



The role of speech sound disorder in the etiology of dyslexia

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Categorising Speech and language difficulties

- Speech versus language
 - Several researchers find that only children with speech and language difficulties go on to have literacy difficulties
 - Bishop & Adams (1990); Catts (1991)
 - BUT there is a problem of independence and severity:
 - Children with speech and language difficulties have more severe speech problems
 - Speech perception plays an important role in acquiring vocabulary and syntax



Types of speech difficulty

- Delay versus disorder
 - **Dodd (1995)** argues that children who make errors that are delayed are unlikely to show literacy difficulties. Those with disordered speech show difficulties
 - **Leitao et al (1999, 2004)** confirmed this with a sample of children with and without language difficulties. Children with disordered speech had literacy difficulties.
 - **Holm et al (2008)** showed that children with disorder show unusual patterns of phonological awareness.



Questions

- How common is speech sound disorder in this sample?
- Is it associated with family risk?
- Is it associated with language difficulties?
- Do children with speech sound disorder have literacy difficulties?
 - Does this differ according to speech delay versus disorder?
 - If yes, is this explained by their language level?



Frequency of Speech Sound Disorder at 3 ½ years

	Number with SSD	Percentage
Typical	12/80	15.0%
FR only	16/86	18.6%
LI only	16/31	58.1%
FR & LI	15/35	45.7%

Speech sound disorder is associated with language impairment, regardless of FR status



Types of Speech Sound Disorder

	Speech Delay	Speech Disorder	Articulation
Typical	9 (75%)	3 (25%)	0
FR only	9 (56%)	6 (38%)	1 (6%)
LI only	5 (31%)	10 (63%)	1 (6%)
FR & LI	9 (60%)	6 (40%)	0

- No association between type of speech sound disorder and FR or LI



Changes in Speech Sound Disorder Classification

	Time 3 Outcome			
Time 1	Resolved	Delayed	Disordered	Articulation
Delayed	15	10	2	4
Disordered	12	4	4	2
Articulation	1	0	0	0

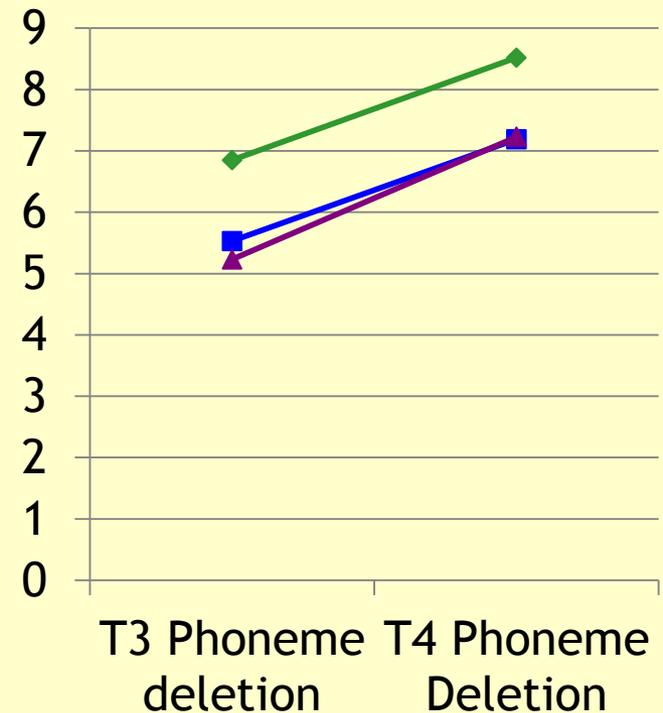
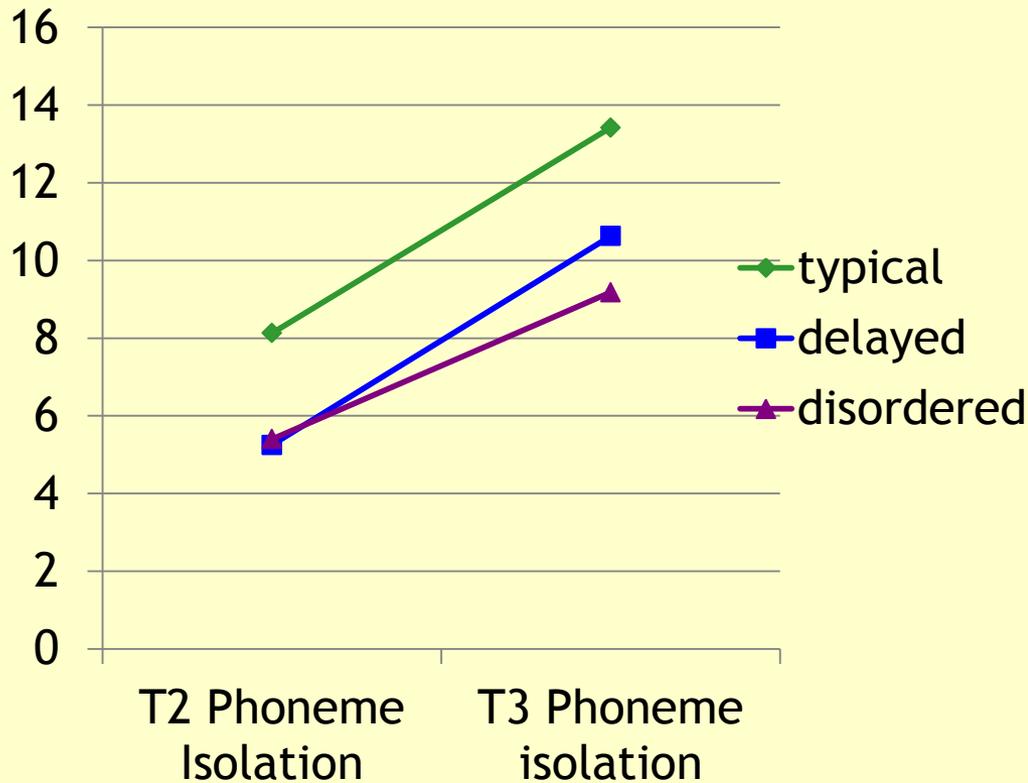
163 had no impairment at T1 - none developed an impairment by T3

Around half of the delayed and the disordered group had resolved by T3

No particular pattern with type of speech error



Phonological Awareness

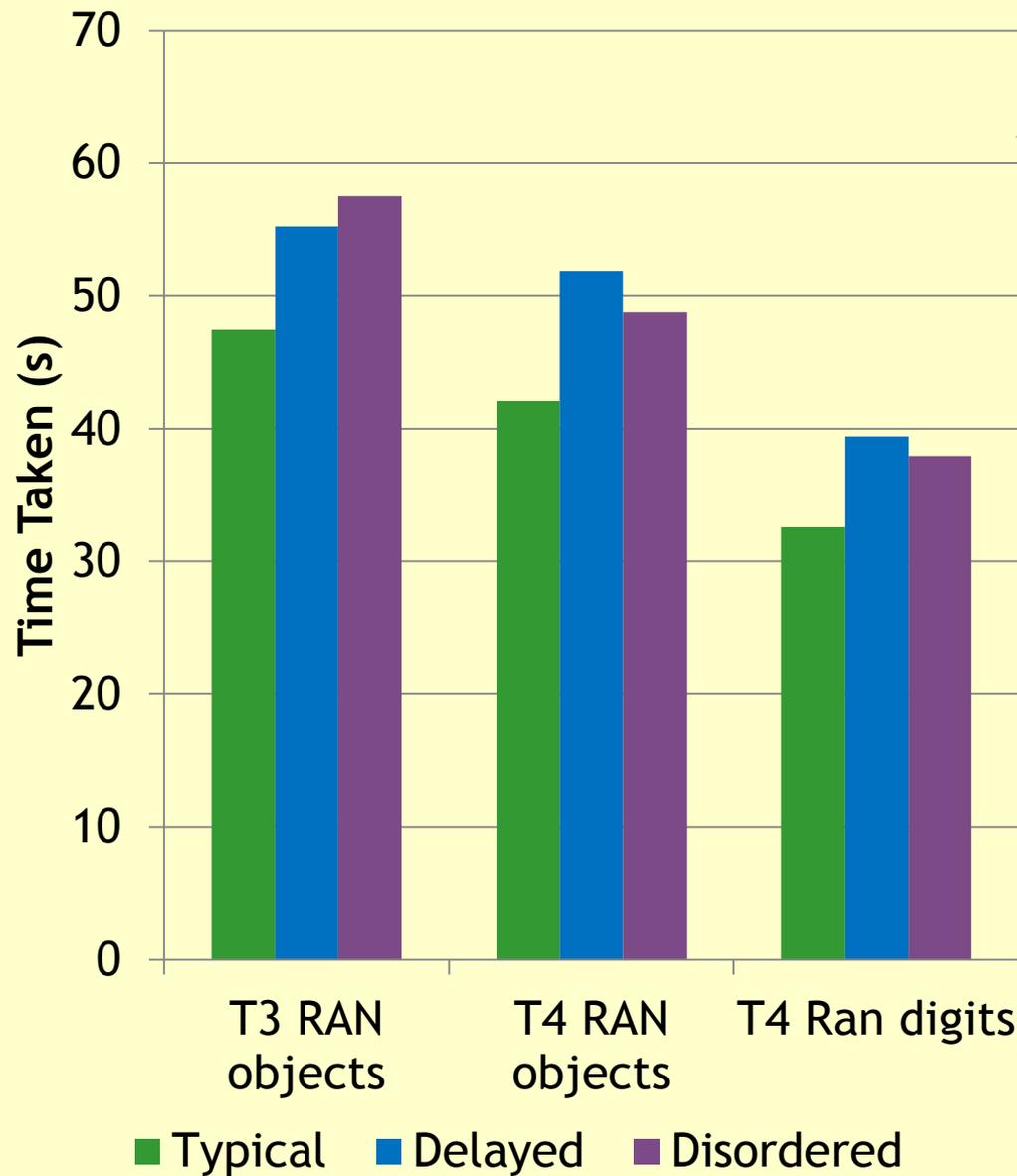


Both speech impaired groups have impaired phonological awareness
Remains significant after controlling for language status

Rapid Naming

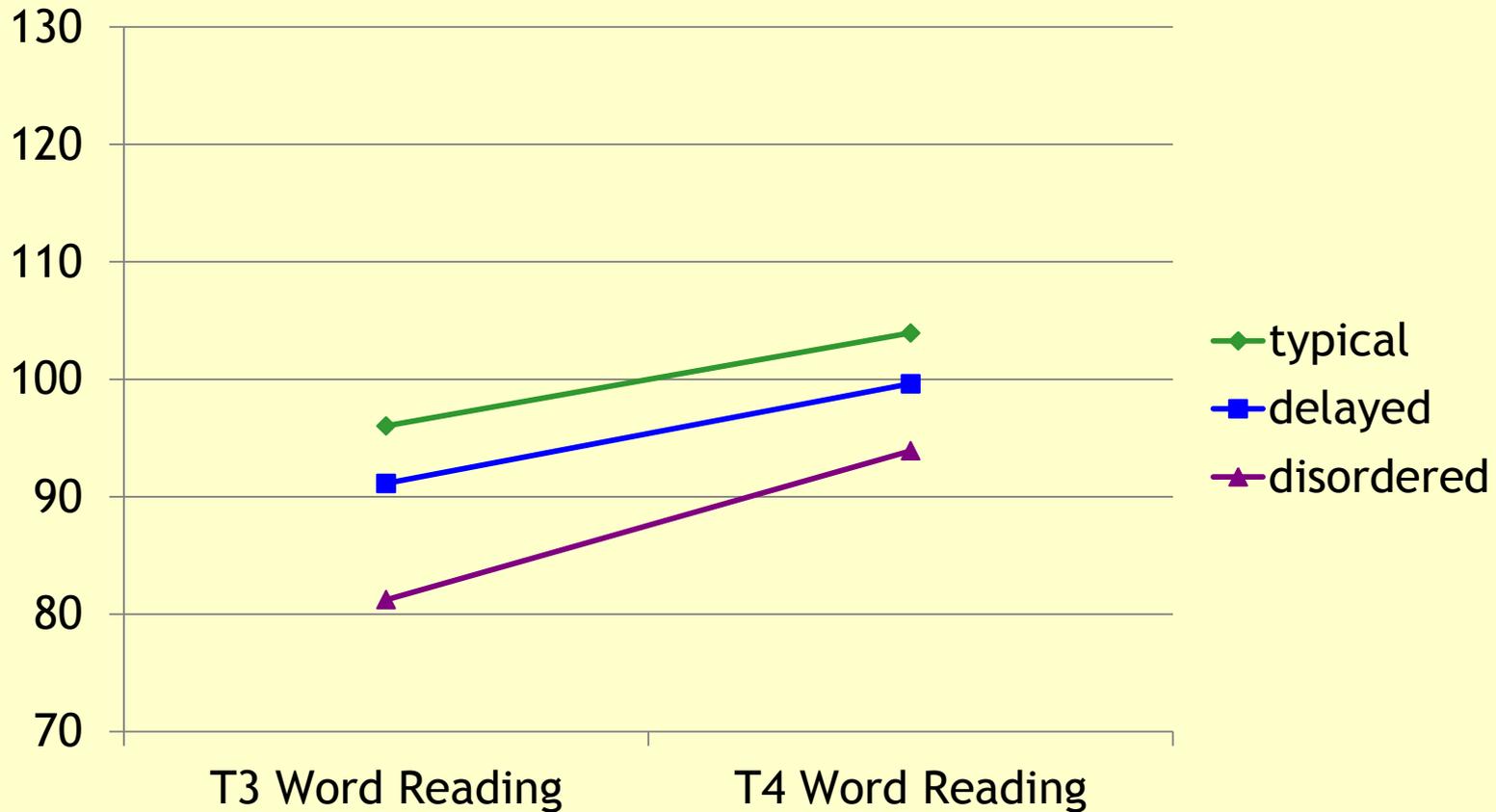
In RAN, both speech impaired groups were below controls

Including language status made no difference to the results



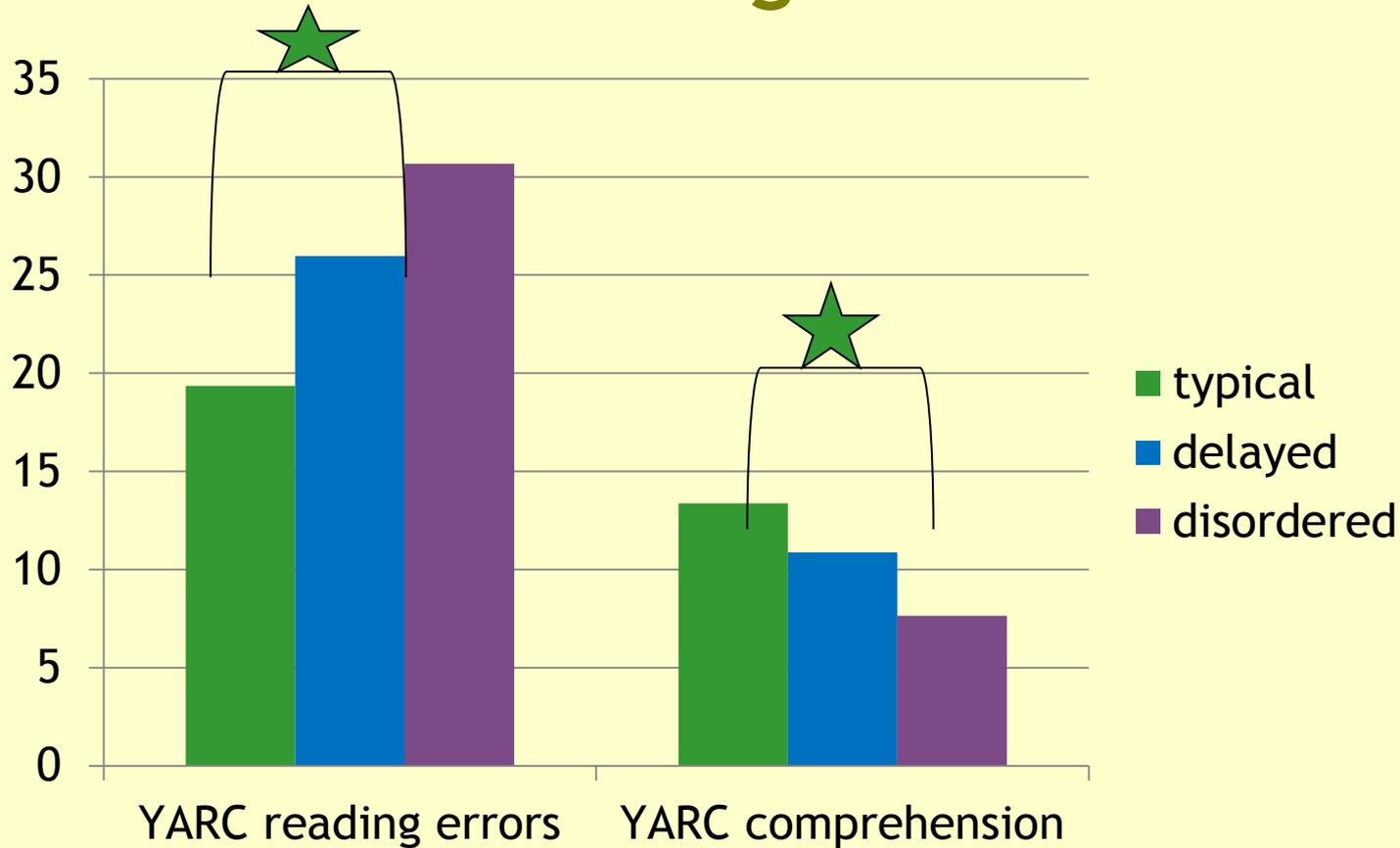


Speech Sound Disorder and Word Reading



In word reading, disordered group were below controls
Differences dropped out of significance once language group was controlled

Speech Sound Disorder and Passage Reading Time 4



In text reading accuracy and comprehension, disordered group were below controls

Controlling for language reduced the significance level (comprehension: $p=.07$) but an effect remained on text reading accuracy



Summary - Speech Sound Disorder

- Speech sound disorder was a frequent diagnosis at T1
- It was associated with language impairment, but not FR once language impairment had been controlled
- Children with delayed and disordered speech showed poorer phonological awareness and RAN
 - Not explained by language status
- Children with disordered speech showed lower literacy outcomes, though effects reduced when language was controlled



Conclusions

- Does speech sound disorder predict later difficulties?
 - Yes, in phoneme awareness and RAN
 - Yes, in literacy, but to a lesser extent
 - Perhaps only children with PA and RAN deficits show literacy deficits?
- Do children with disordered speech show poor literacy while children with delayed speech show average literacy?
 - Yes
 - But could be explained by severity of the disorder