

# Professor Sheena Reilly

# EARLY LANGUAGE IN VICTORIA STUDY (ELVS)

## An overview of the study and selected results

- The sampling framework, recruitment, methods and procedures
- Summary results from early waves
- Main outcomes at 4 years



# The ELVS Team



Professor Sheena Reilly (CI)  
Professor Edith L. Bavin  
Dr Lesley Bretherton  
Professor John Carlin  
Professor Anne Castles  
Dr Patricia Eadie  
Professor Margot Prior  
Dr Obioha Ukoumunne  
Professor Melissa Wake  
Dr Joanne Williams

*Postdoctoral fellow:*

Dr Jemma Skeat

*Research Assistants:*

Madeline Armstrong, Cherylee Brown, Petrea Cahir, Eileen Cini, Laura Conway, Lucy Donovan, Lauren Pigdon, Lisa Quinn, Kerry Ttofari-Eecen, Samantha Turner, Carly Veness, Amy Watts

+ Doctoral students



# ELVS – Overall Aims

1. Describe and quantify early predictors of language impairment
2. Identify early co-occurring conditions with language impairment



Funded by the NHMRC 2003-7, 2007-10

# ELVS – Methods

- **Prospective**
- **Longitudinal**
- **Community sample**
- **Self-report and questionnaires**
- **Direct assessment**

# ELVS – Sample

- **1,910 infants**
- **Recruited at 8-10 months of age**
- **Via Maternal & Child Health (MCH) Nurses, local newspapers, and MCH Universal Hearing Screenings**
- **6 Melbourne metropolitan local government area (LGAs) stratified by SES**

Maroondah & Whitehorse (high)

Banyule & Brimbank (middle)

Whittlesea & Casey (low)

# ELVS is measuring

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

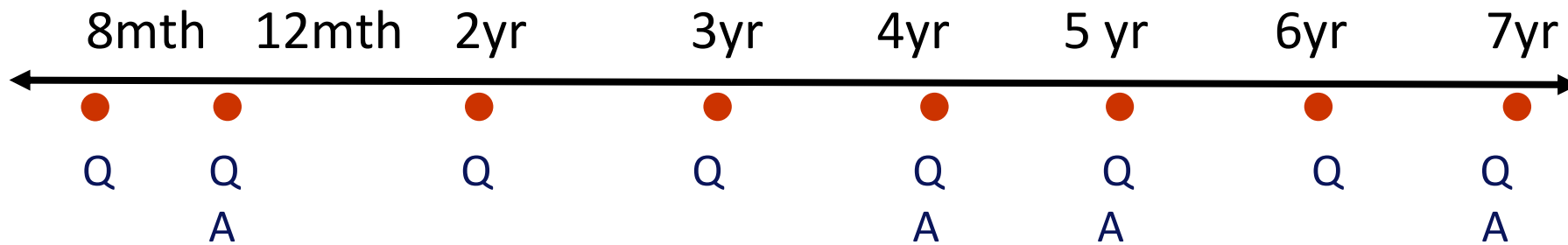
# Data Collection Points



Age at recruitment



Current age



Q : parent-report questionnaire

A : face-to-face assessment

# Flowchart of Participants

<b>Wave 1: Participants at Baseline</b> 8 months N = 1910
<b>Wave 2: Participants at 12 months</b> N = 1760 (92.1%)
<b>Wave 3: Participants at 24 months</b> N = 1742 (91.1%)
<b>Wave 4: Participants at 3 years</b> N = 1648 (86.2%)
<b>Wave 5: Participants at 4 years</b> N = 1624 (85%) Completed questionnaires N = 1607 (84.1%) Face-to-face assessment

# Cohort Characteristics

- **N = 1910**
- **50.5% male, 49.5% female**
- **3.1% (60) premature (<36 weeks)**
- **2.8% (53) non-singletons**
- **6% (127) speak a language other than English in the home (~ 50 different languages spoken)**

# Participant Characteristics

Variables	Baseline Sample	4 Year Sample
	N = 1910	N = 1602
Female gender	49.5%	48.6%
Non-English-speaking background, %	6.6%	5.6%
Maternal education level		
<=12 years, %	22.8%	21.0%
13 years, %	40.1%	40.7%
degree/postgraduate, %	37.0%	38.3%
SEIFA disadvan. mean (sd)	1036 (61)	1038 (59)
Fam. history speech/language difficulties, %	24.9%	25.1%
Maternal mental health problem, %	31.7%	31.8%
Maternal vocabulary score, mean (sd)	27.5 (5.1)	27.7 (4.9)
Maternal age - birth of child, yrs, mean (sd)	31.1 (4.5)	31.3 (4.4)

# Language Measures at 2 & 4 Years

## *2 Years of Age*

**MacArthur-Bates Communicative Development Inventories (CDI)  
Words & Sentences Form (16 – 30 months)**



## *4 Years of Age*

**Clinical Evaluation of Language Fundamentals Preschool  
Second Edition (CELF P-2) Australian Adaptation (3;0 –  
6;11 years)**

**Provides Standardised Core, Receptive &  
Expressive scores**



# At 2 years

- How many children are late talkers at 2 years of age?
- Can late talking be predicted?

# Vocabulary at 2 years of age

Expressive vocabulary (MB-CDI: Fenson et al, 1994)

	Mean	SD	Range
<b>Total</b>	261.3	162	0 - 679
<b>Girls</b>	287.7	159.7	0 - 679
<b>Boys</b>	234.7	160.6	0 - 679

**Late talkers - at risk for language impairment:**

**< 10th centile CDI: 19.7% (*n* = 333)**

*[<119 words for girls and < 79 for boys]*

*(Reilly et al Pediatrics 2007; Reilly et al IJSLP 2009)*

# Combining words at 2 years of age

<b>Not using word combinations</b>	
<b>Total</b>	287 (17%)
<b>Girls</b>	105 (12.6%)
<b>Boys</b>	182 (21.2%)

<b>Low vocabulary and no word combinations</b>	
<b>Total</b>	184 (10.8%)
<b>Girls</b>	71 (4.2%)
<b>Boys</b>	113 (6.6%)

# Potential predictors

- Gender (male)
- Twin birth, prematurity, birth weight
- Birth order
- Socioeconomic status
- Family history of speech/language difficulties
- Parental education & age at child's birth
- Minority status (NESB)
- Maternal mental health
- Maternal vocabulary

*Based on Nelson et al 2006*

# Early predictors

- **Strong concordance between 8, 12 & 24 month findings**
- **Only three factors (*being male, a family history of speech and language problems and a non-English speaking background*) were associated with late talking at 2 years.**

# Summary of findings from the Early Waves

- Strong biological trajectory (*largely unaffected by social, family and environmental factors*) for development of communication skill and vocabulary production in first 2 years
- Communication skill level already achieved at 12 months of age was a much better predictor of outcome at 24 months than the predictors/risk factors collectively

# Late Talkers: What are the options?

- Watch and wait
- Intervention for all
- Targeted interventions

# Outcomes at 4 years

- How many children were language impaired?
- Can language impairment be predicted?
- How many late talkers at 2 years have language impairment at 4 years?
- What other development and health morbidities?

# Language outcomes at age 4 years

	Low Language*	Specific Language Impairment**
No impairment	1249 (80.1%)	1151 (86.4)
Expressive only	62 (4%)	49 (3.7%)
Receptive only	106 (6.8%)	75 (5.6%)
Exp & Rec	142 (9.1%)	57 (4.3%)

N= 1559

N= 1332

\* Low language - > -1.25 SD

\*\* SLI – Low Language. Does not include NESB or children with low K-Bit-2 score

# How many Late Talkers have SLI at 4?

	Late Talkers N (%)	Non-Late Talkers
No impairment	135 (60.5%)	993 (91.4%)
Expressive	31 (13.9%)	16 (1.5%)
Receptive	20 (9.0%)	50 (4.6%)
Expressive/Receptive	37 (16.6%)	28 (2.6%)
Total impaired at 4 years	(39.9%)	(8.7%)

# Predicting Late Talking, Low Language & SLI

	2 years	4 years			
	Late Talker	Low Language		SLI	
Predictor		Expressive	Receptive	Expressive	Receptive
Gender	✓	✓	✓		✓
Birth weight		✓	✓		
Birth order					
NESB	✓	✓	✓	-	-
Mat education		✓	✓	✓	✓
Maternal vocabulary		✓	✓		✓
Family history	✓	✓	✓	✓	✓
SEIFA (SES disadvantage)		✓	✓	✓	✓
Mother's age					

# What predicts Low Language (LI) at 4?

Base line predictors accounted for:

18.9% of the variance for receptive language scores  
and 20.9% for expressive scores (continuous  
variable)

Adding LT status increased variance accounted for  
23.6 and 30.4%

# Co-morbidity – communication disorders

	Low Language	Normal Language
Articulation	20.7%	7.8%
Stuttering	6.6%	12.7%
Knew no letters	44.8%	15.9%

# Development and health morbidities

	Low Language	Normal Language
Gross motor delay	9.8%	2.1%
Fine motor delay	17.2%	3.2%
Personal social	9.6%	2.3%
Behaviour problems	9.6%	3.8%
HRQoL		
Physical functioning	11.2%	8.2%
Psychosocial Health	17.2%	9.6%

# Autism Spectrum Disorder Study<sup>1</sup>

Compared the early social and communicative development of children identified with ASD to:

- children with developmental delay (DD),
- children with SLI &
- typically developing (TD) children

- at 8 months, 12 months & 24 months of age

**At what age can we identify reliable and consistent early signs of ASD to differentiate them from the other groups?**

*Veness et al 2009 Paper presented at APAC09, Sydney, Aug 2009*

*Veness et al 2010 In press*

# Participants

## ***ASD children*** (n = 18)

diagnosed by experienced clinician or autism diagnosis team by the age of 4 years

## ***DD children*** (n = 16)

$\leq 1.25$  SDs below on KBIT-2 & CELF-P2 and/or clinical diagnosis of DD from a clinician

## ***SLI children*** (n = 20)

random sample: normal range on KBIT-2 &  $\leq 1.25$  SDs below on CELF-P2

## ***TD children*** (n = 60)

random sample: normal range on KBIT-2 & CELF-P2

# Results: Parent Concern

PEDS: 'some concern' on any of questions addressing speech, understanding, behaviour or social ability

<b>PEDS Concern</b>	<b>ASD</b>	<b>DD</b>	<b>SLI</b>	<b>TD</b>
8 months	33.3%	25%	15%	23.3%
12 months	35.3%	33.3%	15%	16.7%
24 months	70.6%	40%	25%	28.3%

# ASD - Summary of findings

- At 8 months: No markers to distinguish groups
- Early social communication skills differentiated ASD from TD at 12 & 24 months
- Early Gestures at 12 months on the CDI & Gestures at 24 months on the CSBS were the only measures that differentiated ASD from DD/SLI/TD
- Need further research to reliably identify particular delays & deficits in infancy and toddlerhood that are predictive of autism

# Clinical & Public Health Implications

Early identification/differential diagnosis

- Biological trajectory influencing vocabulary outcomes at 2 years of age remained strong
- Measures of social disadvantage come into play and helped explain more variation in adverse language outcomes.
- Late talking at 2 years was a strong predictor of language outcome at 4 years,
- Few differences in Low Language and SLI at 4 years

# Late Talkers: What are the options?

- Watch and wait
- Intervention for all
- Targeted interventions

# Clinical & Public Health Implications

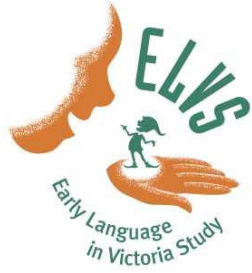
## Predictors

- Unlikely to be helpful in screening for language delay in the earlier years (< 2 years)
- More helpful in identifying children with Low Language by 4 years

## Recommendation

- Language promotion activities in infants younger than 24 months - universal or, if targeted, should be based on the level of communication skills displayed

# Questions



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# Measures

Parent report Questionnaires at 8, 12 & 24 months:

- Communication and Symbolic Behaviour Scale, Developmental Profile (CSBS DP) - Infant-Toddle Checklist (Wetherby & Prizzant)
- Macarthur-Bates Communicative Development Inventory (CDI): Words and Gestures (Fenson et al): completed at 8 and 12 months
- Parents Evaluation of Developmental Status (PEDS): Information on the child's developmental & family history

# Results: Sample Characteristics

	<b>ASD</b>	<b>DD</b>	<b>SLI</b>	<b>TD</b>
Gender (girls)	2 (11.1%)	4 (25%)	5 (25%)	39 (65%)
Twins	1 (5.6%)	1 (6.3%)	0	2 (3.3%)
Premature	2 (11.1%)	0	1 (5%)	2 (3.3%)
Family Hx*	6 (33.3%)	3 (18.8%)	9 (45%)	11 (18.3%)

Family history (mother, father, siblings) = late to talk;  
speech/language problems in childhood

No significant differences between groups, except for gender

# Late talkers at age 4

	Girls N=113	Boys N= 110
No impairment	63.7% (72)	52.3% (63)
Expressive only	15.0% (17)	12.7% (14)
Receptive only	7.1% (8)	10.9% (12)
Exp + Receptive	14.2% (16)	19.1 (21)

Also impaired at age 4:

7.2% of Non Late Talker girls and

10.1 % of Non Late Talker boys

# Distinguishing between Low Language and SLI

