



Outline

- What are the key messages from ELVS?
- What are the implications of the research for
 - practitioners
 - policy and programs
- What are the next steps to translate this research into action?

Early Language in Victoria Study (ELVS)

A prospective study of the evolution of language impairment and literacy problems across the first 7 years of life



1,910 8-month olds recruited in 2003/04

- by MCH nurses at routine 8/10 month visit
- at hearing screening sessions

Funded by the National Health and Medical Research Council
NHMRC 2003-7, 2007-10

ELVS - Data collection points

Q : parent-report questionnaire
A : face-to-face assessment

ELVS is measuring

- Language & communication
- General development & health
- Family history
- Socio-demographic details
- Mental health & family stress factors
- Parent-child interactions
- Child behaviour & temperament



Cohort characteristics

- n=1910
- 50.5% male, 49.5% female
- 6% (127) LBOTE
 - approximately 50 different languages spoken
- 3.1% (60) premature (<36 weeks)
- 2.8% (54) twins



Snapshot at 2 and 4 years of age

**Predictors
Co-morbidities
Trajectories**

Expressive vocabulary at 2 years

n = 1742

	Mean	SD	Range
Total	261.3	162	0 - 679
Girls	287.7	159.7	0 - 679
Boys	234.7	160.6	0 - 679

* MB-CDI: Fenson et al, 1994
(Reilly et al Pediatrics 2007; Reilly et al JSLP 2009)

Late talkers* at 2 years

19.7% (n = 333)

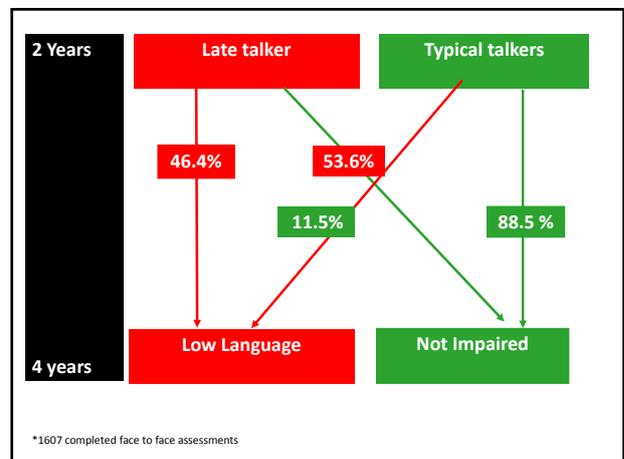
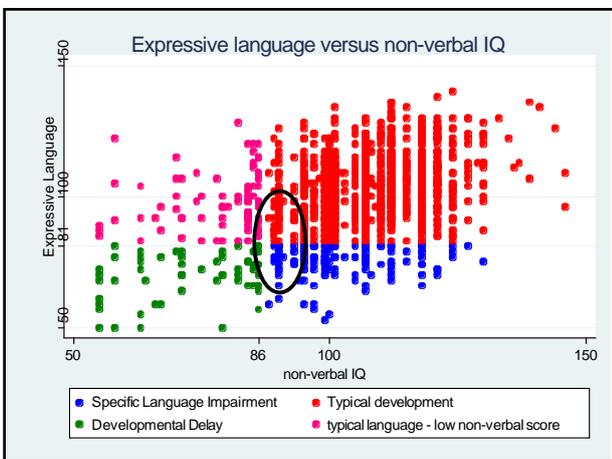
Average words < 79: 39
Average Words < 119: 65

* MB-CDI: Fenson et al, 1994
(Reilly et al Pediatrics 2007; Reilly et al JSLP 2009)

Snapshot at 4 years

Low Language	Non-Verbal Performance	Specific Language Impairment *
324/1573 (20.6%)	150/1595 (9.4%)	251/1462 (17.2%)
> -1.25 SD ≤ 81	scored < 85 or > -1.25 SD**	NV-P: > 1.25 SD and Low Language (> -1.25 SD)

*Exclusions: ASD (n = 19), NESB, HL (late diagnosis of Hearing loss)
** 150 children (9.4%) scored more than -1.25 SDs



SO.....

1 in 2 late talkers catch up

We just have to work out which ones don't

AND.....

Late talking (delayed expressive vocabulary) is only one pathway to Low Language and SLI.

Factors hypothesised to influence language outcomes

- Gender
- Twin Birth
- Pre-term birth (<36 weeks)
- Birth weight (kg)
- Birth order
- Non-English speaking background
- Maternal education
- Socio-demographic status (Australian Bureau of Statistics SEIFA)
- Family history of speech/language difficulties
- Maternal mental health (Kessler Screen)
- Maternal vocabulary score (Mill Hill vocabulary score)
- Maternal age at birth of child

Nelson et al 2006
US Preventative Services Taskforce

Predicting late talking, low language and SLI*

* Logistic regression

	2 Years		4 years			
	Late talkers	Low language		Specific Language Impairment		
		Receptive	Expressive	Receptive	Expressive	
NESB	Yes	Yes	Yes	-	-	
Family History	Yes	Yes	Yes	Yes	Yes	
Maternal Education	Yes	Yes	Yes	Yes	Yes	
Male sex	No	Yes	Yes	Yes	No	
Birth weight	No	Yes	Yes	No	No	
SEIFA (disadvantage)	No	Yes	Yes	Yes	Yes	
Maternal Vocabulary	No	Yes	Yes	Yes	No	

Interpreting the findings

- Significant predictor variables explained the following variance in language outcomes at 4 years:
 - 20.2% Core
 - 20.9% Expressive
 - 18.9% Receptive
- Non-significant predictor variables:
 - twin birth; pre-term birth; maternal mental health
- Late talking Status at 2 yrs was a significant predictor and increased variance explained to 23.6% (core), 30.4% (expressive) and 27.9% (receptive)
- 4-5% variance explained in late talking at 2 years

Co-Morbidity Measures

Behaviour

- Strengths & Difficulties Questionnaire

Physical Health

- Special Health Care Needs – CSHCNS (Children with Special Health Care Needs Screener)*
- Physical functioning – Pediatric QoL (PEDSQL 4.0)

Communication

- Speech, Fluency and pre-literacy

*collected in 5 year questionnaire for health care needs in previous 12 months

Co-Morbidity – Behaviour at 4 years

	Low Receptive Language (N=231)	Low Expressive Language (N=177)	Typical Language (N=1273)
Behaviour-SDQ Total Difficulties			
Normal	68.4%	69.5%	84.1%
Borderline	12.1%	13.0%	8.2%
Abnormal	19.5%	17.5%	7.7%

* group differences significant at <0.001

Children with Low Language had significantly higher composite scores on Hyperactivity and Peer Problems but did not differ on Emotional Symptoms, Conduct Problems or the Prosocial Scale from the non-impaired group.

Co-Morbidity – Development at 5yrs

	Low Language (N=128-136)	Typical Language (N=779-803)
Gross motor delay**	9.8%	2.1%
Fine motor delay**	17.2%	3.2%

**<0.001 significant difference



Co-morbidity: Low language at 4 and 5 yrs

Children with low language scores at 4 yrs:

- Have an associated increased risk for:
 - other communication problems,
 - motor delays,
 - behaviour problems
- They have greater
 - need for special health care services
 - poorer early literacy skills (e.g.: letter knowledge)
 - 44% children with LL at 4 year could name any letters



Trajectories

Trajectories or pathways to language outcomes

- Late starters
- Accelerators
- Late bloomers



Different approach (latent class analysis)

Typical - development in the typical range at each age

Precocious (late) - typical development in infancy followed by high probabilities of precocity from 24 mths onwards

Impaired (early) - delayed development in infancy followed by typical language development thereafter

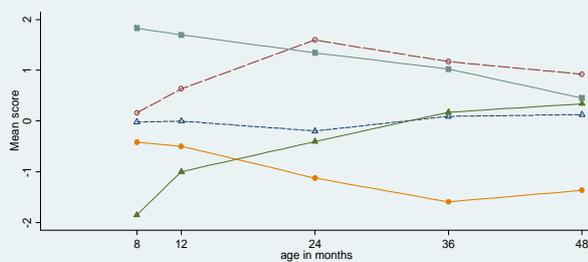
Impaired (late) - Typical development in infancy but delayed from 24 mths onwards

Precocious (early) - high probabilities of precocity in early life followed by typical language by 48 mths

Okoumunne et al 2011

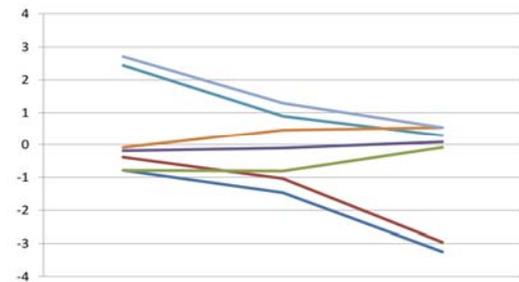


Mean language score 8 months to 4 years



---△--- Typical (N = 837) -○- Precocious - late (N = 112)
 -▲- Impaired - early (N = 69) -●- Impaired - late (N = 53)
 -■- Precocious - early (N = 42)

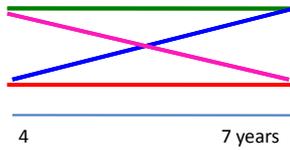
Trajectories - expressive vocabulary



Roulstone et al 2010



And between 4 and 7 years.....



Language Imp at 4yo & 7yo (n=111)
 NOT Language Imp at 4yo or 7yo (n=857)
 Language Imp at 4yo & NOT at 7yo (n=70)
 NOT Language Imp at 4yo & Imp at 7yo (n=95)

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Summary of what we know?

Early identification/natural history

- High prevalence condition (1 in 5 have LL)
- Adverse outcomes
- 'Unstable early pathways' – considerable fluidity
- Activation and acceleration rates vary
- Strong biological influence on early communication and vocabulary development
- Social disadvantage helps explain increased variation in language outcomes by 4 years.
- Late talking at 2 years was a strong predictor of language outcome at 4 years BUT poor sensitivity and specificity

Summary of what we know? (cont.)

Low Language

- Tends not to occur in isolation
- Associated with high rates of co-morbidity including:
 - Other communication related problems
 - Social, emotional and behavioural problems
 - Higher service utilisation rates

Associations strongly evident in a community sample where severity of language difficulty is known to be less than in clinical samples and fewer families have sought help

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Houston we have a mismatch

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"So, does anyone else feel that their needs aren't being met?"

T E N S I O N

Services

Designed to respond to red flags often at single detection points

Speech Pathologists trained to do above

Knowledge

Should we focus on pathways/trajectories?

Focus on S&L and overlapping co-morbidities

Early identification

- Clear that the early and reliable identification of language delay under 2 years of age is problematic in all but the most severe cases.
- Cant just be early

What does this mean?

- Surveillance rather than screening approach may be required
- Language development vulnerable to further disruption
- While sobering, offers a fairly prolonged window of early childhood during which these impacts could be genuinely prevented, rather than simply ameliorated
- How to extend surveillance to identify those with problems that emerge at 4 or 7 years

Clinical and research dilemma

Is SLI a distinct phenotype

Community level

- Translate improvements into population benefit
- Timing:
 - 2 years might be too early to detect language delay
 - up to 70% of false positive
 - low sensitivity results in false negatives
 - School entry might be too late
 - Language delay becomes less treatable
 - 4 - 5 years as ideal window
 - Language delay is more stable and more reliably detected
 - Children may be more amenable to treatment

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Service delivery

- How are our services designed and organised?
- Are they able to react to, and adapt to new information?
- How could we better organise early surveillance



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