox"/>	24. people	<input type="checkbox"/>	<input type="checkbox"/>
3. babysitter	<input type="checkbox"/>	<input type="checkbox"/>	14. friend	<input type="checkbox"/>	<input type="checkbox"/>	25. pet's name	<input type="checkbox"/>	<input type="checkbox"/>
4. babysitter's name	<input type="checkbox"/>	<input type="checkbox"/>	15. girl	<input type="checkbox"/>	<input type="checkbox"/>	26. police	<input type="checkbox"/>	<input type="checkbox"/>
5. boy	<input type="checkbox"/>	<input type="checkbox"/>	16. grandma	<input type="checkbox"/>	<input type="checkbox"/>	27. Father Christmas	<input type="checkbox"/>	<input type="checkbox"/>
6. brother	<input type="checkbox"/>	<input type="checkbox"/>	17. grandpa	<input type="checkbox"/>	<input type="checkbox"/>	28. sister	<input type="checkbox"/>	<input type="checkbox"/>
7. child's own name	<input type="checkbox"/>	<input type="checkbox"/>	18. Indian	<input type="checkbox"/>	<input type="checkbox"/>	29. teacher	<input type="checkbox"/>	<input type="checkbox"/>
8. child/kid	<input type="checkbox"/>	<input type="checkbox"/>	19. postman	<input type="checkbox"/>	<input type="checkbox"/>	30. uncle	<input type="checkbox"/>	<input type="checkbox"/>
9. clown	<input type="checkbox"/>	<input type="checkbox"/>	20. man	<input type="checkbox"/>	<input type="checkbox"/>	31. woman	<input type="checkbox"/>	<input type="checkbox"/>
10. cowboy	<input type="checkbox"/>	<input type="checkbox"/>	21. mummy	<input type="checkbox"/>	<input type="checkbox"/>			
11. daddy	<input type="checkbox"/>	<input type="checkbox"/>	22. nurse	<input type="checkbox"/>	<input type="checkbox"/>			
Other words								

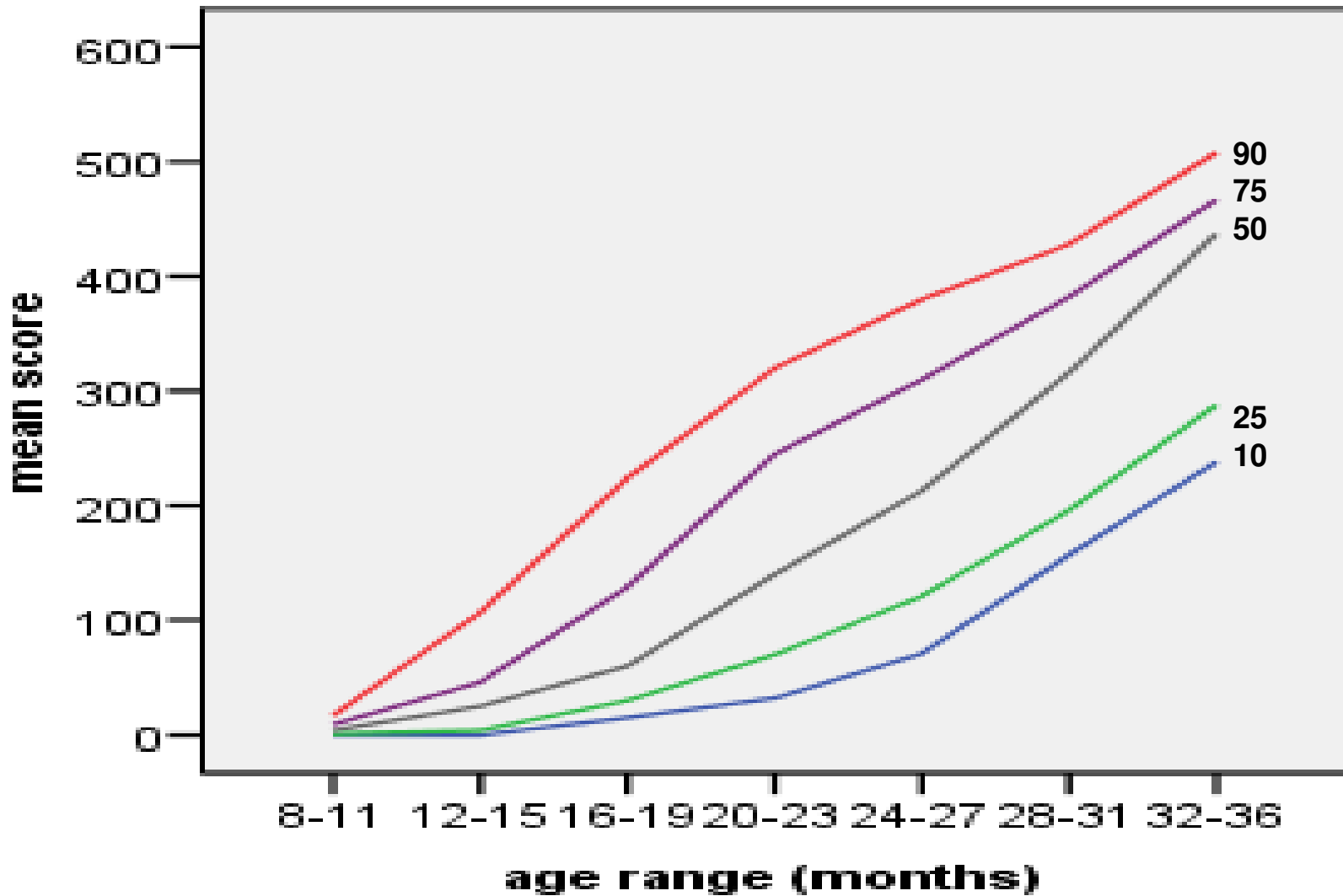
Results of 153 data sets from 30 deaf native signers

- Data divided into 4-month age bands
- number of data sets per child varied from 2-7
- number of entries across the age groups varied from 16-29
- 2 children excluded because of inconsistent data entries
- 20 items removed because they were selected by 3 or fewer participants in either the receptive or expressive scale

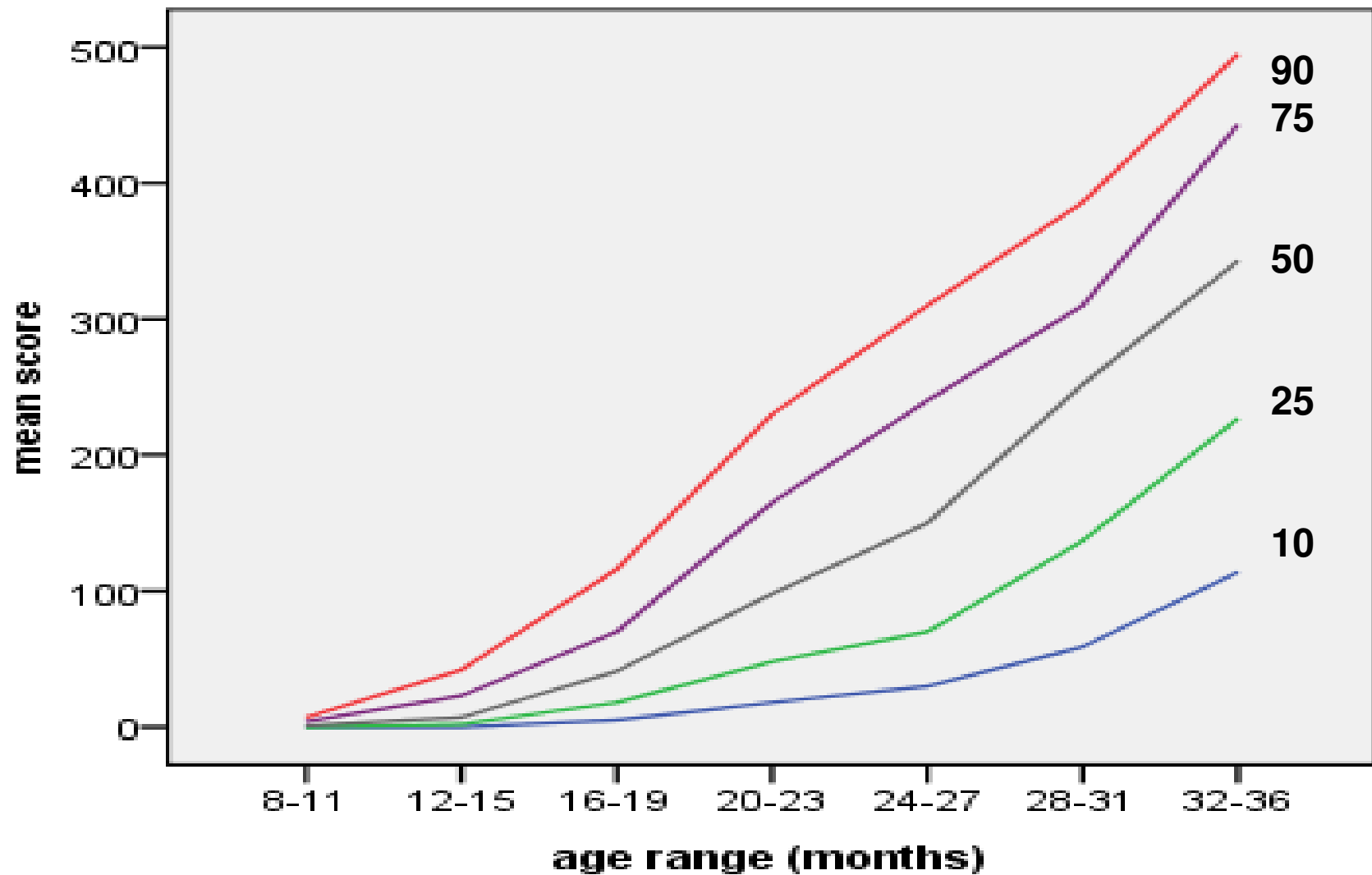
Mean scores x age



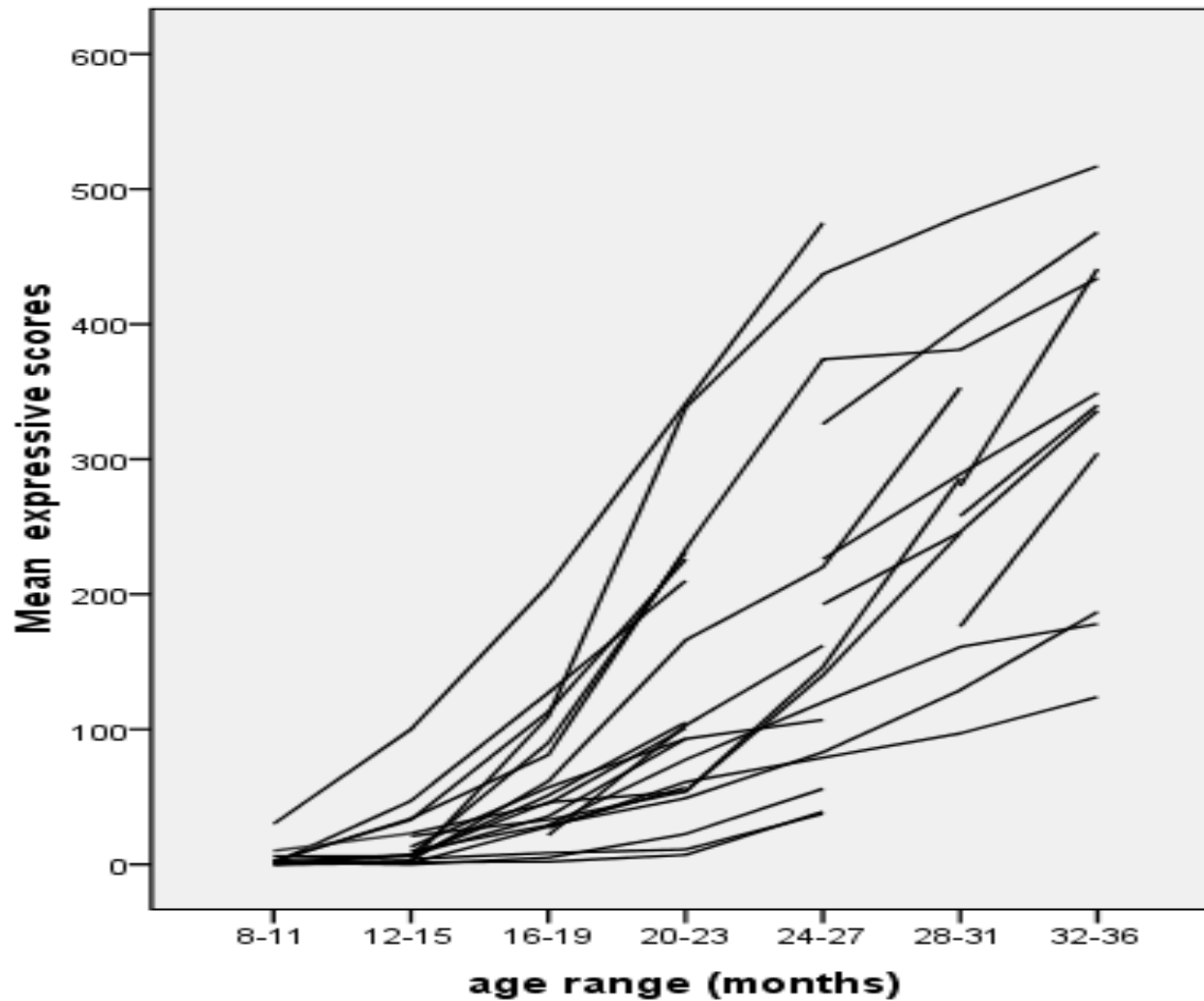
Percentiles: Receptive



Percentiles: Expressive



Individual growth trajectories



Notes of caution

- The percentiles are based on 4-month age bands, which are fairly broad groupings for handling data of this sort
- For the youngest groups a small increase in raw scores can lead to large changes in percentile scores (for children in the age band 8 -11m, only 9 signs separate the 10th and 75th percentiles)

Applying the BSL CDI to children in the Positive Support Project

Use with the Positive Support Sample

- English language (Oxford CDI – standardised on British English children)
- BSL CDI
- One or both completed by parents when children reached 24m or at end of project (if child less than 24m)

Current analyses 1: English

- Comparison of Positive Support children with English-speaking norms in hearing children
- The relationship between receptive and expressive language in English
- The relationship between age at diagnosis and English

Current analyses 2: BSL

- Comparison of Positive Support children with native signer norms
- The relationship between receptive and expressive BSL

Current analyses: bilingual children

- Comparing language development in English and BSL
- Effect of degree of hearing loss on BSL and English language development
- Comparing vocabularies in English and BSL

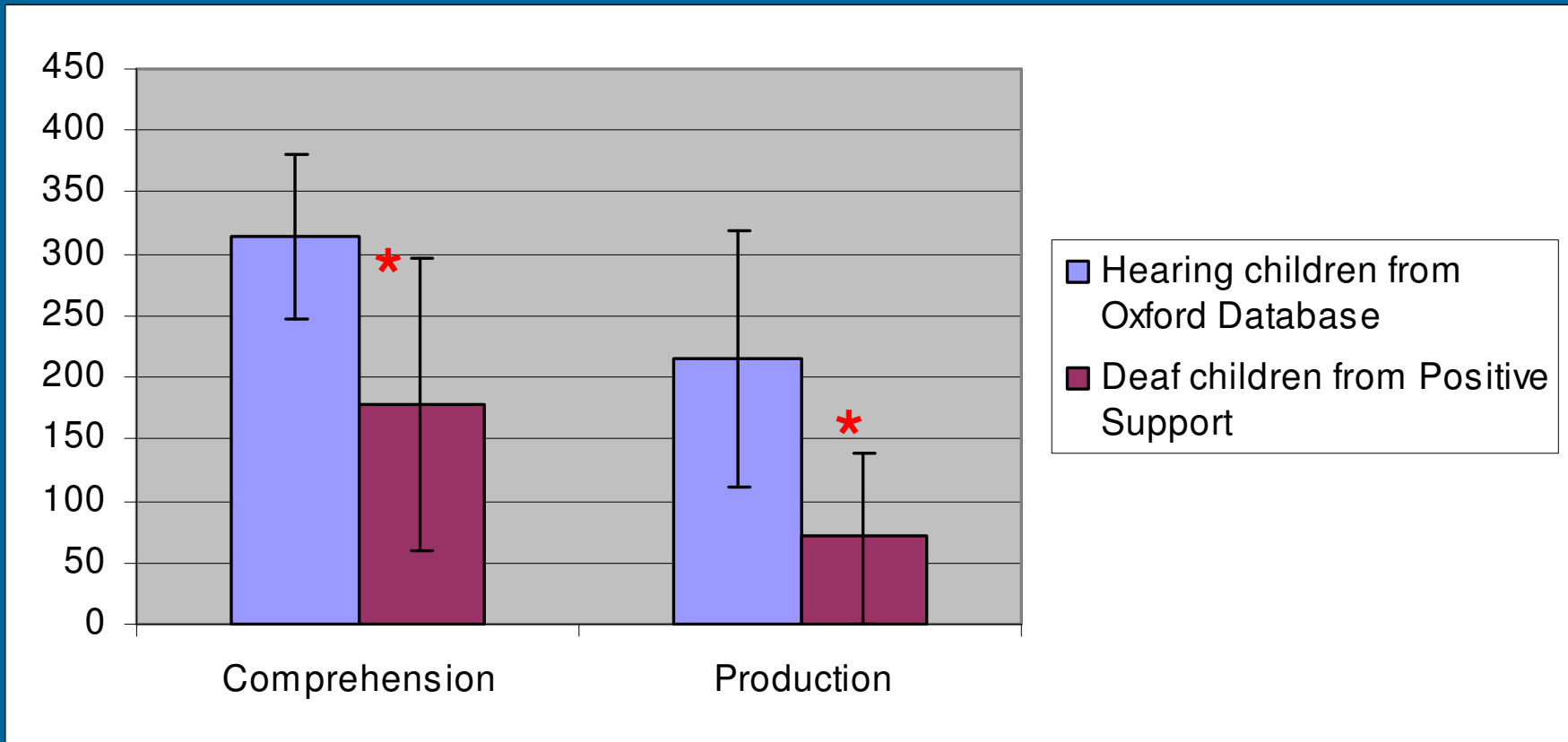
Data

- 84 questionnaires - 46 English, 38 BSL
- Comprising 61 children (mean age 21.4m)
 - 20 children with both English and BSL CDIs (22.0 m)
 - 23 English CDI only (20.9 m)
 - 18 BSL CDI only (21.4 m)
- 17 excluded
 - 4 blank BSL CDI, 5 blank English CDI
 - 4 BSL CDI from children not meeting study criteria
 - 4 English CDI from children not meeting study criteria
- The number of BSL CDIs completed far exceeds our prior estimates of young children using BSL

24m group

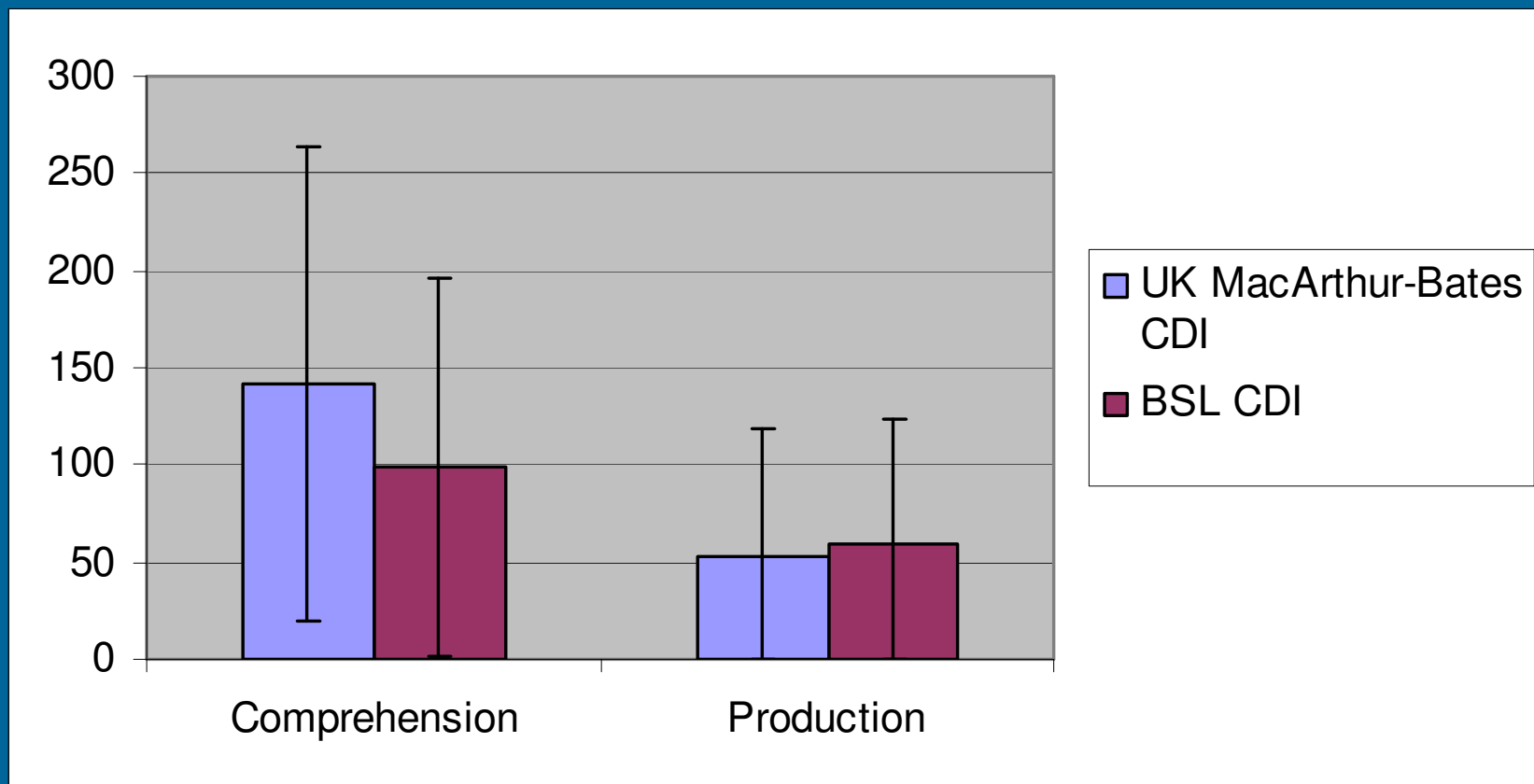
- 37 children at 24m:
 - 53 questionnaires
 - 29 English
 - 24 BSL
 - 16 children with English and BSL CDIs
 - 13 children with English CDI only
 - 8 children with BSL CDI only

English in 29 children aged 24m



* Significant differences between hearing and deaf children ($p < .001$) in both Comprehension and Production as assessed through English CDI

English and BSL in 16 bilingual children aged 24m

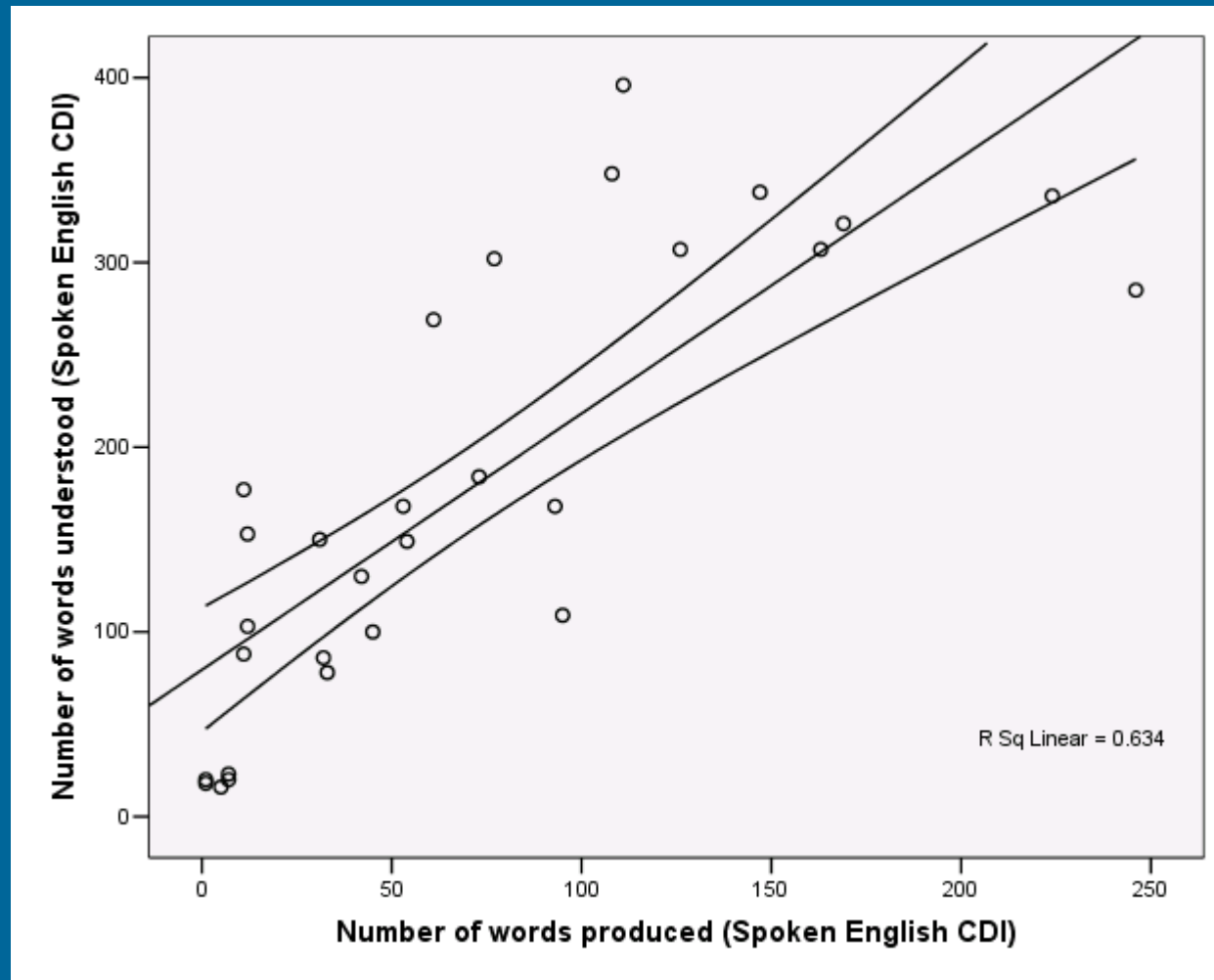


No significant differences between English and BSL skills in either Comprehension or Production

Analysis of children aged 24m

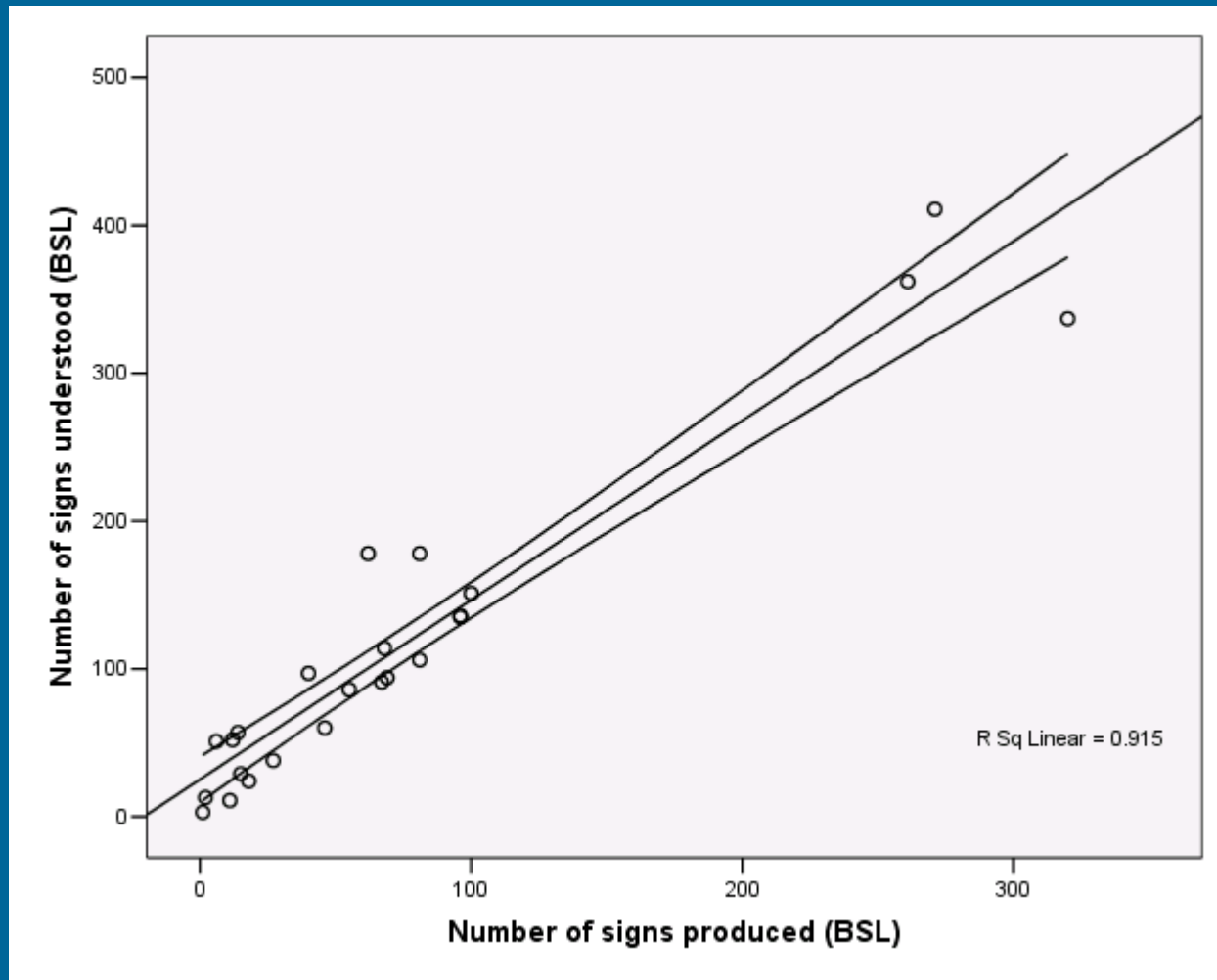
Correlations among linguistic
variables

Correlation between Comprehension and Production: English



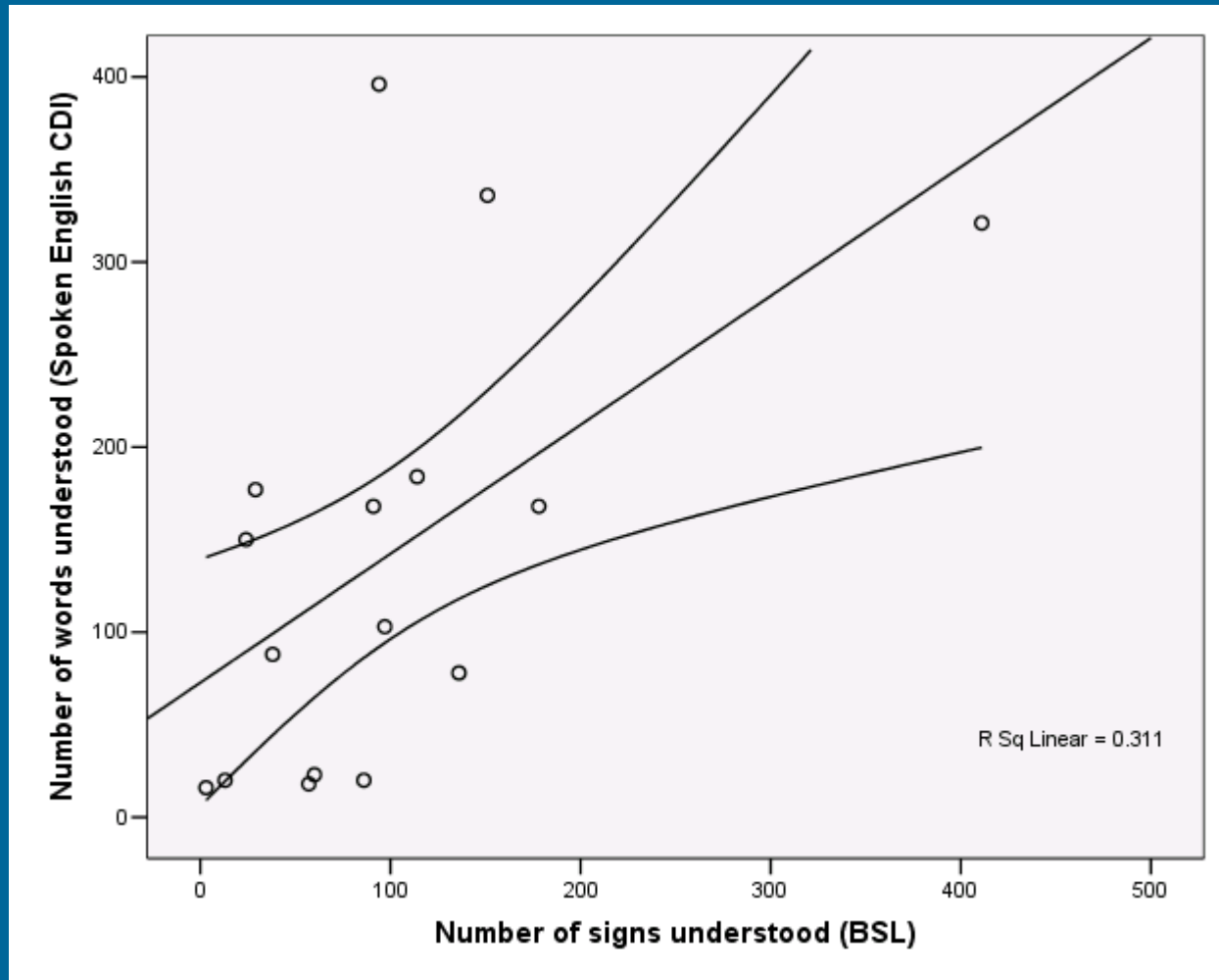
There is a significant correlation between Comprehension and Production ($r=+.80$; $p<.001$).

Correlation between Comprehension and Production: BSL



In BSL there is a closer significant correlation between Lexical Comprehension and Lexical Production $r=+.96$; $p<.001$. This is a nearly perfect correlation.

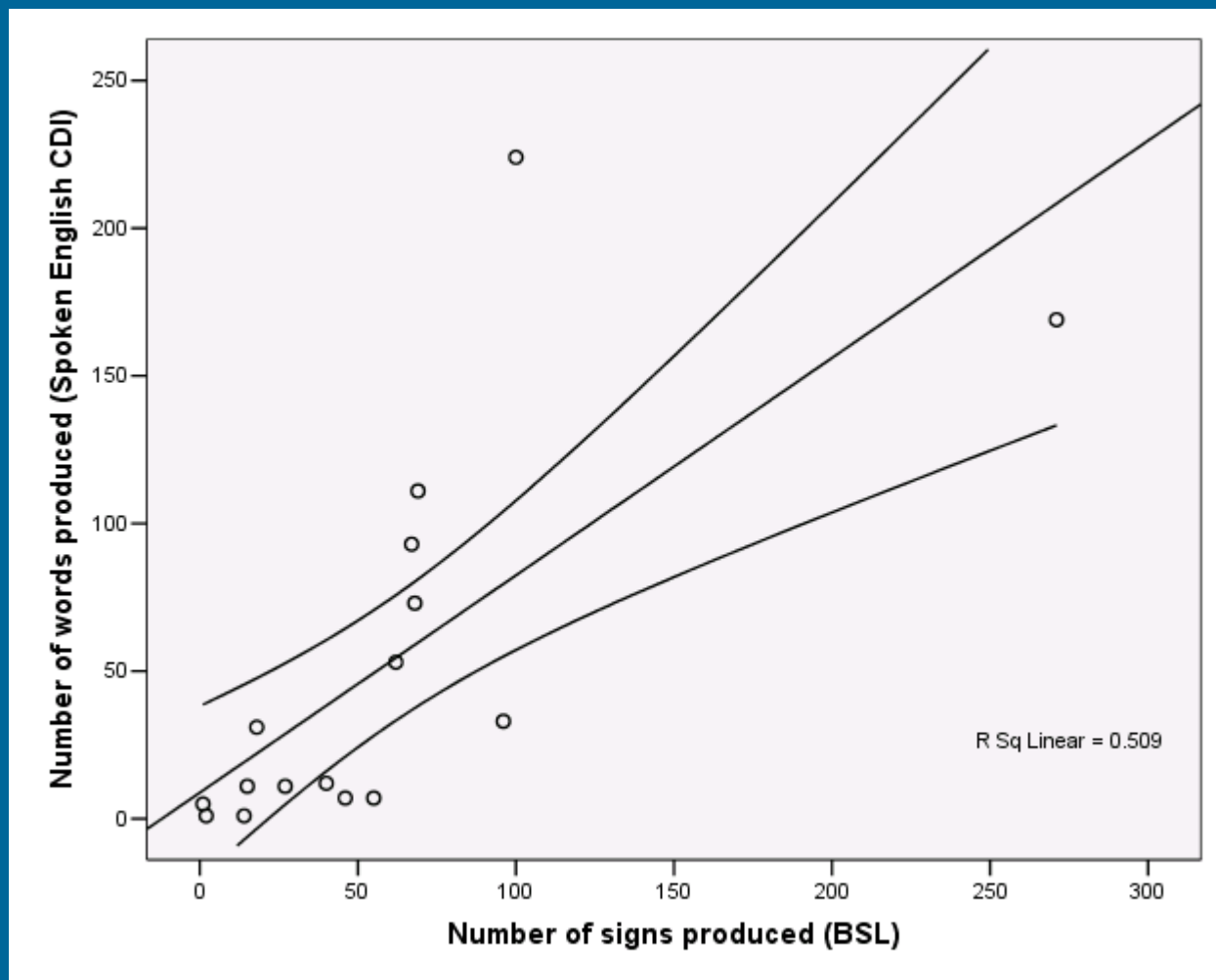
English and BSL comprehension compared



Children who understand more English lexical items, also understand more BSL lexical items. English and BSL comprehension go together ($r=+.56$; $p<.05$)

English and BSL production compared

Overall
Production:
English and
BSL CDIs

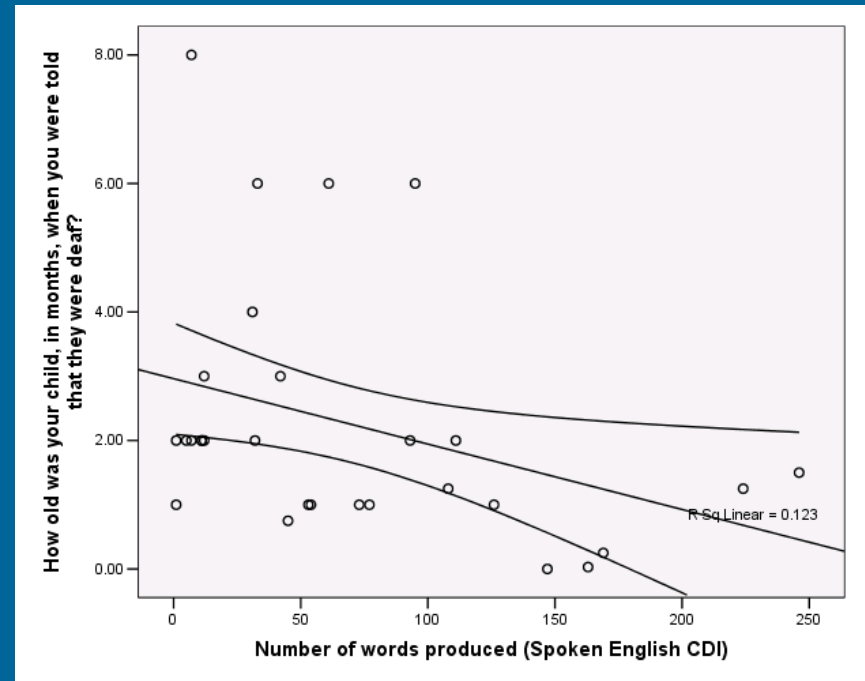
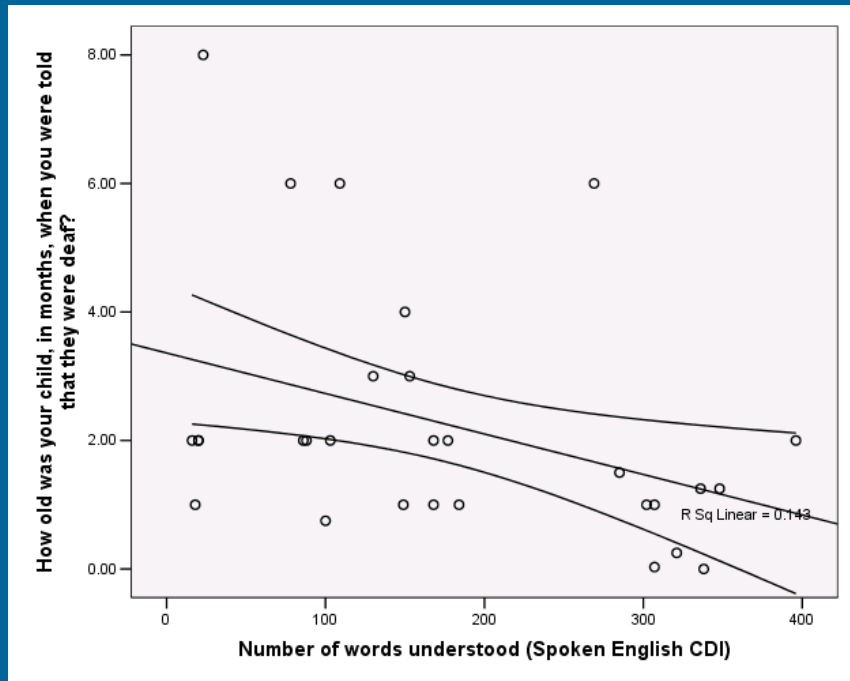


As with comprehension, children who produce more English lexical items, produce more BSL lexical items. English and BSL production go together ($r=+.71$; $p<.01$)

BSL –CDI data: monolingual and bilingual children

- Children show a significant correlation between BSL vocabulary size and the presence of combinations of signs forming sign phrases ($r=+.65$; $p<.001$).
- All children who use combinations of signs have at least 40 signs in their productive vocabulary.

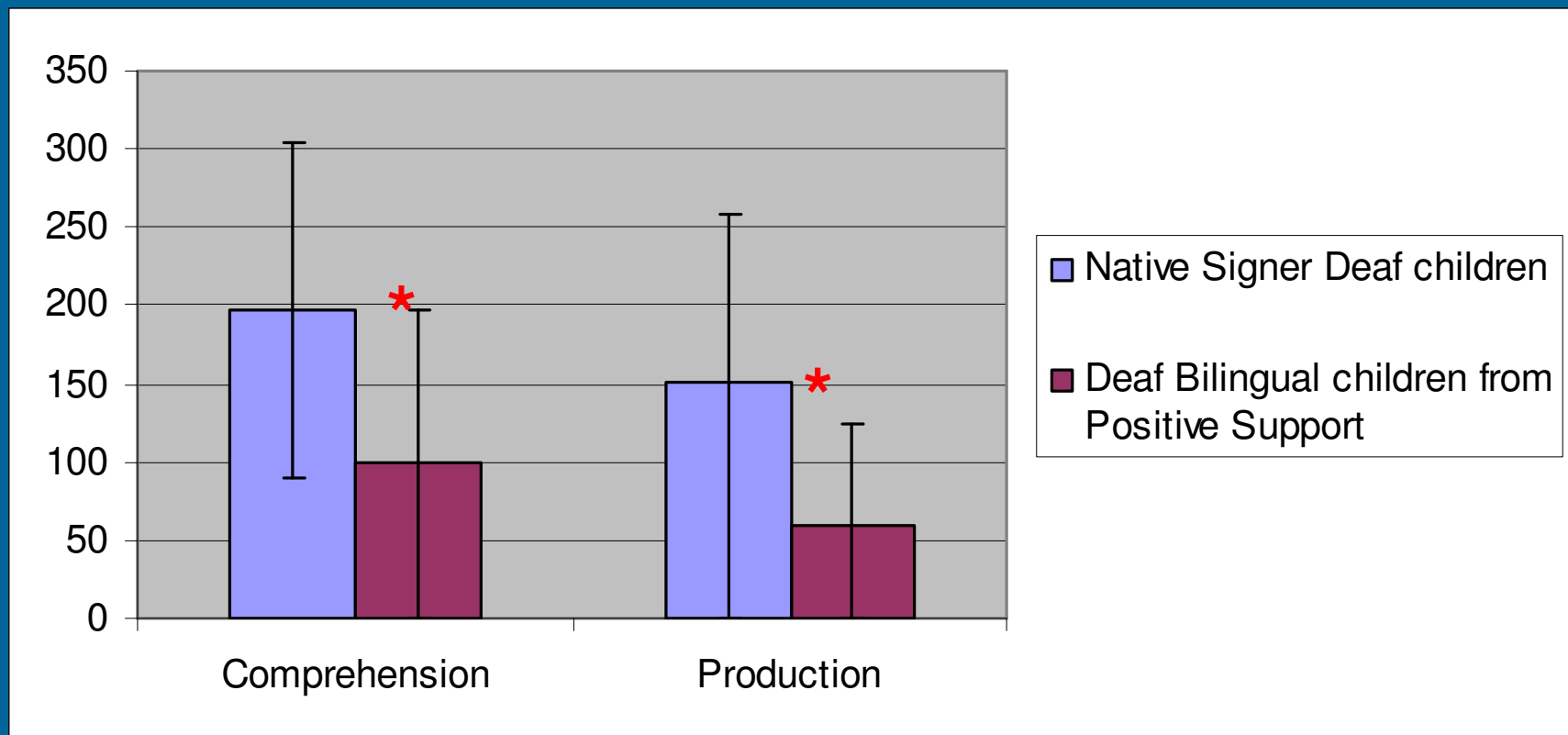
Age at diagnosis and English skills



Age at diagnosis is negatively correlated with English Comprehension ($r=-.38$; $p<.05$) and has a borderline correlation with English Production ($r=-.35$; $p=.06$).

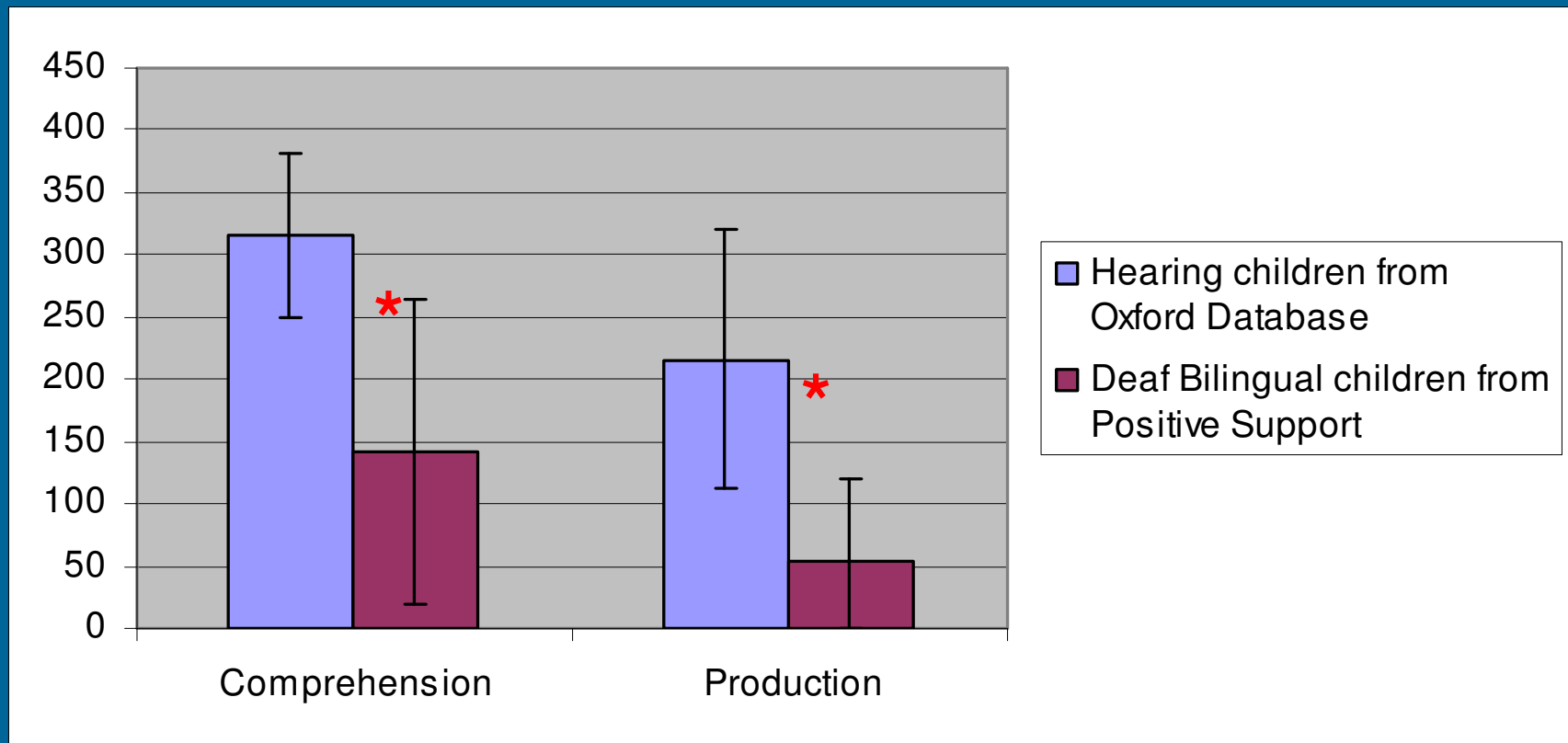
The earlier the diagnosis, the better the child's English skills. This is particularly striking since all these children were diagnosed earlier than 6m.

BSL scores for bilingual children from the Positive Support Project compared to native signing deaf children at 24m



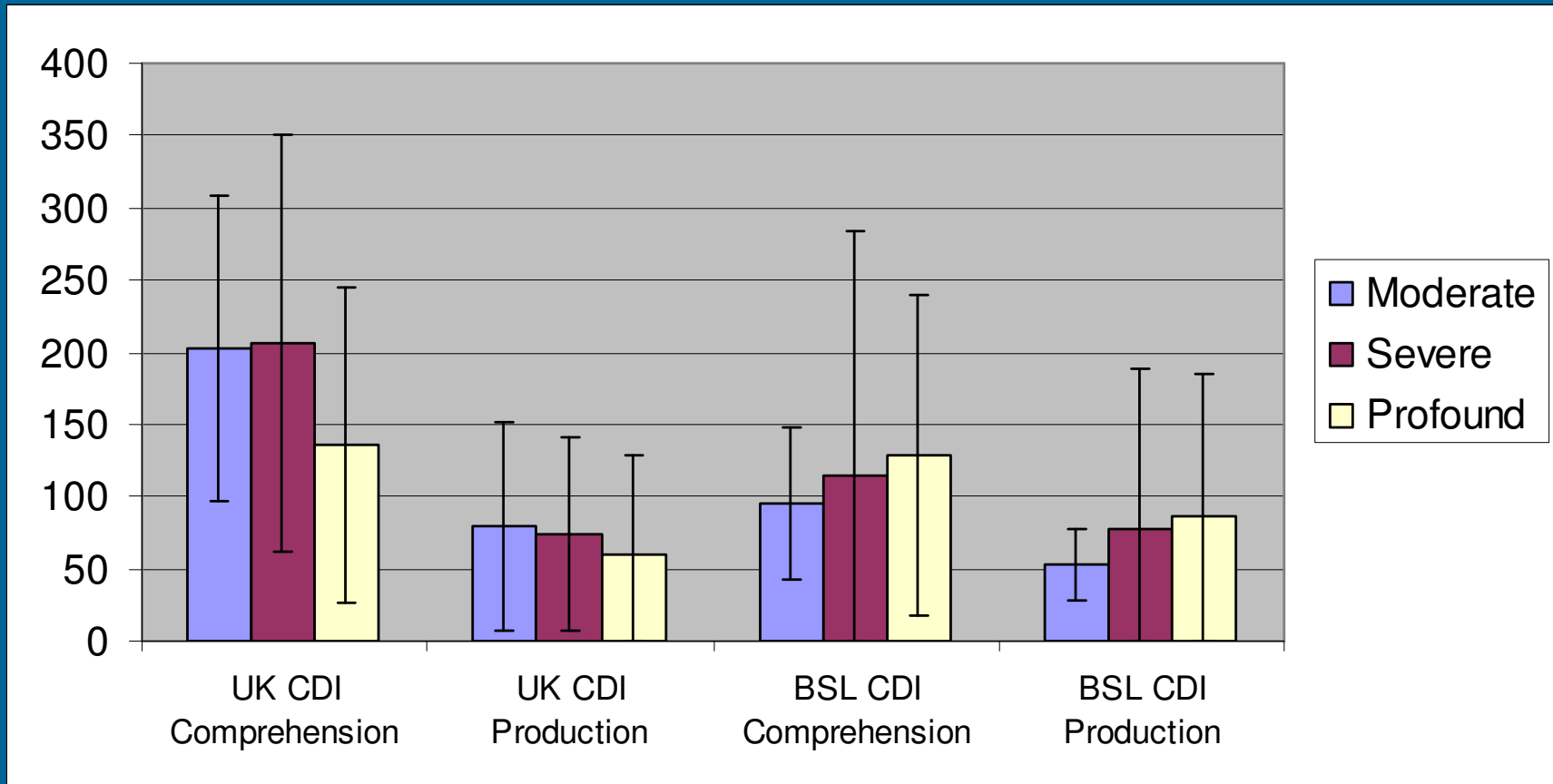
* Differences are significant in both Comprehension and Production as assessed through the BSL CDI ($p < .01$)

English scores for bilingual (BSL/English) children from the Positive Support Project and monolingual English speaking hearing children at 24m



* Differences significant in both Comprehension and Production ($p < .01$)

English and BSL-CDI scores x Hearing Loss



No significant differences, but a non-significant tendency for profoundly deaf children to be weakest in English skills and strongest in BSL skills

	ONLY English- CDI	CATEGORY		BOTH FORMS	CATEGORY		ONLY BSL-CDI	CATEGORY
1	again	QUANTIFIERS	1	aeroplane	VEHICLES	1	butterfly	ANIMALS
2	all gone	DESCRIPTIVE WORDS	2	baby	PEOPLE	2	clap	ACTION WORDS
3	apple	FOOD AND DRINK	3	ball	TOYS	3	cow	ANIMALS
4	bath/bathtub	FURNITURE AND ROOMS	4	banana	FOOD AND DRINK	4	crocodile	ANIMALS
5	bicycle/bike	VEHICLES	5	bath	GAMES AND ROUTINES	5	drink	ACTION WORDS
6	clock	HOUSEHOLD ITEMS	6	bear	ANIMALS	6	eat	ACTION WORDS
7	coat	CLOTHES	7	bird/chicken	ANIMALS	7	elephant	ANIMALS
8	down	PREPOSITIONS	8	biscuit	FOOD AND DRINK	8	food	FOOD AND DRINK
9	grandma	PEOPLE	9	book	TOYS	9	giraffe	ANIMALS
10	grandpa	PEOPLE	10	bunny/rabbit	ANIMALS	10	gone/all gone	QUANTIFIERS
11	hair	BODY PARTS	11	bye bye	GAMES AND ROUTINES	11	horse	ANIMALS
12	mouth	BODY PARTS	12	car	VEHICLES	12	lion	ANIMALS
13	mummy	PEOPLE	13	cat	ANIMALS	13	monkey	ANIMALS
14	nanny	PEOPLE	14	daddy	PEOPLE	14	mouse	ANIMALS
15	no	GAMES AND ROUTINES	15	dog	ANIMALS	15	pig	ANIMALS
16	nose	BODY PARTS	16	drink	FOOD AND DRINK	16	please	GAMES AND ROUTINES
17	shoe	CLOTHES	17	duck	ANIMALS	17	sheep	ANIMALS
18	sock	CLOTHES	18	eye	BODY PARTS	18	sleep	ACTION WORDS
19	teddy bear	TOYS	19	fish	ANIMALS	19	telephone	SMALL HOUSEHOLD ITEMS
20	up	PREPOSITIONS	20	hat	CLOTHING	20	toothbrush	SMALL HOUSEHOLD ITEMS
21	yes	GAMES AND ROUTINES	21	hello	GAMES AND ROUTINES	21	train	VEHICLES

Based on data from the
23 children with English &
BSL CDIs

Words in alphabetic order

22	hot	DESCRIPTIVE WORDS
23	milk	FOOD AND DRINK
24	more	QUANTIFIERS
25	nappy	CLOTHES
26	rain	OUTSIDE
27	shh/shush	GAMES AND ROUTINES
28	thank you	GAMES AND ROUTINES
29	where	QUESTION WORDS

	ONLY English-CDI	CATEGORY
1	again	QUANTIFIERS
2	all gone	DESCRIPTIVE WORDS
3	apple	FOOD AND DRINK
4	bath/bathtub	FURNITURE AND ROOMS
5	bicycle/bike	VEHICLES
6	clock	HOUSEHOLD ITEMS
7	coat	CLOTHES
8	down	PREPOSITIONS
9	grandma	PEOPLE
10	grandpa	PEOPLE
11	hair	BODY PARTS
12	mouth	BODY PARTS
13	mummy	PEOPLE
14	nanny	PEOPLE
15	no	GAMES AND ROUTINES
16	nose	BODY PARTS
17	shoe	CLOTHES
18	sock	CLOTHES
19	teddy bear	TOYS
20	up	PREPOSITIONS
21	yes	GAMES AND ROUTINES

	BOTH	CATEGORY
1	aeroplane	VEHICLES
2	baby	PEOPLE
3	ball	TOYS
4	banana	FOOD AND DRINK
5	bath	GAMES AND ROUTINES
6	bear	ANIMALS
7	bird/chicken	ANIMALS
8	biscuit	FOOD AND DRINK
9	book	TOYS
10	bunny/rabbit	ANIMALS
11	bye bye	GAMES AND ROUTINES
12	car	VEHICLES
13	cat	ANIMALS
14	daddy	PEOPLE
15	dog	ANIMALS

16	drink	FOOD AND DRINK
17	duck	ANIMALS
18	eye	BODY PARTS
19	fish	ANIMALS
20	hat	CLOTHING
21	hello	GAMES AND ROUTINES
22	hot	DESCRIPTIVE WORDS
23	milk	FOOD AND DRINK
24	more	QUANTIFIERS
25	nappy	CLOTHES
26	rain	OUTSIDE
27	shh/shush	GAMES AND ROUTINES
28	thank you	GAMES AND ROUTINES
29	where	QUESTION WORDS

	ONLY BSL-CDI	CATEGORY
1	butterfly	ANIMALS
2	clap	ACTION WORDS
3	cow	ANIMALS
4	crocodile	ANIMALS
5	drink	ACTION WORDS
6	eat	ACTION WORDS
7	elephant	ANIMALS
8	food	FOOD AND DRINK
9	giraffe	ANIMALS
10	gone/all gone	QUANTIFIERS
11	horse	ANIMALS
12	lion	ANIMALS
13	monkey	ANIMALS
14	mouse	ANIMALS
15	pig	ANIMALS
16	please	GAMES AND ROUTINES
17	sheep	ANIMALS
18	sleep	ACTION WORDS
19	telephone	SMALL HOUSEHOLD ITEMS
20	toothbrush	SMALL HOUSEHOLD ITEMS
21	train	VEHICLES

First Remarks

- In the first 50 signs + 50 words (100 words in total), 71 different words occur. The words/signs expressed in one language are not identical to those expressed in the other language.
- The bilingual children produce 29 out of these 71 items (41%) in both languages. The remaining 42 (59%) are produced only in one of the two languages.
- The bilingual children, like spoken language bilingual children in early stages of bilingual development prefer to learn new words/signs (this enlarges their total vocabulary) instead of learning a translation into a second language of the words/signs that they already know.
- There are language-specific features of early words: No **ACTION WORDS** were among the first 50 spoken words. These meanings were expressed through BSL

Conclusions

- The BSL CDI enables parents to take an active part in assessing their deaf child's communicative skills, alongside other instruments administered by appropriately trained professionals, to provide an accurate description of a deaf child's developmental profile
- An important contribution to the development and evaluation of intervention strategies designed to meet individual deaf children's needs, and to assessing deaf children's achievements in language rather than their deficiencies
- Has potential value for use in research as a means of matching subjects.

Acknowledgements

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