

Early Intervention at the Foundation of Reading Comprehension: Response of children with SLI and the role of Non-Verbal IQ

Nuffield Language for Reading Project

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Nuffield Language for Reading

- Professor Margaret Snowling
- Professor Charles Hulme
- Dr Julia Carroll
- Dr Jeremy Miles
- Fiona Duff
- Elizabeth Fieldsend





Today's Remit

- Role of nonverbal IQ in response to intervention
- Nuffield Language 4 Reading project
- Secondary analysis looks at nonverbal IQ



Background

- Children with SLI respond to training in phonological awareness and early reading (Gillon 2000, 2002)
- Treatment resisters similar language profile to SLI (Al Otaiba & Fuchs, 2006; Vadasay, Sanders & Abbott, 2008; Whiteley, Smith, & Connors, 2007; Duff et al. 2008)
- Non-verbal IQ not predictive of response to reading intervention (Hatcher & Hulme, 1999; Stuebing, Barth, Molfese, Weisse & Fletcher, 2009).
- Fuchs & Young (2002) - prediction of non-verbal IQ varies with age.

Question: Differential response to L4R intervention for children with SLI vs General Delay?



Nuffield Language for Reading

- Evaluation of two intervention programmes; oral language and phonology with reading
- RCT
- 19 schools;
- n= 152 (mean age 4;8); 8 children in each school
- n= 4 in each arm
 - n=76 oral language
 - n= 76 phonology with reading
- Weak verbal skills (WPPSI)
- 20 weeks of daily intervention (group and individual)
- Teaching assistant delivered



Language for Reading Summary

- Both intervention programmes were effective in promoting basic skills that underlie reading comprehension
 - Oral Language programme facilitated vocabulary and grammatical skills
 - Phonology with Reading programme supported word-level reading skills and phoneme awareness



Selection Criteria

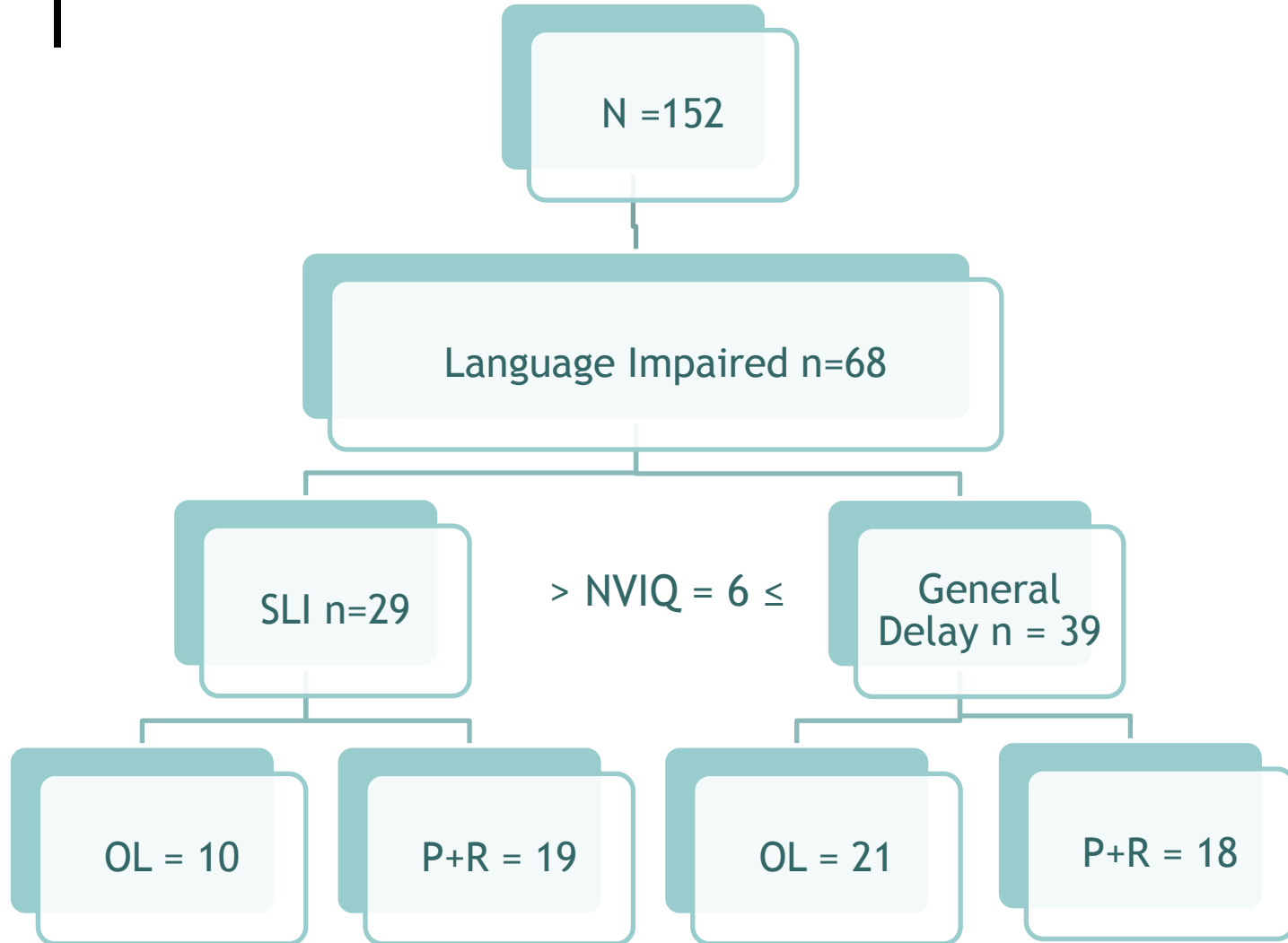
- Children selected with weak verbal skills
 - Picture Naming
 - Vocabulary/Word Reasoning Composite
- NWR/NVIQ measured but not selection criteria
- More fine-grained selection needed for SLI
- Bishop et al. (1999) - criteria for SLI
 - Score <80 2/5 language tests
 - At least one receptive language test
 - NVIQ > 80



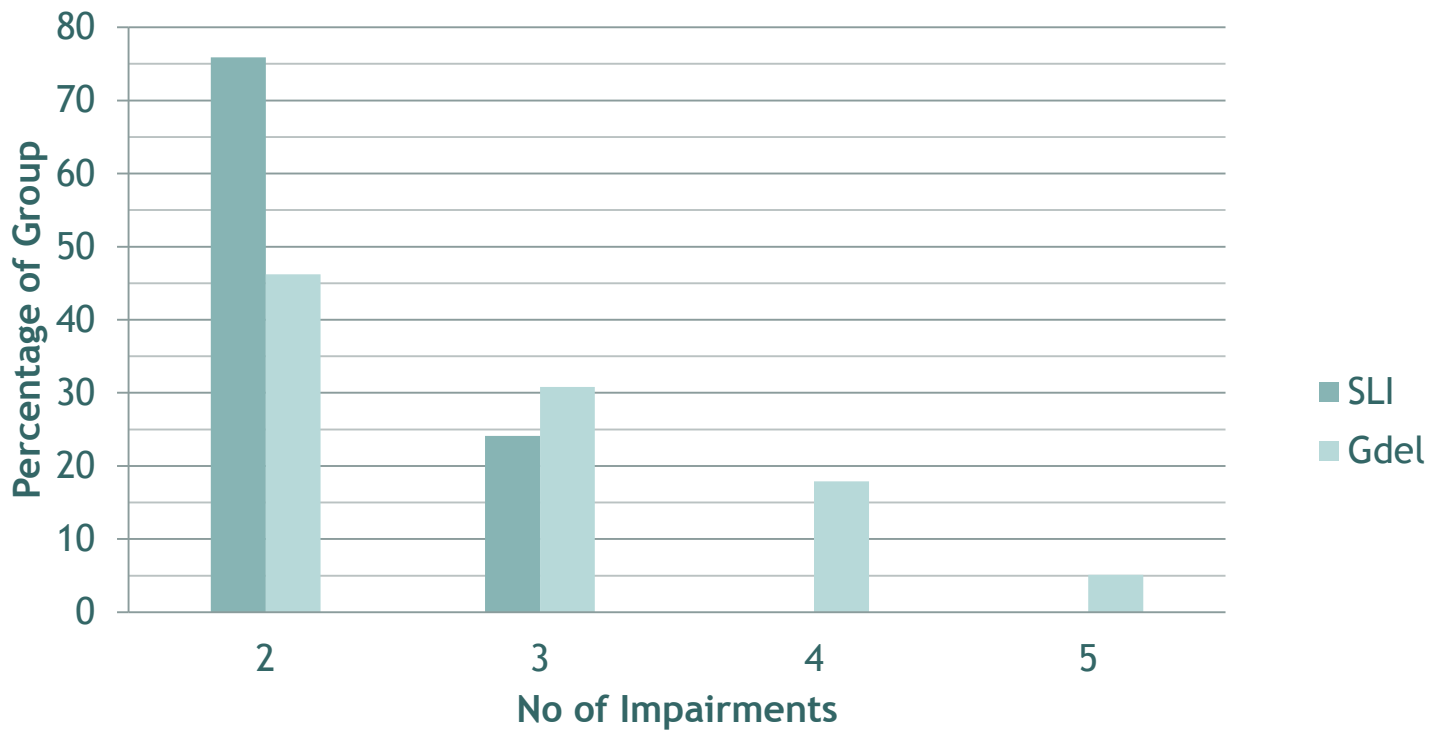
Specific Language Impairment?

- Language impaired defined as:
 - Impaired on 2/5 language measures at t0/t1:
 - NWRep < 80 (standardised on 961 children)
 - Bus Story Information < 10th percentile (≤ 5)
 - APT Grammar < 10th percentile (≤ 9)
 - Picture Naming Scaled score ≤ 6
 - Vocabulary Scaled Score ≤ 6

Language Impaired Groups



Frequency Data



Baseline Descriptives

	SLI (n = 29)	GenDelay (n=39)
Age(mths)	56.17 (3.16)	55.33 (3.25)
Block Design	8.55 (1.97)	3.97 (1.87)***
NWRStd	88.42 (17.17)	81.27 (14.91)
Vocab Scaled	5.83 (2.41)	5.13 (1.70)
PicNam Scaled	5.55 (1.27)	5.26 (1.43)
Bus Story Info	11.86 (6.97)	8.69 (5.67)*
APT Grammar	15.0 (5.69)	12.51 (5.85)
PhonAwareness	7.93 (7.53)	3.62 (6.11)**
Letter Knowledge	14.79 (6.34)	11.41 (7.05)*
Free School Meals	N=9 (31%)	N=10 (25.6%)

*p<.05, **p<.01, *** p<.001



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Outcome Measures

○ Literacy

- Letter Knowledge
- Early Word Reading
- Spell - Raw and PCC
- Read Comprehension and Accuracy (Neale)
- NonWord Reading (GNWRT)
- Phoneme Awareness (Sound Isolation)
- Segmenting, Blending and Deletion
- Phoneme Completion (PAT)

○ Language

- Specific Vocabulary
- Picture Naming
- Action Picture Test - Grammar and Information
- Sentence Length (Bus Story)
- Narrative (Bus Story)
- Listening Comprehension

Control for autoregressor, age, gender, Letter Knowledge and Phoneme Awareness



Outcome Measures

○ Literacy

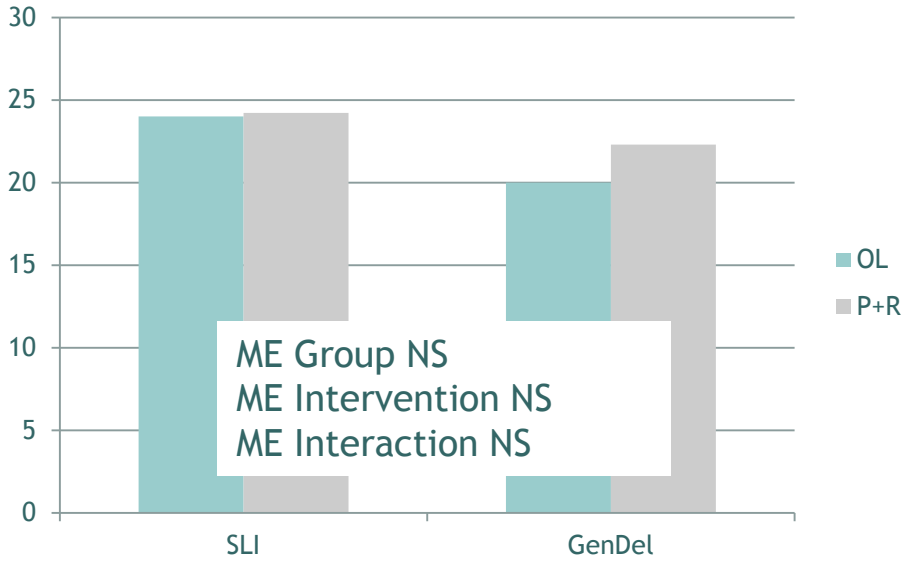
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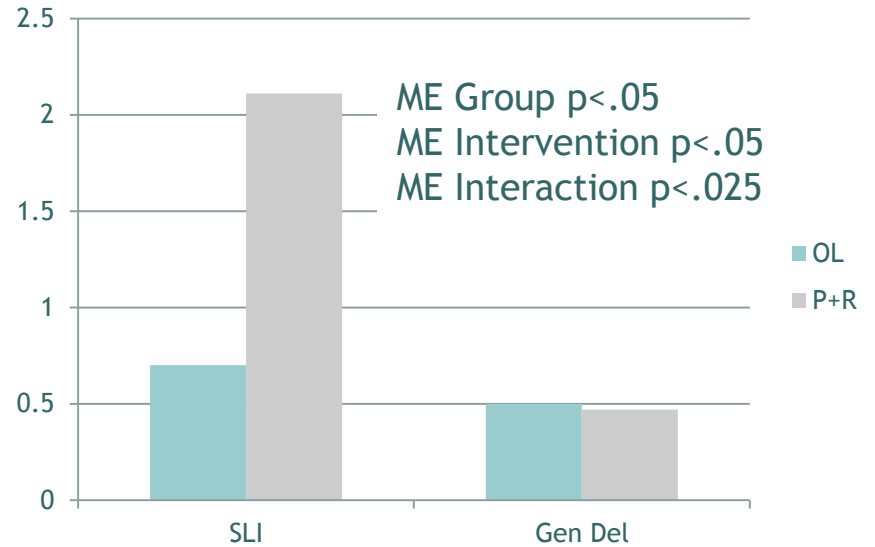
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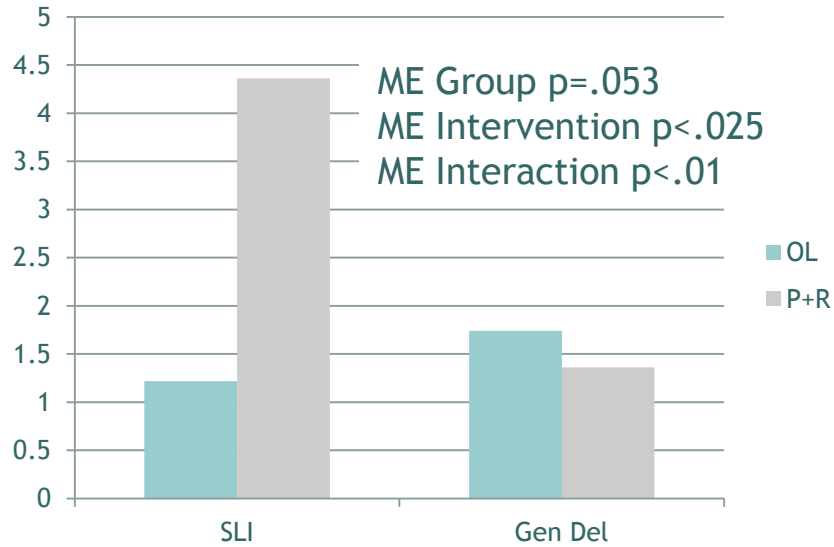
Letter Sound Knowledge t3



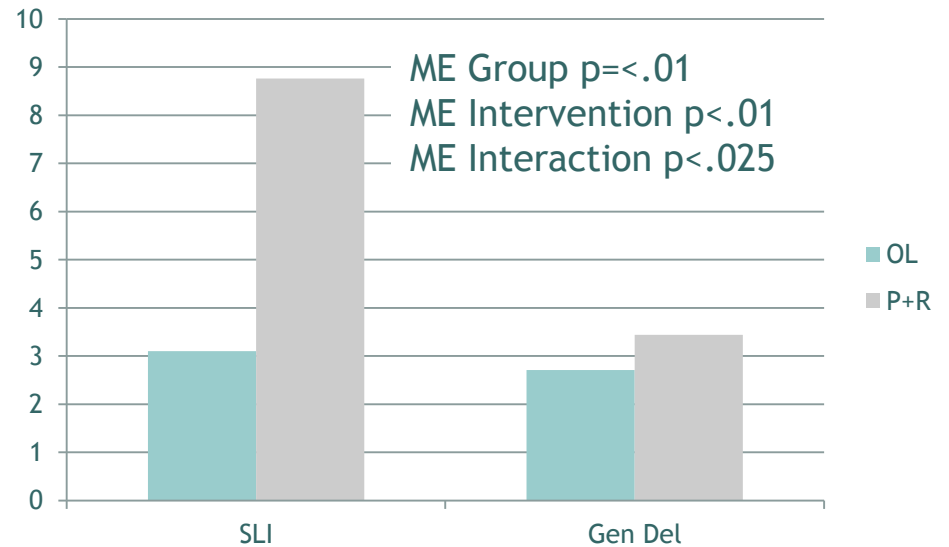
Spelling t3



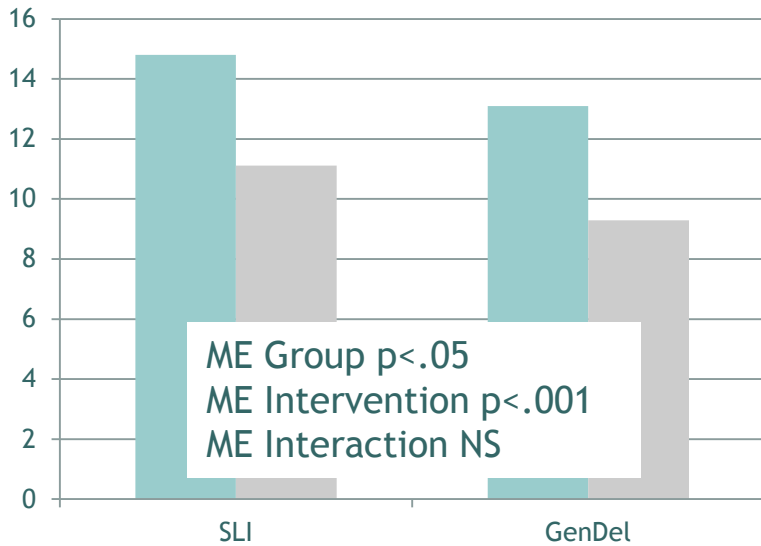
Spelling t4



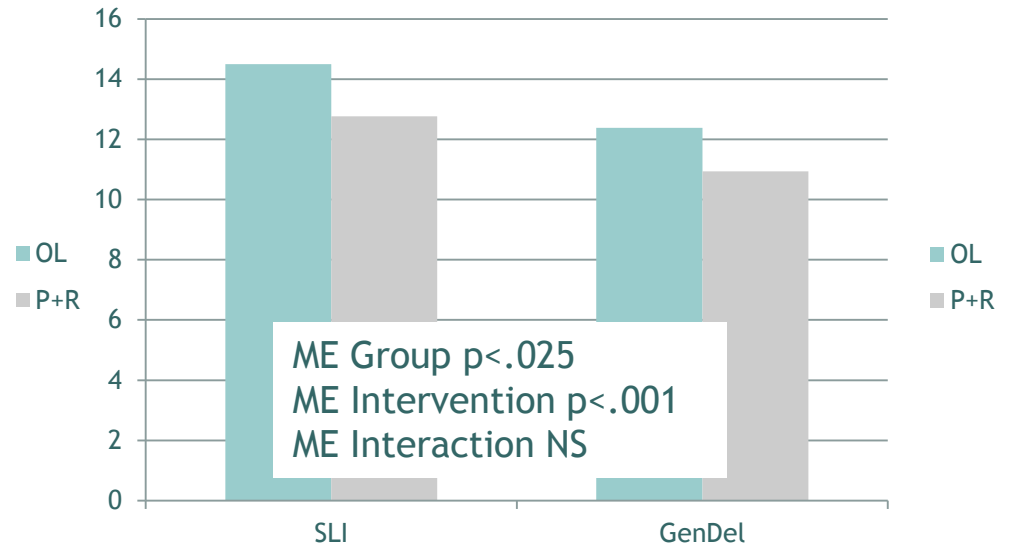
Phonological Awareness t3



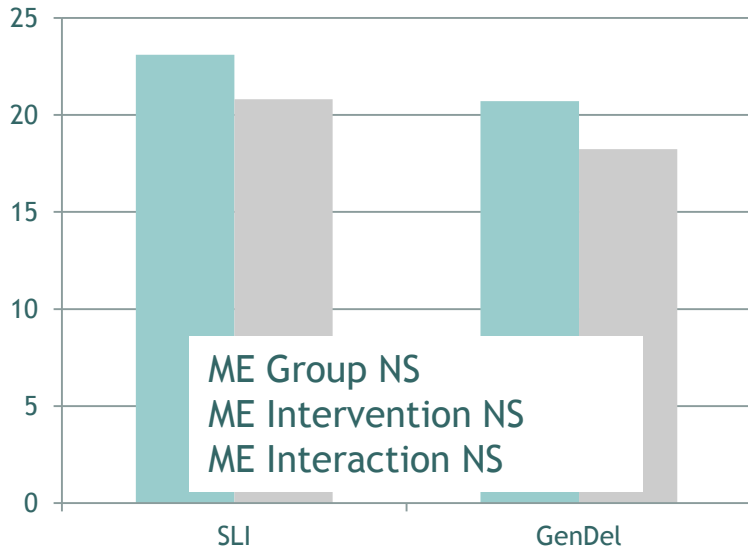
Specific Vocabulary t3



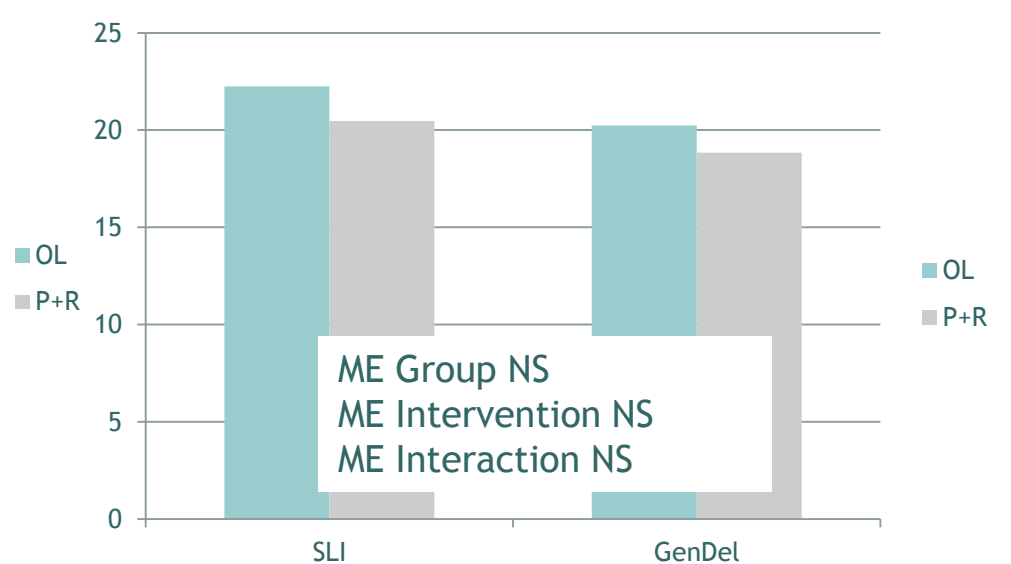
Specific Vocabulary t4



Expressive Vocabulary t3



Expressive Vocabulary t4





Educational Achievement: SAT Reading KS1

	SLI	Gen Del
SATs Level	n=17	n=24
2	15 (88)	9 (37)
1	2 (12)	10 (42)
Below level 1	0	5 (21)

Percentage in brackets



Conclusions

- Children with more pervasive language difficulties - less progress on literacy measures after P+R intervention
 - Weaker phonological skills - but treatment effect only seen in P+R group
 - Children with SLI use their general ability to bootstrap their initial response to literacy intervention
 - Children with general delay - limited resources to boost literacy skill
- Difference reflected in SAT Reading Scores (KS1)
- Both groups continue to have difficulty with Oral Language measures



Conclusions

- Response to intervention - moderated by general ability in addition to level of oral language and phonological awareness
- Further Question:
 - Changing profiles over time
 - Selection of children
 - Assessment of non-verbal IQ



Thank You

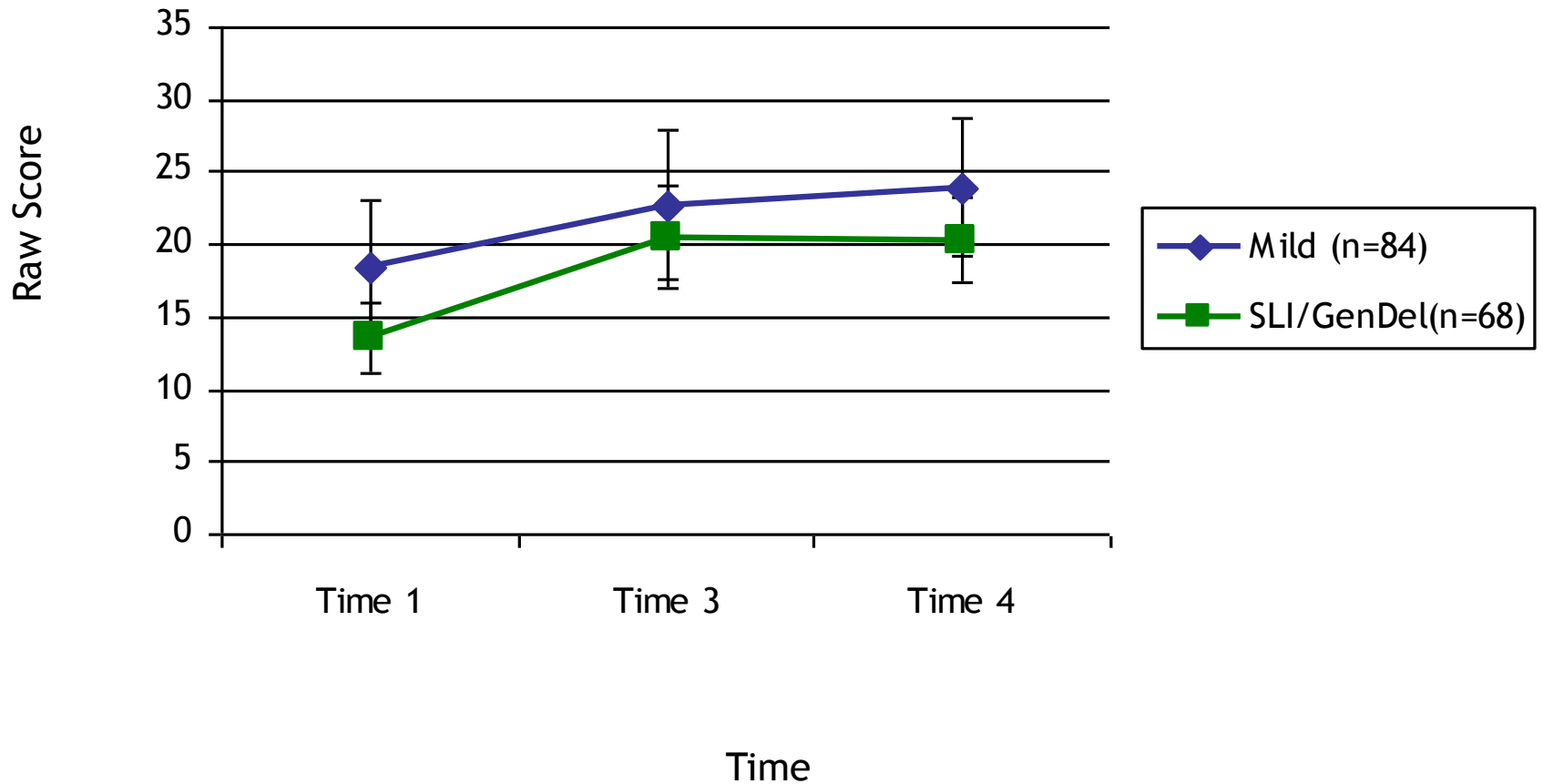
- *Funders:* Nuffield Foundation, North Yorks County Council
- *Sponsors:* Jolly Phonics; Black Sheep
- *Schools:* Pupils, TAs and teachers
- *Assistants:* Naomi Meredith, Nicky Vowles, Rachel Harlow, Debbie Gooch, Ros Francis, Dimitra Ionnau, Lisa Henderson, Lizzie Bowen, Natalie Falkinder, Sarah Edwards, Emma Truelove, Kim Manderson, Jodie Unau, Michelle Cargan, Pam Baylis, Rachael McCool, Elisa Romeo, Meesha Warmington, Poppy Nash



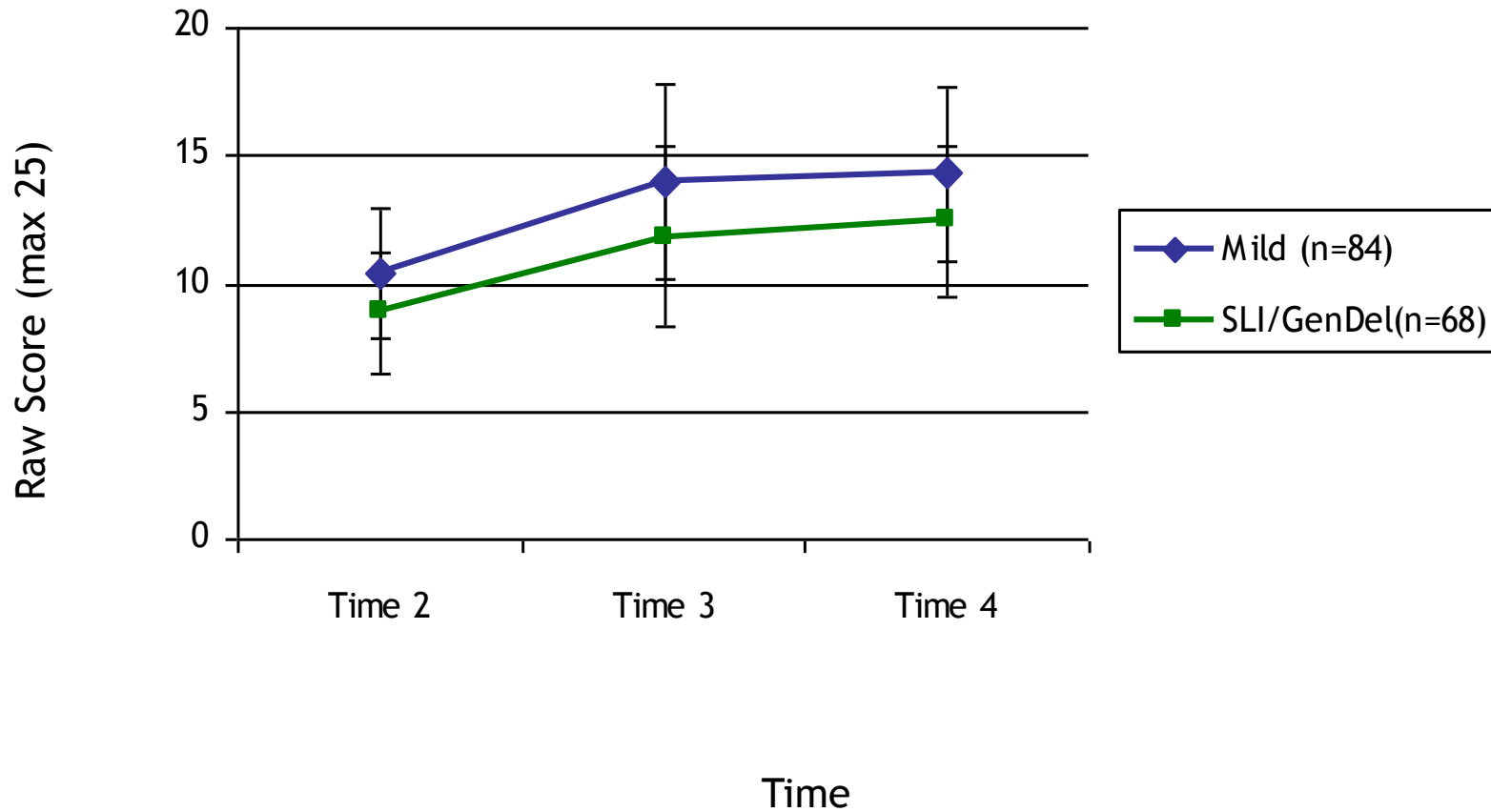
Summary

- At end of intervention period:
 - Children with SLI showed an advantage to general delay group on literacy measures
 - No difference between groups on oral language measures
- Implications for overall findings - driven by children with less severe language impairments?

Language Growth - Action Picture Test



Language Growth - Specific Vocabulary



Group Intervention	SLI		GD	
	OL (n=10)	P+R (n=19)	OL (n=21)	P+R (n=18)
Literacy				
Letter Sound Knowledge t3	24.00 (2.4)	24.21 (2.9)	20.00 (6.19)	22.29 (4.49)
Letter Sound Knowledge t4	24.40 (2.3)	25.18 (1.7)	22.76 (4.0)	23.56 (3.2)
Spelling raw t3	0.70 (1.1)	2.11 (1.4)	0.50 (0.8)	0.47 (0.6)
Spelling raw t4	1.22 (1.2)	4.36 (2.9)	1.74 (1.4)	1.36 (1.1)
Phonological Awareness t3 ^a	3.10 (3.8)	8.76 (5.3)	2.71 (2.2)	3.44 (3.2)
Language				
Specific Vocabulary t3	14.80 (2.3)	11.11 (2.9)	13.10 (3.5)	9.29 (3.1)
Specific Vocabulary t4	14.50 (2.9)	12.76 (2.7)	12.38 (2.5)	10.94 (3.3)
Expressive Grammar t3	23.10 (2.8)	20.81 (5.5)	20.71 (5.5)	18.24 (4.8)
Expressive Grammar t4	22.25 (4.01)	20.47 (3.45)	20.24 (4.37)	18.84 (5.83)