

Language Outcomes in Young Children with A Hearing Loss

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Faculty Disclosure **Information**

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We do not intend to discuss an unapproved/investigative use of a commercial product/device in our presentation.

A joint study by the Office of
Education Services of the NC
Dept. of Health and Human
Services

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BEGINNINGS For Parents of
Children Who Are Deaf or Hard
of Hearing, Inc.

Study Design Team

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BEGINNINGS for Parents of Children Who are Deaf or Hard of Hearing, Inc.

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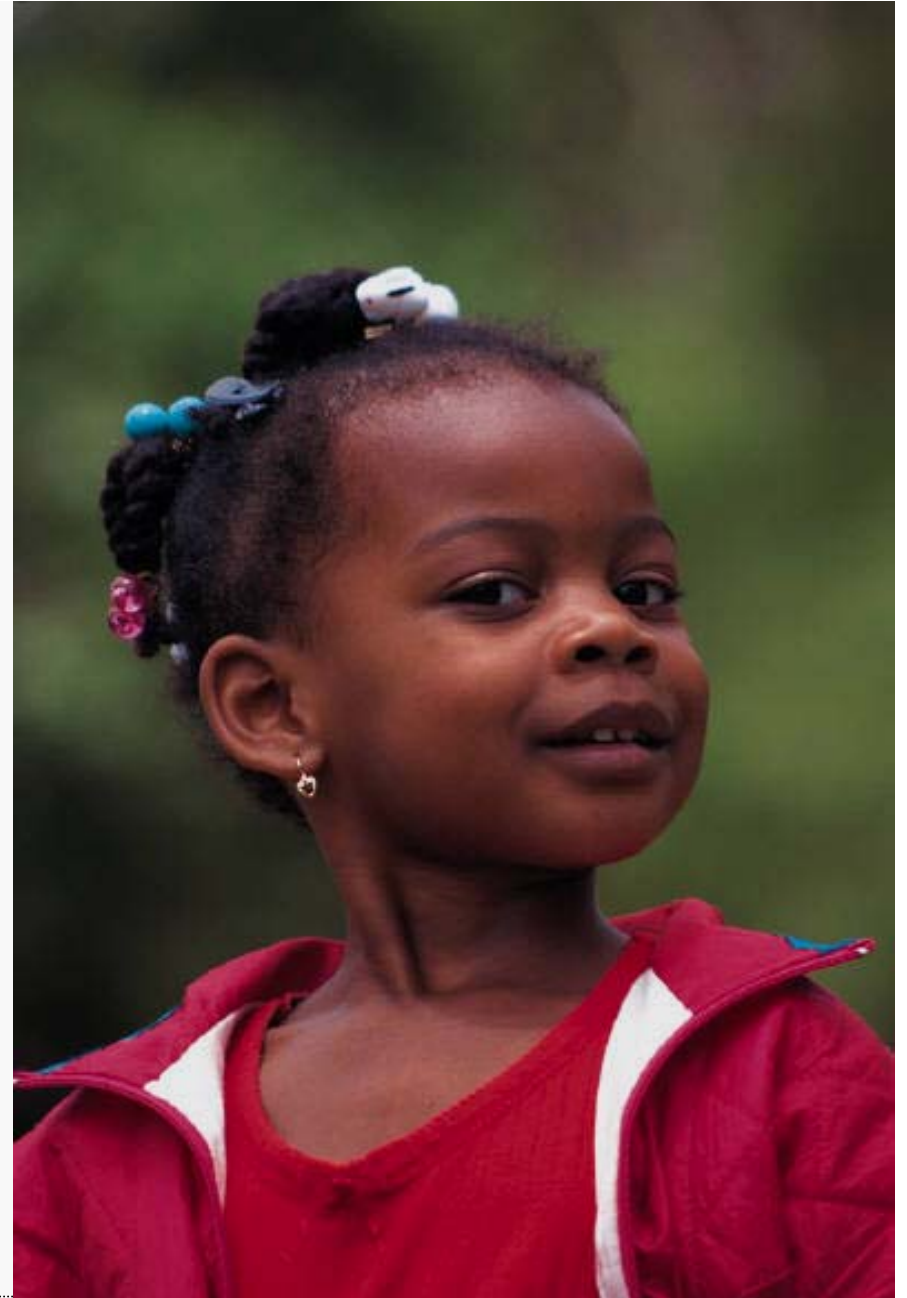


Study Purposes

1. Examine efforts to achieve 1-3-6 goals of NBHS
2. Examine language outcomes of children transitioning from EI to Preschool
3. Follow the language development progress of children after EI
4. Use the data for program evaluation & improvement

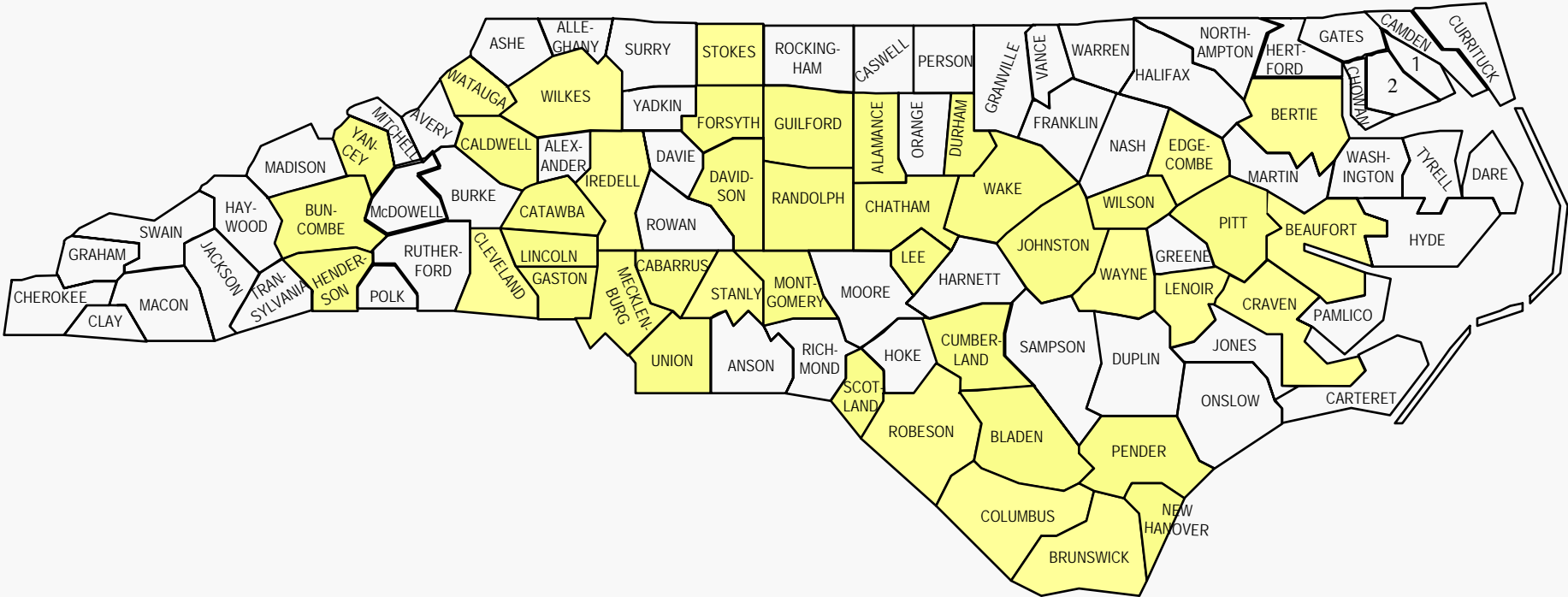
Study Subjects

- Received EI services
 - Born since newborn screening implemented
 - Three years old when enter study
 - Parents agree to participate
 - BEGINNINGS' database
-



Longitudinal Study Children Located in 43 of 100 Counties (n=114)

COUNTIES	
1	PASQUOTANK
2	PERQUIMANS



Reasons for Drop

46 of 114 families	Number	Percent
No response to BEGINNINGS calls	24	52
Mail undeliverable	6	13
Declined	4	9
Moved from NC	3	7
No response to SLP	3	7
Other	6	13

Methodology

- Design Team developed data collection forms
- BEGINNINGS created parent release forms, FAQs, abstract; translated into Spanish
- BEGINNINGS' staff, EI staff, CHAC were trained to use the forms
- PLS-4 examiners trained

Data Elements

Family/Child

Hearing status of parents & siblings

Primary language in home

Parent(s) job, highest education level

Other challenges – child

Avg. # hr/day child uses HI (or signs) at home

Communication choice(s)

Hearing

Newborn Hearing Screening results

Etiology of loss

Initial & transition hearing thresholds

Initial & transition hearing loss

Age at 1st Hearing Aid (HA) fitting

HA type/CI/FM

EI

Dates service began/ended

Location/frequency of serv.; length of session

Description of services

Level of parental participation in sessions

Other therapies child receives

Private speech therapy

32 Subjects

18/100 Counties

13 Boys

19 Girls

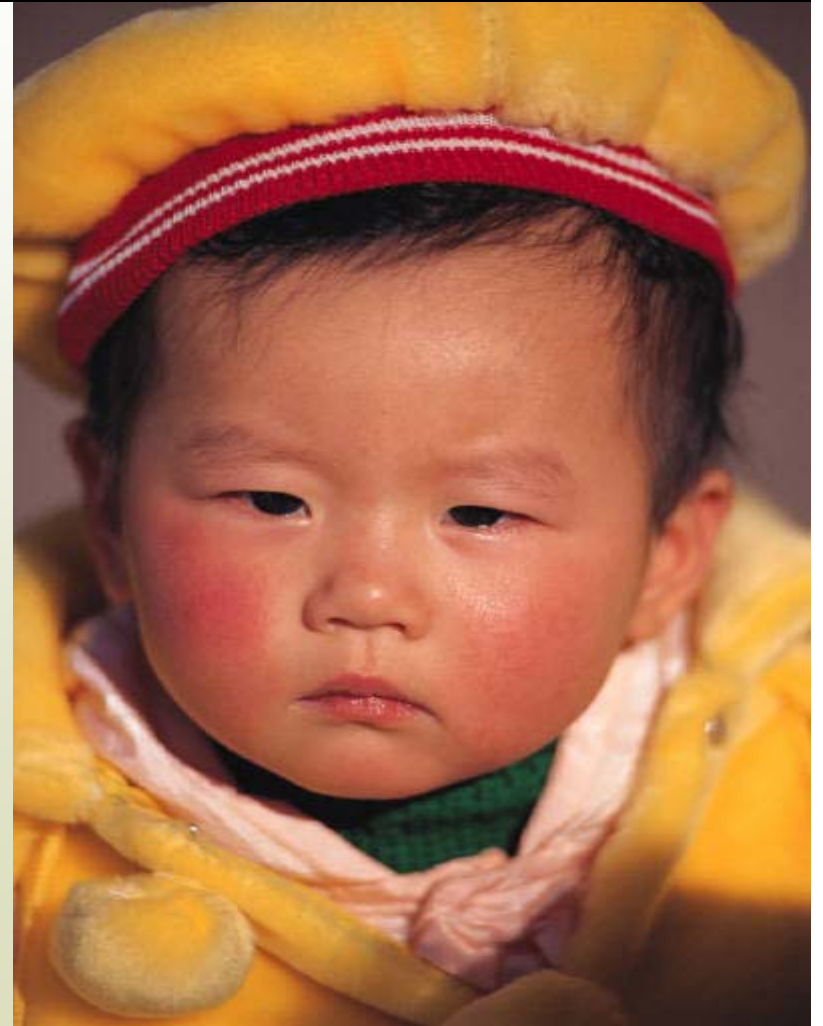
Ethnicity

White - 69% (22)

Black - 22% (7)

Latino - 9% (3)

Asian - 1% (1)





Type of Hearing Loss

at Transition from EI

Bilateral SNHL	26
Unilateral SNHL	2
Conductive	1
AN/AD	3

Mild - 4

Moderate - 11

Unknown - 1

Severe - 3

Profound – 13

A photograph of a family of four sitting on a couch. A woman on the left is smiling and holding a book. A young girl is sitting next to her, also smiling. A young boy is sitting in the middle, looking at the book. A man on the right is leaning in, looking at the book. The background is a simple living room with a window and some furniture.

Hearing Status of Parents

30 Hearing

2 Deaf or Hard of Hearing

Language in Home

29 English

3 Spanish

Parental Level of Education

	Mother	Father
< High Sch	6	4
High Sch	9	7
Associates	1	6
Undergrad	10	4
Masters	5	7
Ph.D/MD	1	2
TOTAL	32	30

Other Therapies



18 None

14 One or more (44%)

Private SLT – 9

Physical Therapy – 2

Play Therapy - 2

Occupational Therapy - 1

Private AV Therapy– 1

Private Preschool for HI - 1

Type of Hearing Instrument

Air conduction HA - 28

No amplification - 1

11 children have FM systems

12 children have CIs

3 of these have bilateral CI's

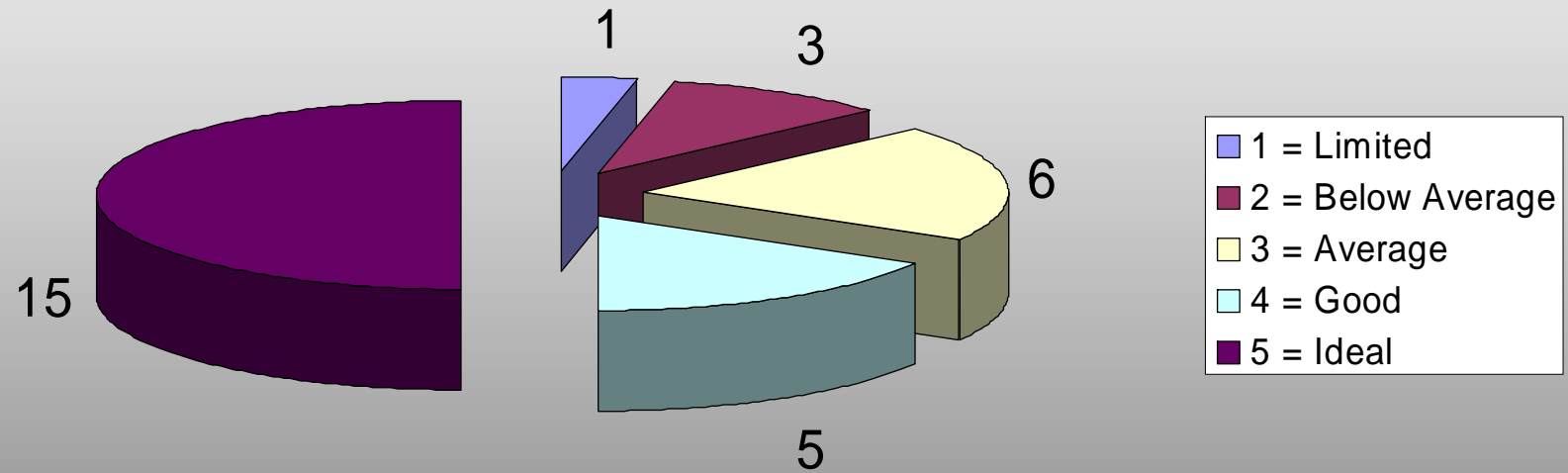
What We Have Learned

	<u>Percent</u>	<u>Number</u> <u>(N=30)</u>
<i>Screened by 1 month of age</i>	97%	28
<i>Re-screen in 1 mo. of screen</i>	53%	16
<i>Diagnosed by 3 mo.</i>	70%	21
<i>Amplified by 6 mo.</i>	50%	16
<i>EI services by 6 mo.</i>	60%	18

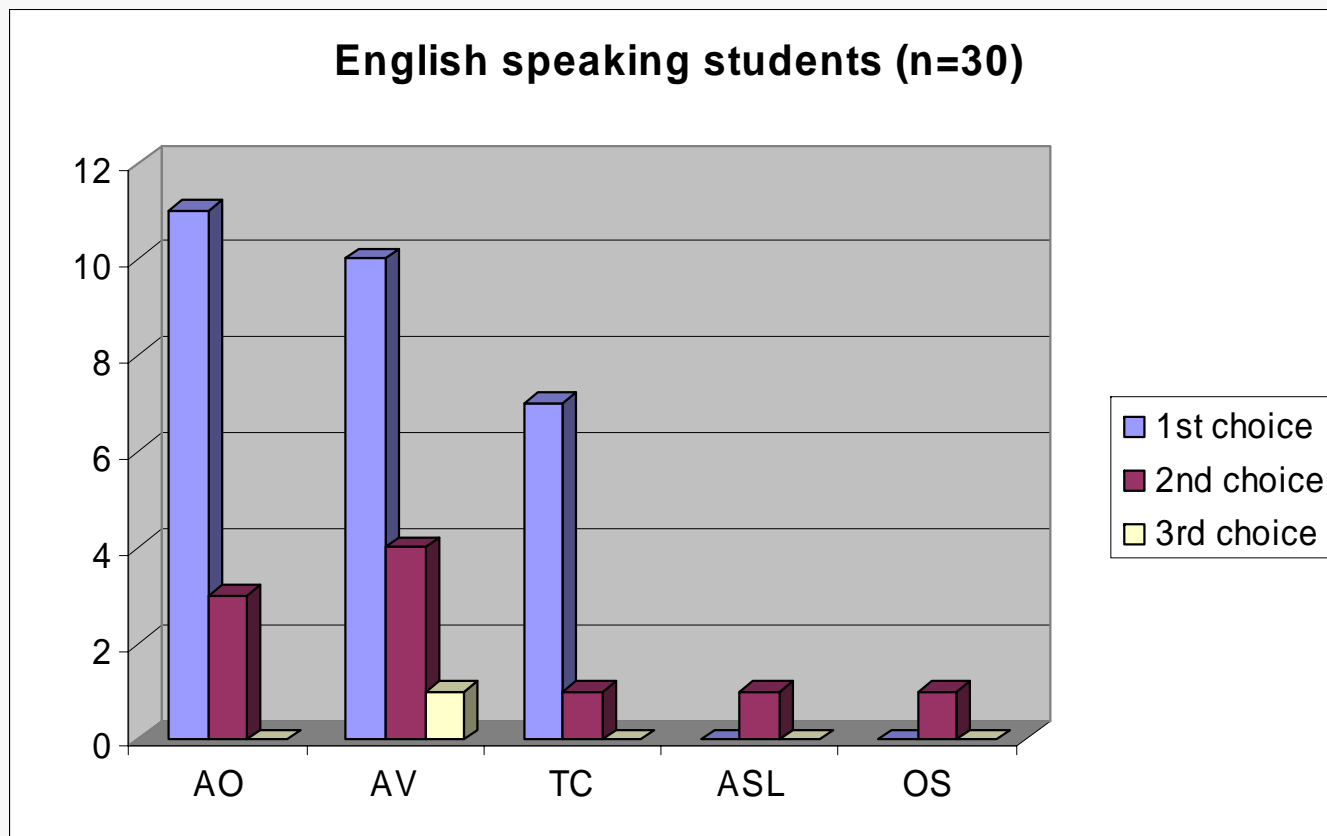
EI Family Involvement

Location	Almost Always	Some times	Rarely	None
Home (n=27)	23	3	1	0
Daycare (n=4)	2	0	0	2
Other (n=3)	1	0	0	2

Family Participation Rating



Communication Choices



Preschool Language Scale-4

- Administered to all subjects at ages 3, 4, 5, and 6
- Results compared with previous year(s)
- Results shared with parents and preschool



Preschool Language Scale -4



- Ages 0 to 6:11
- Two subscales
- Norm -referenced
- Administration time
- English/Spanish
- Routinely used in EI settings & kids with developmental delays

Language Assessments at Transition

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	24	24	24
Range =	51 – 125	50 – 123	50 - 127
Mean =	87	89	86
Median =	85	87	83

Language Assessments at Age 4

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	29	29	29
Range =	50 – 136	59 – 140	50 - 140
Mean =	95	96	94
Median =	93	93	92

Language Assessments at Age 5

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	13	13	13
Range =	50 – 114	50 – 111	50 - 114
Mean =	92	95	93
Median =	99	99	101

Language Assessments at Age 3

ALL CI's

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	12	12	12
Range =	51 – 99	54 – 102	50 - 98
Mean =	80	82	79
Median =	84	87	85.5

Language Assessments at Age 4

ALL CI's

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	12	12	12
Range =	50 – 135	59 – 139	50 - 140
Mean =	86	87	86
Median =	89	81	84.5

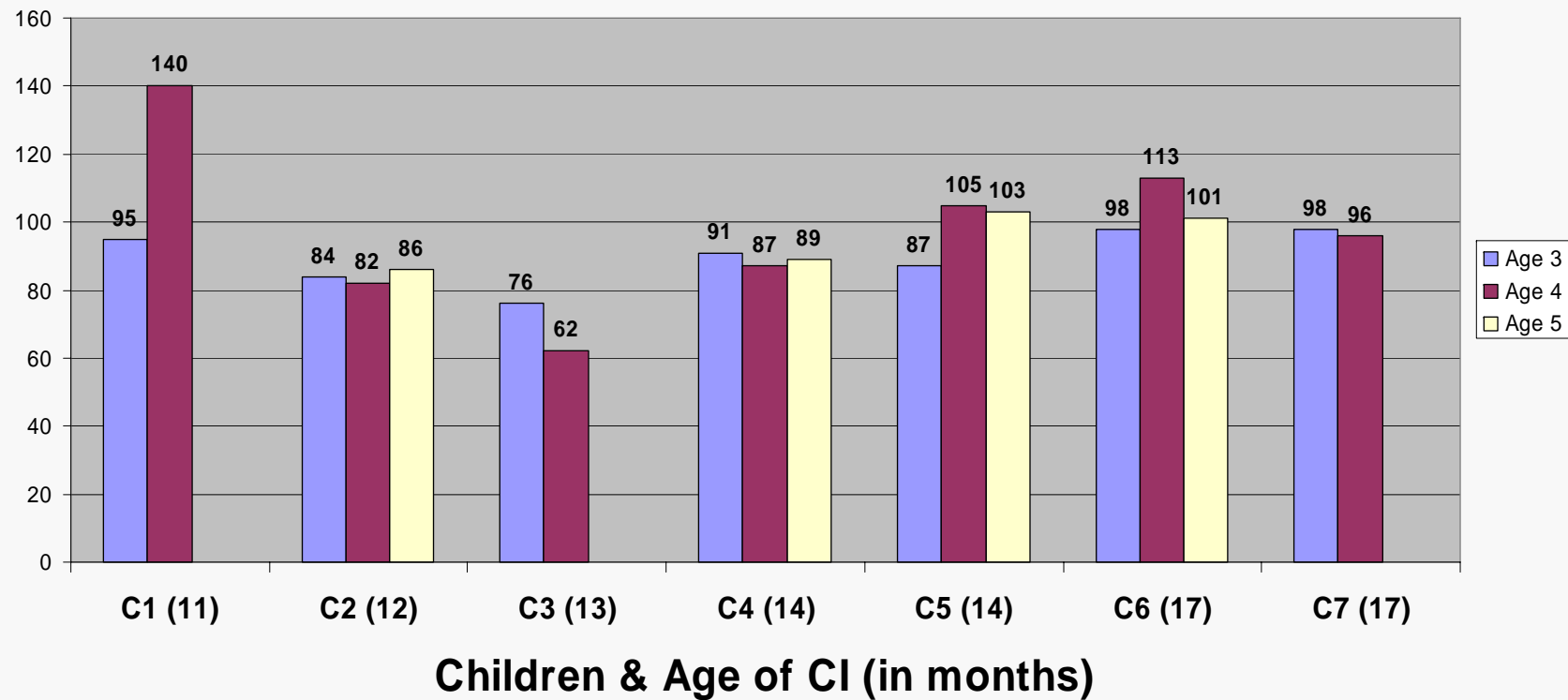
Language Assessments at Age 5

ALL CI's

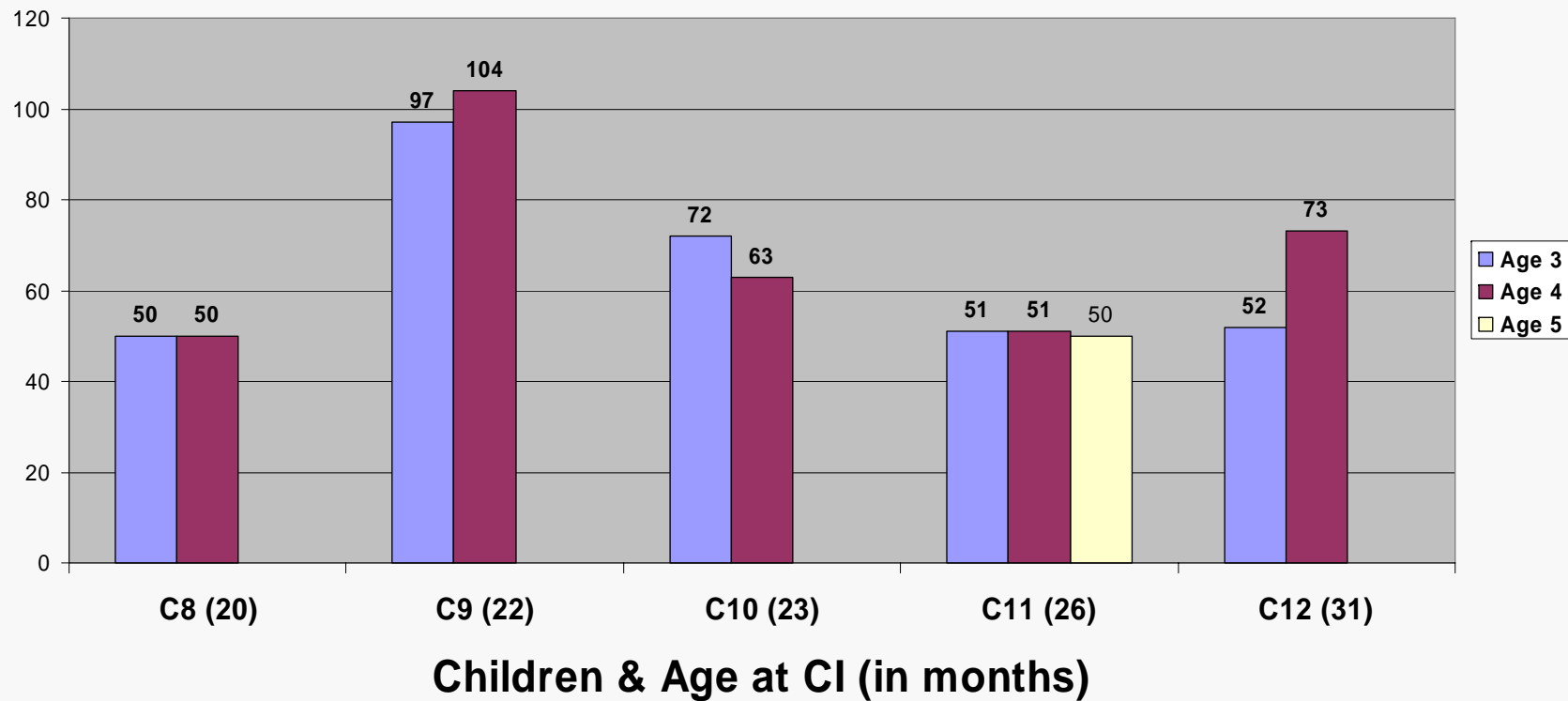
Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	5	5	5
Range =	50 – 104	50 – 106	50 - 103
Mean =	86	87	86
Median =	88	91	89

PLS-4 TL Score CI's < 18 months



PLS-4 TL Score CI's >18 Months



Language Assessments at Age 3

CI by 18 months

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	7	7	7
Range =	78 – 99	78 – 102	76 - 98
Mean =	90	91	90
Median =	94	92	91

Language Assessments at Age 4 CI by 18 months

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	7	7	7
Range =	59 – 135	72 – 139	62 - 140
Mean =	98	98	98
Median =	96	100	96

Language Assessments at Age 5

CI by 18 months

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	4	4	4
Range =	88 – 140	87 – 106	86 - 103
Mean =	95	96	95
Median =	93.5	95	95

Language Assessments at Age 3 CI After 18 Months

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	5	5	5
Range =	51 – 98	54 – 97	50 - 97
Mean =	65	68	64
Median =	55	61	52

Language Assessments at Age 4 CI After 18 Months

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	5	5	5
Range =	50 – 110	59 - 96	50 - 104
Mean =	70	72	68
Median =	61	72	63

Language Assessment at Age 3 Those Who Met 1-3-6

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	14	14	14
Range =	51 – 99	71 – 99	66 - 99
Mean =	86	88	86
Median =	87	90.5	89

Language Assessment at 4 Those Who Met 1-3-6

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	14	14	14
Range =	50 – 135	71 – 139	56 - 140
Mean =	95	95	94
Median =	102.5	96	99.5

Language Assessment at 5

Those Who Met 1-3-6

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	6	6	6
Range =	84 – 109	87 – 111	86 - 111
Mean =	95	98	95
Median =	93.5	96	95

Language Assessment at Age 3 By 1st Comm. Choice - AO

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	10	10	10
Range =	55 - 104	67– 97	57 - 96
Mean =	79	82	79
Median =	81.5	78	80

Language Assessment at Age 4 By 1st Comm. Choice - AO

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	13	13	13
Range =	50 - 123	61– 119	51 - 124
Mean =	81	86	82
Median =	84	89	87

Language Assessment at Age 5 By 1st Comm. Choice - AO

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	6	6	6
Range =	73 - 109	67– 111	67 - 111
Mean =	92	96	93
Median =	91.5	95	94.5

Language Assessment at Age 3 By 1st Comm. Choice - Av

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	9	9	9
Range =	61 - 125	77– 123	66 - 127
Mean =	91	95	93
Median =	98	94	95

Language Assessment at Age 4 By 1st Comm. Choice - AV

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	10	10	10
Range =	87 - 129	80 - 122	82 - 113
Mean =	108	104	107
Median =	108.5	103	105

Language Assessment at Age 5 By 1st Comm. Choice - AV

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	4	4	4
Range =	88 - 104	91 - 111	89 - 106
Mean =	98	102	100
Median =	99	102.5	102

Language Assessment at Age 3 By 1st Comm. Choice - TC

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	6	6	6
Range =	51 - 117	54 - 114	50 - 117
Mean =	76	79	75
Median =	65.5	73.5	68.5

Language Assessment at Age 4 By 1st Comm. Choice - TC

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	7	7	7
Range =	50 - 136	59– 140	50 - 140
Mean =	87	88	86
Median =	86	81	82

Language Assessment at Age 5 By 1st Comm. Choice - TC

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	3	3	3
Range =	50 - 114	50 - 111	50 - 114
Mean =	84	83	83
Median =	88	87	86

Language Assessment at Age 3 by FPRS 1/2

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	3	3	3
Range =	51 – 178	61 – 89	51 - 82
Mean =	61	74	64
Median =	55	72	60

Language Assessment at Age 4 by FPRS 1/2

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	4	4	4
Range =	51 – 87	61 – 89	51 - 87
Mean =	66	72	65
Median =	63	68	61

Language Assessment at Age 5 by FPRS 1/2

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	2	2	2
Range =	50 – 73	50 – 67	50 - 67
Mean =	62	59	59
Median =	62	56	59

Language Assessment at Age 3 by FPRS 3

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	6	6	6
Range =	55 – 87	67 – 94	57 - 87
Mean =	76	80	76
Median =	80	78	77.5

Language Assessment at Age 4 by FPRS 3

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	6	6	6
Range =	50 – 107	61 – 102	51 - 105
Mean =	73	83	76
Median =	72	83	72

Language Assessment at Age 5 by FPRS 3

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	2	2	2
Range =	50 – 73	50 – 67	50 - 67
Mean =	62	59	59
Median =	62	59	59

Language Assessment at Age 3 by FPRS 4/5

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	16	16	16
Range =	51 – 125	54 – 123	50 - 127
Mean =	89	90	89
Median =	94	94.5	95

Language Assessment at Age 4

By FPRS 4/5

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	20	20	20
Range =	50 – 136	59 – 140	50 - 140
Mean =	102	100	101
Median =	105	102	104

Language Assessment at Age 5 by FPRS 4/5

Preschool Language Scale – Fourth Edition (PLS-4)

	<u>Auditory Comp.</u>	<u>Expressive Lang.</u>	<u>Total Lang.</u>
N =	9	9	9
Range =	84 - 114	87 - 111	86 - 114
Mean =	99	101	100
Median =	99	99	101

Limitations

- Conducting a study of this scope with no additional funding.
 - The number of people involved in data collection.
 - Management of large amounts of data.
 - Conducting research with “non-researchers.”
-



- Not all EI, screening and diagnostic data are in one place, requiring time-consuming follow-up.
 - “Scope Creep” – the scope of work keeps expanding.
 - Numerous sources from which data must be collected.
 - Access to hearing information.
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- No developmental assessments to match PLS-4.
 - Cadre of SLPs needed to test at ages 4-6.
 - Mobility of families (40% drop rate to date).
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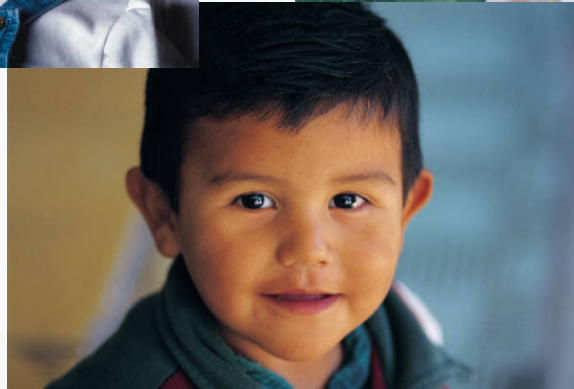
CONCLUSIONS

- C
 - B
 - B
 - D
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Next Steps...

- Complete testing of 5 year olds using the PLS-4, by end of 2008
 - Begin testing 6 year olds in April 2008
 - Begin analysis of data of children with other conditions
 - Design full study
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Thank you!!



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