



# Language development trajectories and risk factors for Speech, Language and Communication Needs

Professor Cristina McKean



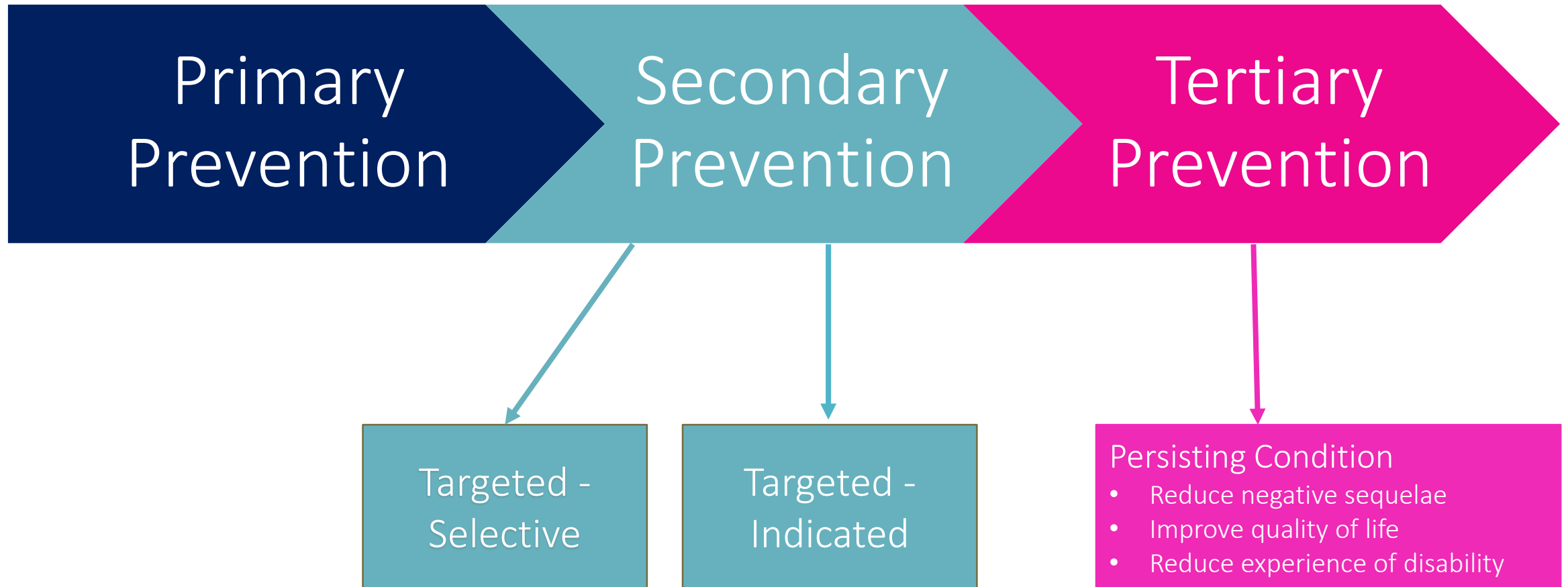
 @cristina\_mckean

Talk with Me Seminar 2021  
Children & Families Division – Welsh  
Government

- Why Child Language Trajectories?
- What have we learned and how does it inform....
  - Secondary Prevention
  - Tertiary Prevention
- Conclusions

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# Public Health – preventative intervention



# Trajectories and predictors – why bother?

- **Who** should receive intervention?
- How should we **identify** those individuals who need support?
- What are the potential **drivers** of different trajectories?
- **When** should we intervene?
- **How** should we intervene?



# Co-authors & cohorts

Millennium Cohort 2000 →



Language for Learning cohort  
Longitudinal Study of Australian Children



NE of England



Growing up in Scotland 2005 →



Early Language in Victoria Study 2003 →

## Collaborators

- Prof. Sheena Reilly
- Dr. Fiona Mensah
- Ass. Prof. Tricia Eadie
- Prof. Edith Bavin
- Prof. Margot Prior
- Prof. Melissa Wake

- Ms. Eileen Cini
- Dr. Laura Conway
- Dr. Fallon Cook
- Ass. Prof Lesley Bretherton
- Dr. Darren Wraith
- Kath Frazer SLT

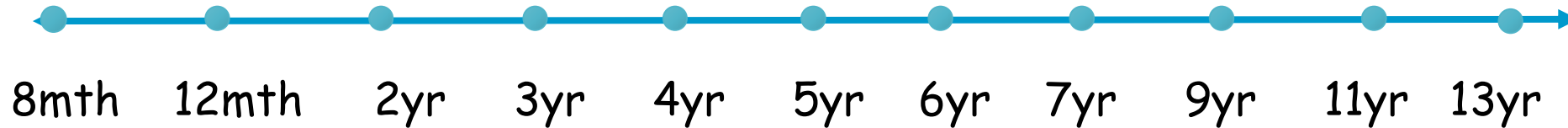
- Dr Penny Levickis
- Prof. Angela Morgan
- Dr. Liz Westrupp
- Prof. James Law
- Dr. Ange Pezic
- Dr Robert Rush



# Early Language in Victoria Study



Specialist longitudinal cohort (N = 1910)



- Metropolitan Melbourne
- Recruited across social gradient
- Exclude children with early diagnosed developmental disability & vlbw
- Exclude parents with insufficient English to fill in forms

- Why Child Language Trajectories?
- What have we learned and how does it inform....
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# Public Health – preventative intervention

Primary Prevention

Secondary Prevention

Tertiary Prevention

Pre-school

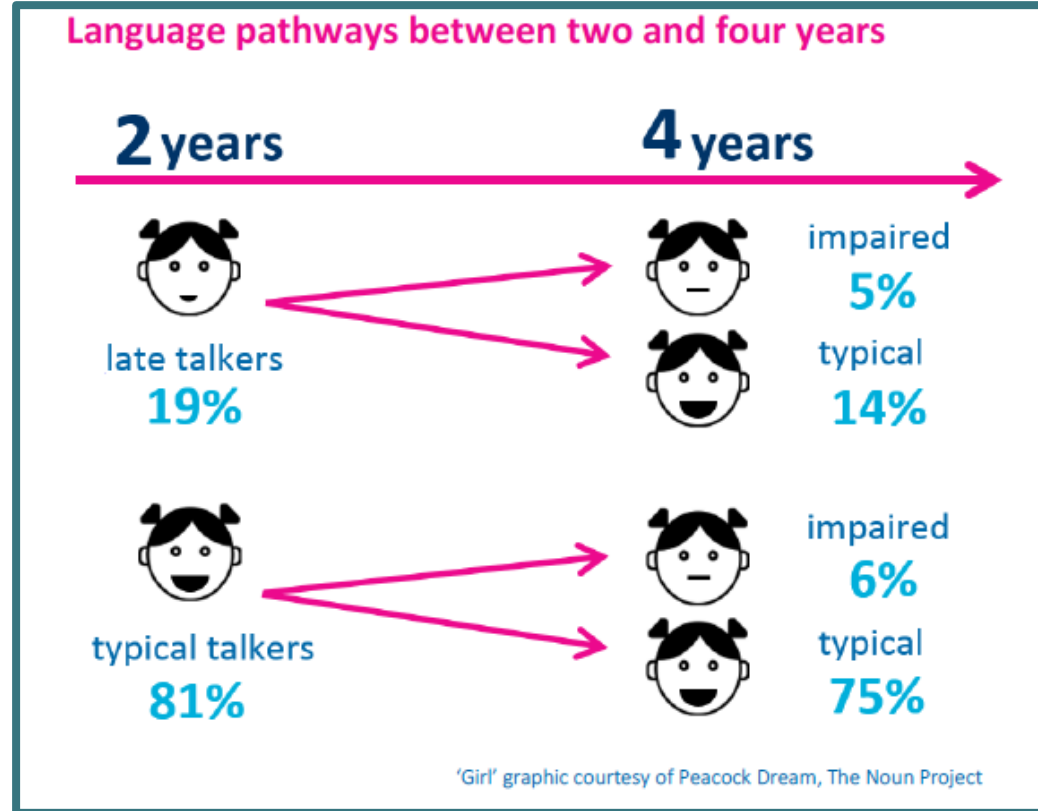
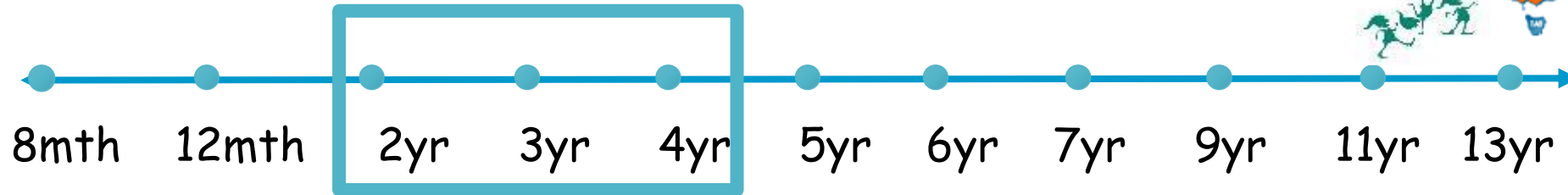
Targeted -  
Selective

Targeted -  
Indicated

Persisting Condition

- Reduce negative sequelae
- Improve quality of life
- Reduce experience of disability

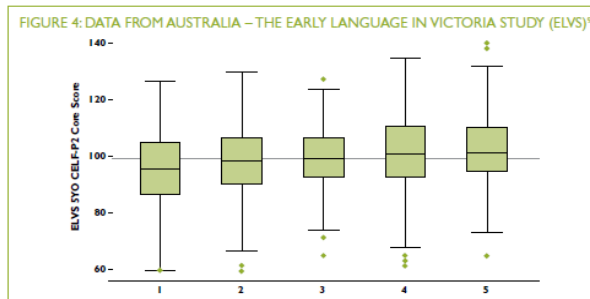
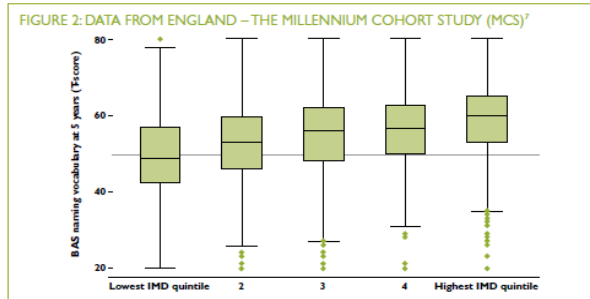
# Targeted indicated?



# Targeted selective?



EARLY LANGUAGE DELAYS IN THE UK

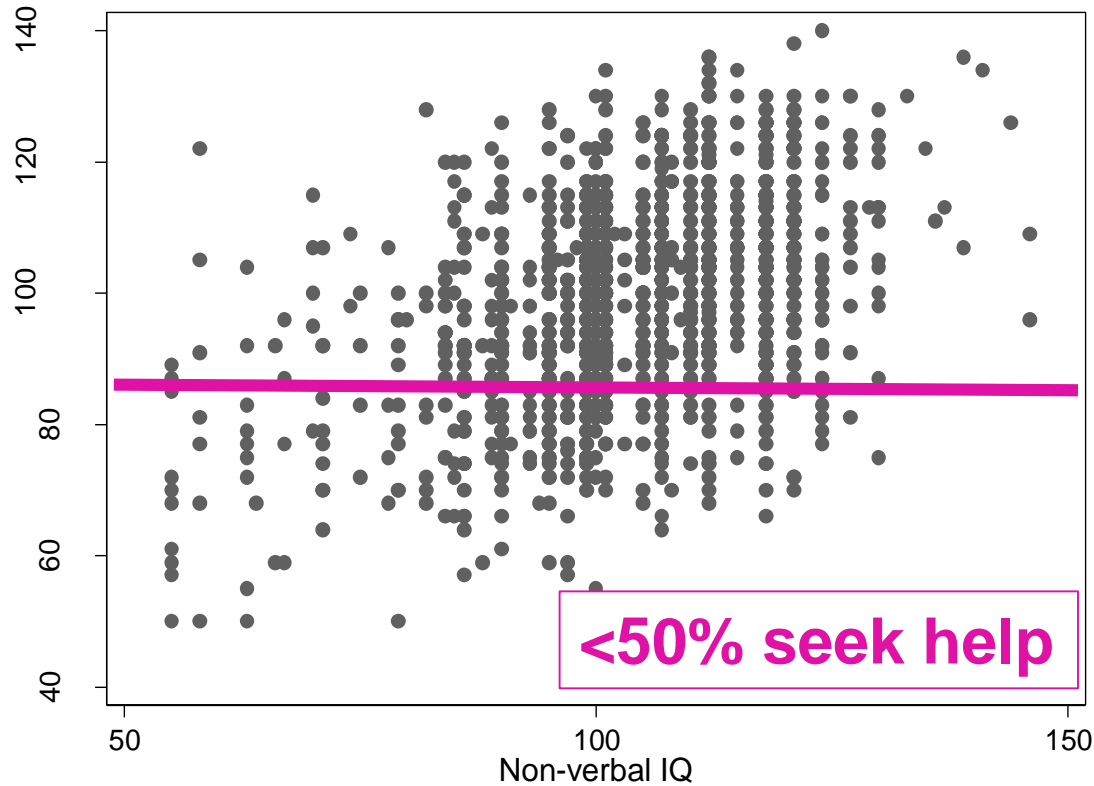


- A clear social gradient in language ability
- Trend replicated across cohorts internationally
- Social disadvantage important indicator of need for selective targeting but can't be ONLY method
- Children with language difficulties across the social spectrum

Prevalence of low language abilities at 5 years (> 1SD below mean)

Cohort	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Millennium Cohort Study	18	10	7	5	3
Growing up in Scotland	23	18	15	11	10
Early Language in Victoria Study	21	16	7	12	6

# Responsive?



Not only a social gradient in outcome but also in access to services

Gender and concerns regarding behaviour also predict 'help seeking'

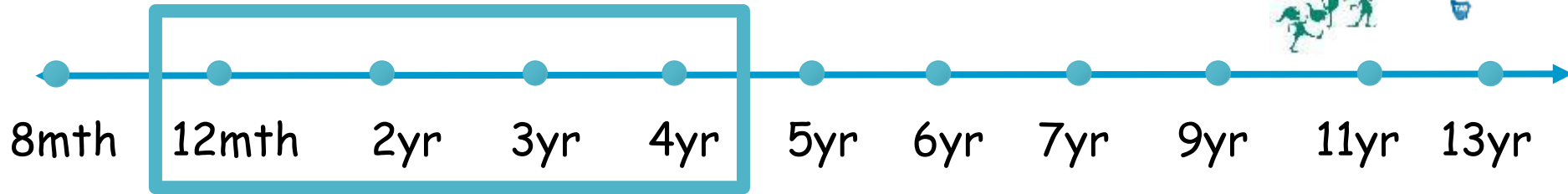
Responsive only models therefore have the potential to widen inequalities

Also miss opportunity for preventative interventions targeting 'mutable' determinants of child language – factors we can change to shift children's trajectories

Skeat, J., Wake, M., Ukoumunne, O. C., Eadie, P., Bretherton, L., & Reilly, S. (2014). Who gets help for pre-school communication problems? Data from a prospective community study. *Child: care, health and development*, 40(2), 215-222.

Skeat, J., Eadie, P., Ukoumunne, O., & Reilly, S. (2010). Predictors of parents seeking help or advice about children's communication development in the early years. *Child: Care, health and development*, 36(6), 878-887. [With thanks to Sheena Reilly for graph]

# An integrated approach?



What are most powerful **Child**, **Family** and **Parental** predictors at 12 months of language at 4 years?

Moderate predictor of school entry language skills  
 vocabulary at 4 years  
 Larger developmental gains than  
 measures at 12 months  
 Opens a 'theoretical window' for parents

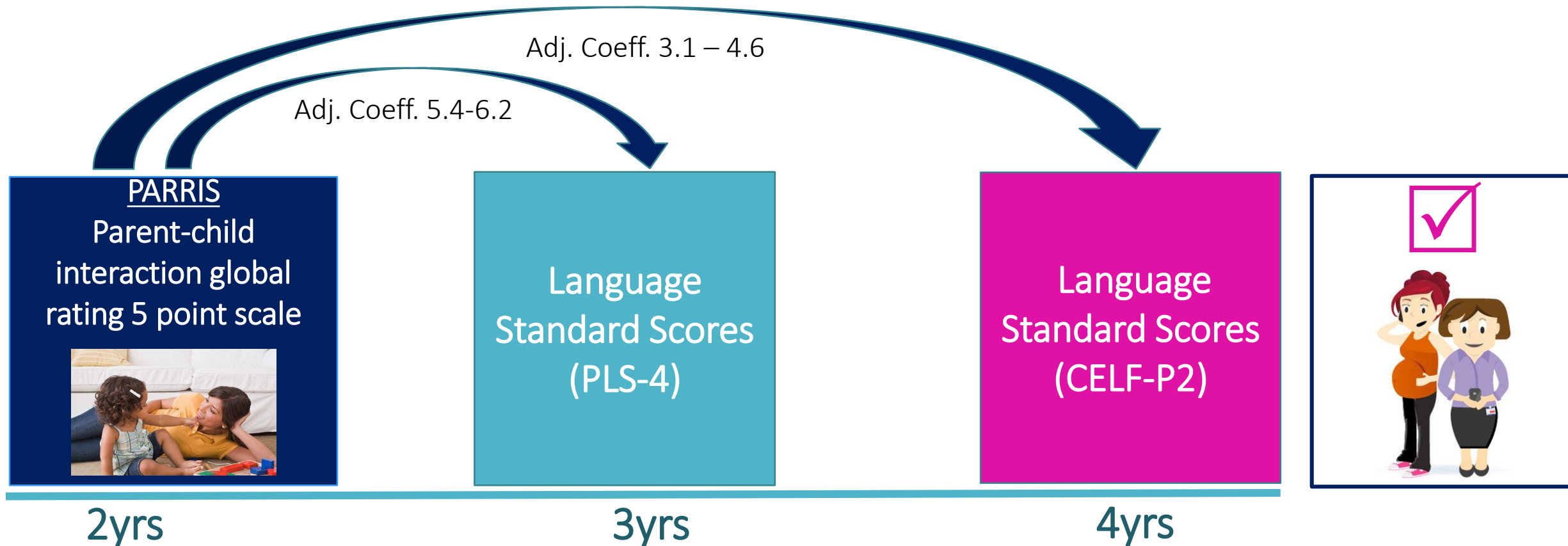


<b>Communication</b>	Showing objects
	Words/phrases understood
	Word used meaningfully
<b>Family Factors</b>	Family History
	Maternal Education
	SES quintile
<b>Parent Behaviour</b>	When child plays with a toy I talk about it

# An integrated approach?



Parental responsiveness in a cohort of 246 slow-to-talk toddlers – Dr Penny Levickis



Hudson, S., Levickis, P., Down, K., Nicholls, R., & Wake, M. (2015). Maternal responsiveness predicts child language at ages 3 and 4 in a community-based sample of slow-to-talk toddlers. *International Journal of Language & Communication Disorders*, 50(1), 136-142

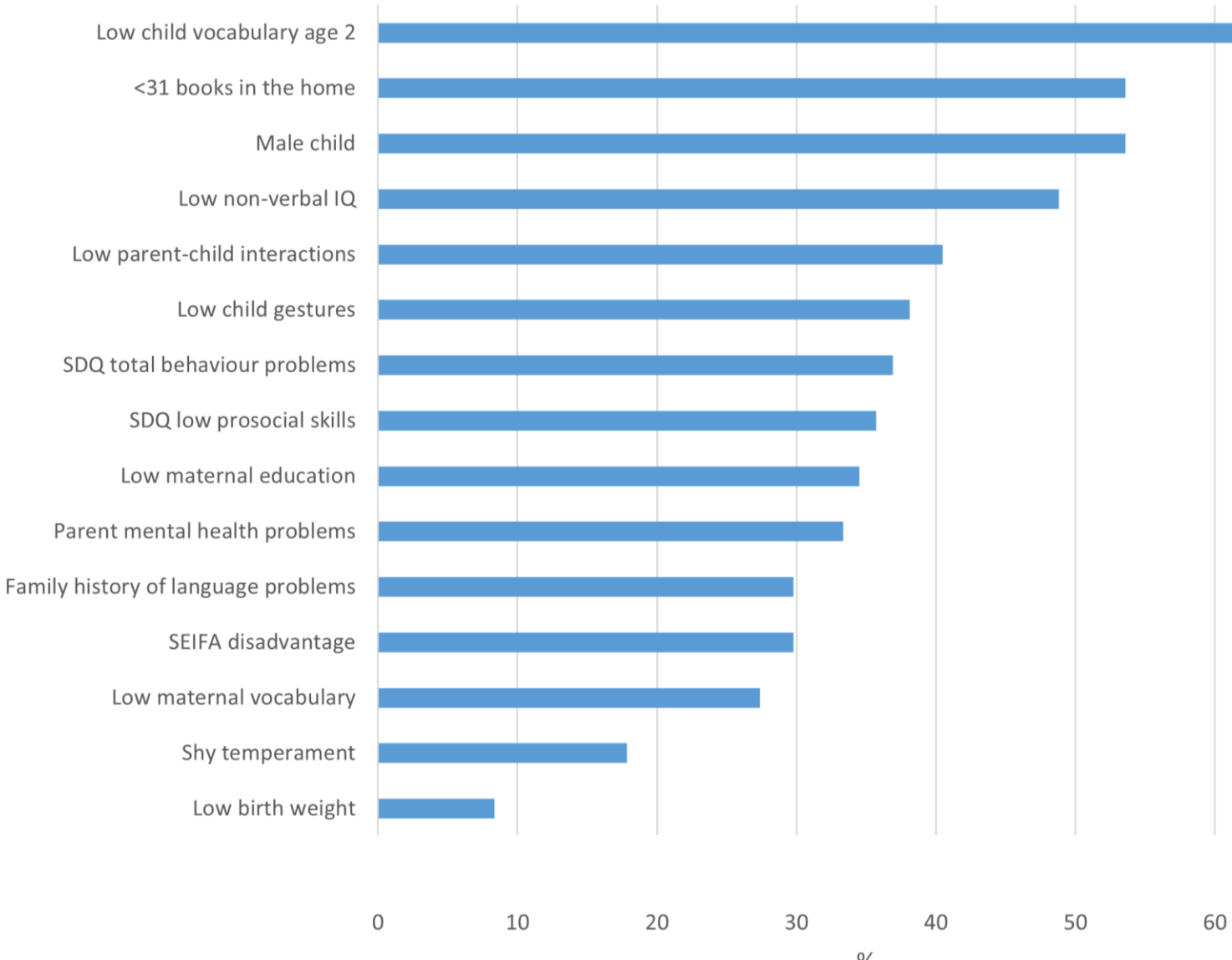
Levickis P, McKean C, Walls E, Law J. Training community health nurses to measure parent-child interaction: a mixed-methods study. *Eur J Public Health*. 2020 Jun 1;30(3):426-431

# An integrated approach?

What if we counted the number of risks children are exposed to?

.....their cumulative risk?

Here is the percentage of children with low language at age 7 with particular risks.



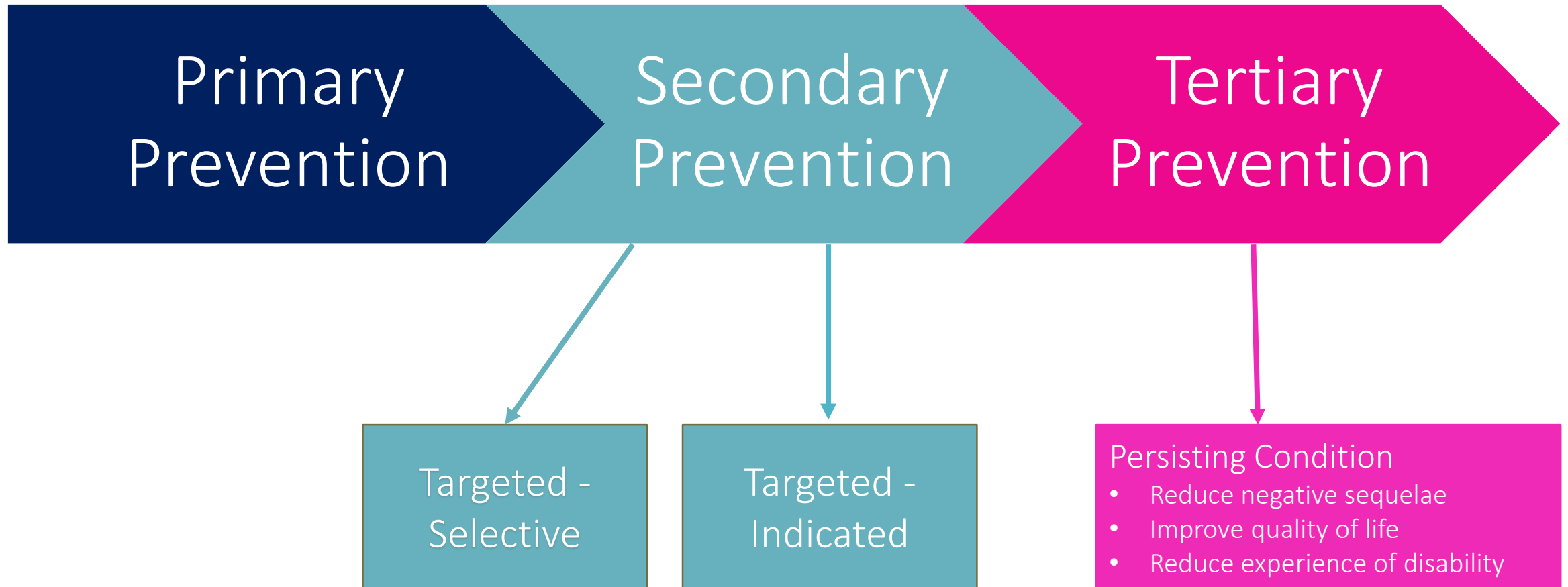
# Cumulative risk?

	Typical Language (N)	Low Language (N)	Total (N)	Low Language (%)	Risk ratios (95%CI), p
0-2 risks	323	5	328	1.52	
3 risks	171	9	180	5.00	3.28 (1.12 – 9.64), 0.03
4 risks	141	13	162	8.03	5.26 (1.91 - 14.51), 0.001
5 risks	120	15	135	12.50	7.29 (2.70 - 19.66), <0.001
6 or more	119	42	161	26.09	17.11 (6.90 - 42.42), <0.001
Total N	882	84	966	8.70	

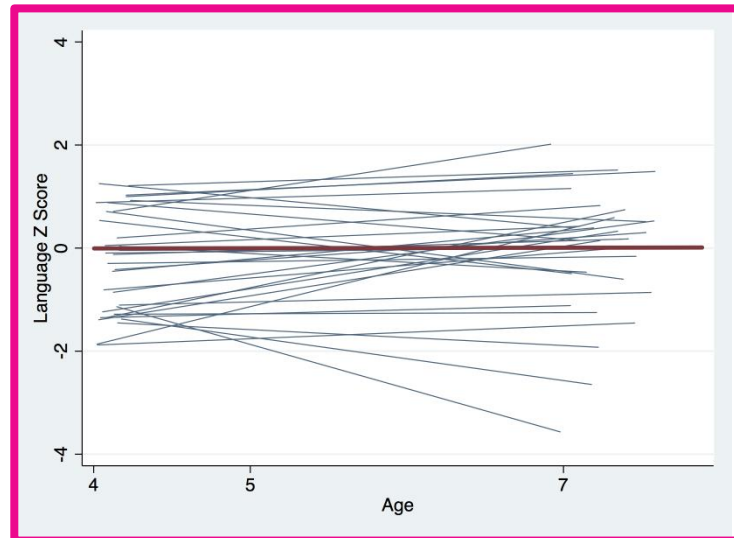
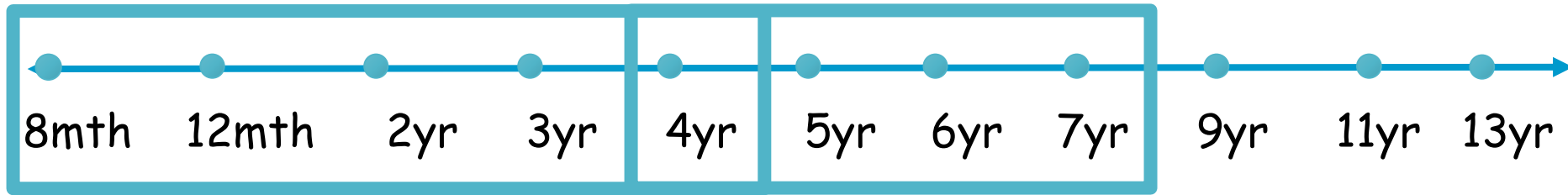
Number (%) of children with low language outcome at age 7 according to the number of risk factors and risk ratios



# Public Health – preventative intervention



# Factors which could be harnessed for interventions?

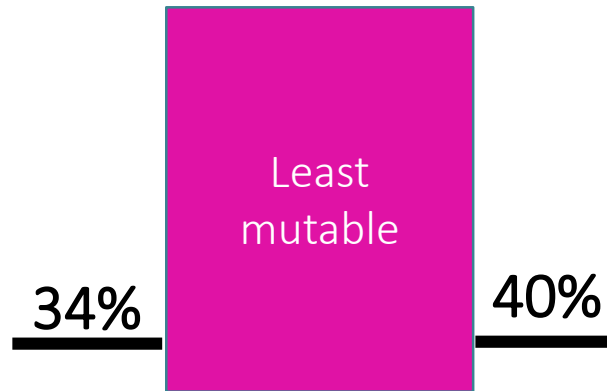


# Factors which could be harnessed for interventions?

## Factors which predict

....language at 4 yrs

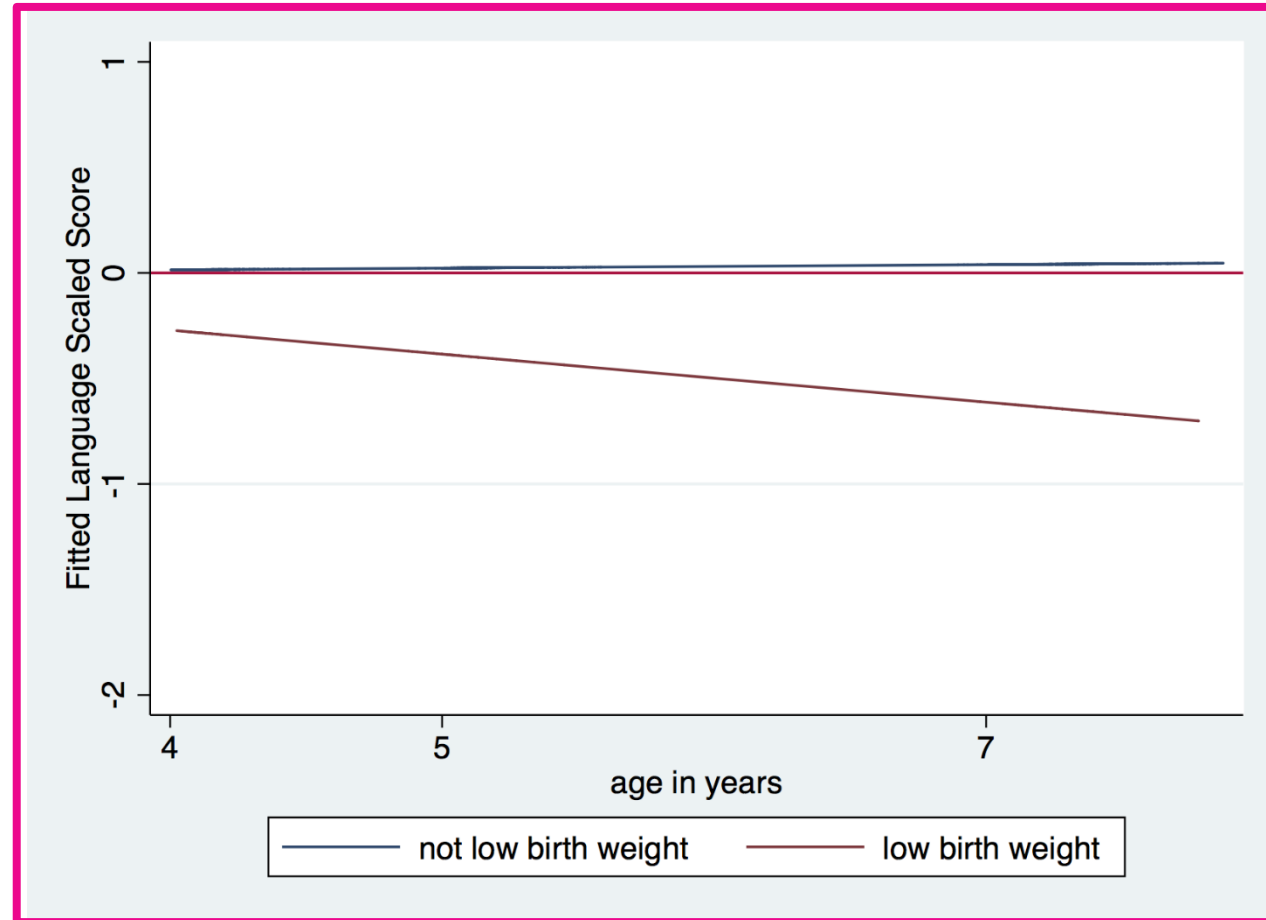
- Non-verbal IQ
- Family History
- Developmental Disorder
- Shy
- Non-English speaking background



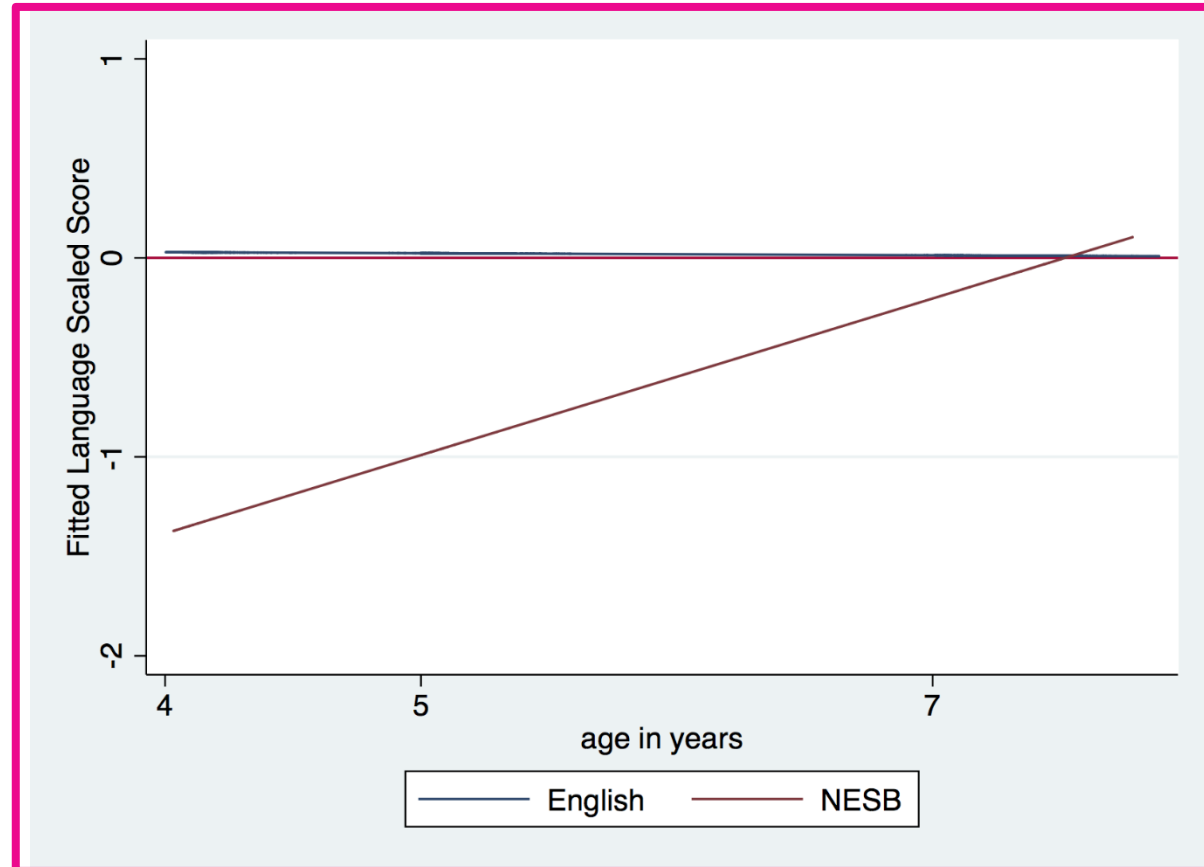
....slope between 4 and 7 years

- Low birth weight -ve
- Non English speaking background +ve

# Low birth weight



# Non-English speaking background



# Factors which could be harnessed for interventions?

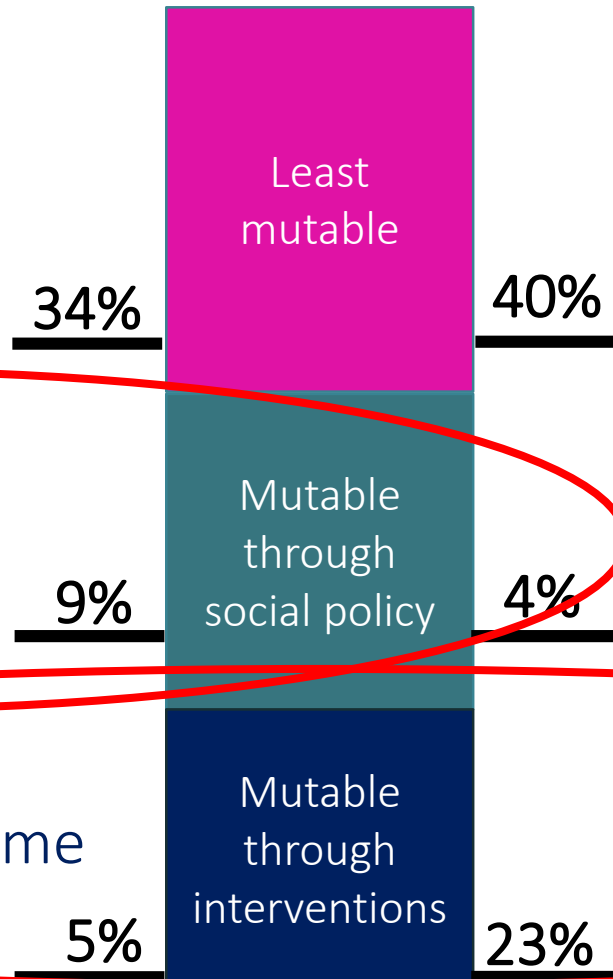
## Factors which predict

....language at 4 yrs

- Non-verbal IQ
- Family History
- Developmental Disorder
- Shy
- Non-English speaking background
- SES
- Income
- High birth position
- Family Literacy
- Frequency being read to
- Number children's books in home

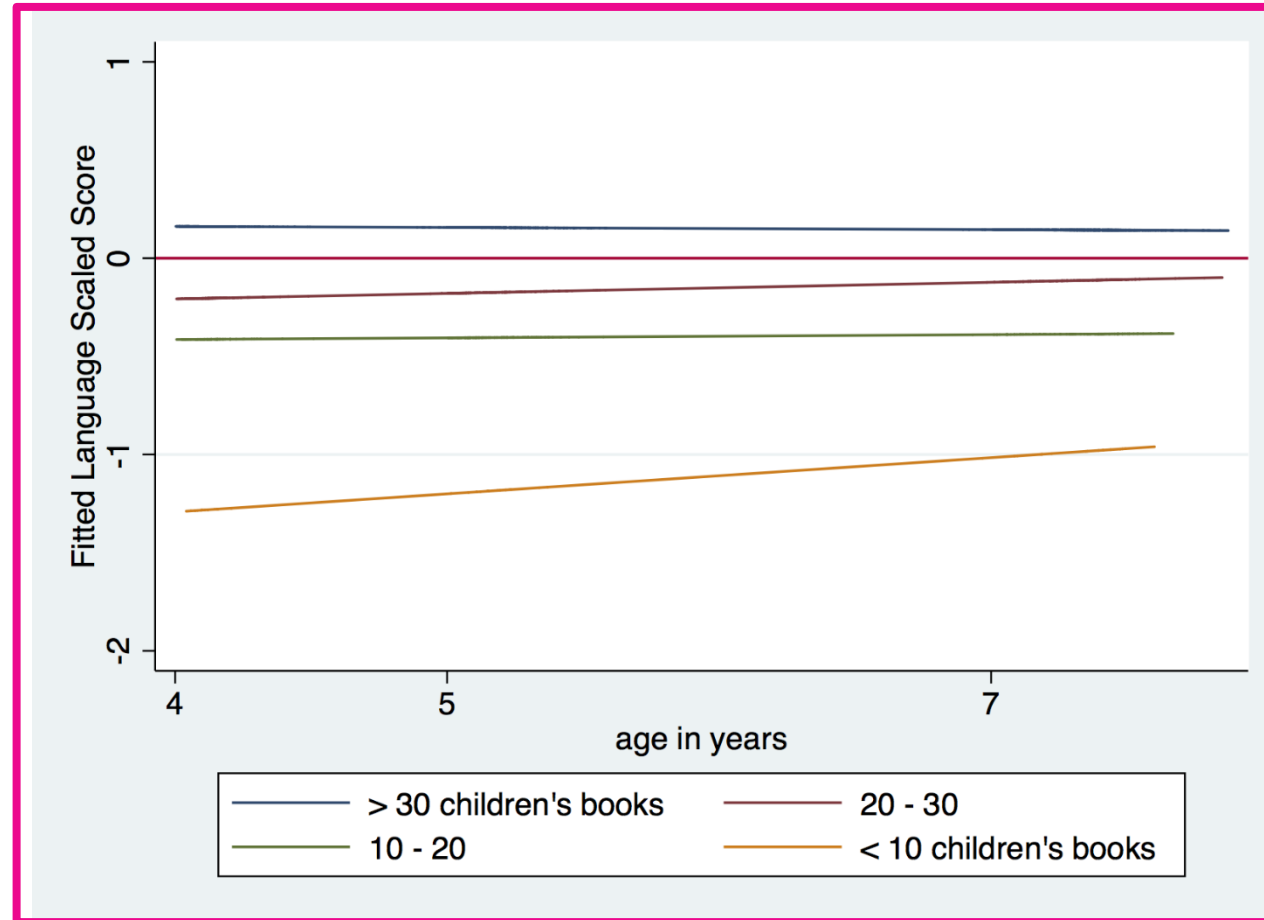
....slope between 4 and 7 years

- Low birth weight -ve
- Non English speaking background +ve



- Frequency being read to +ve
- [No. children's books in home +ve]
- [TV viewing (>3hrs day) -ve]
- Low prosocial score

# Number children's books in the home at 2 years



- Why Child Language Trajectories?
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# Public Health – preventative intervention

Primary Prevention

Secondary Prevention

Tertiary Prevention

Who, what & when?

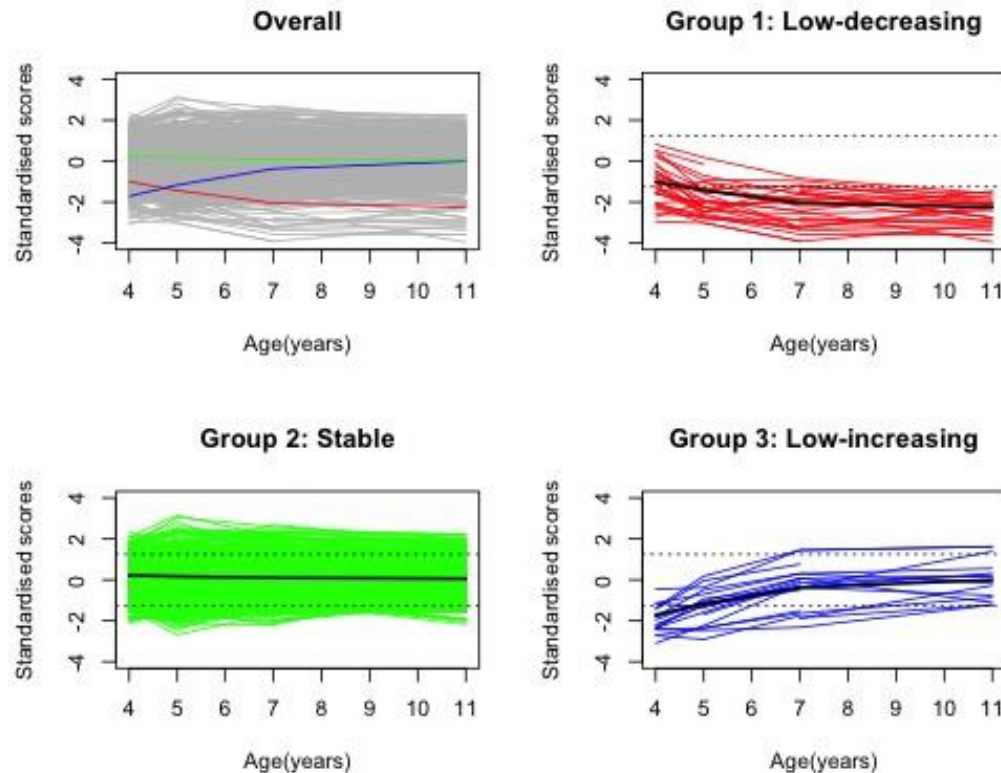
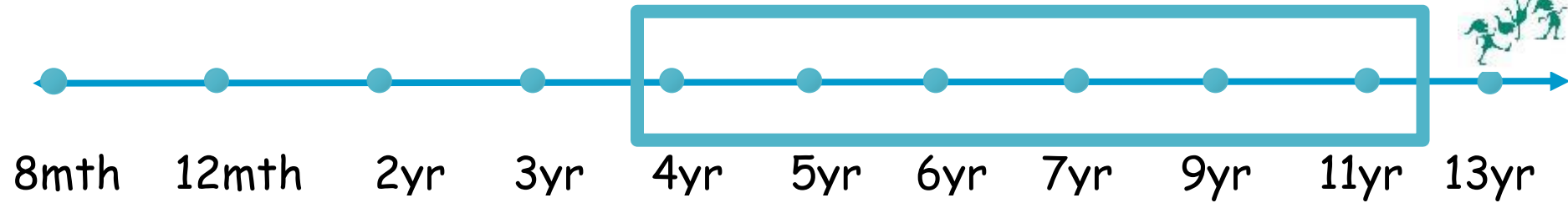
Targeted -  
Selective

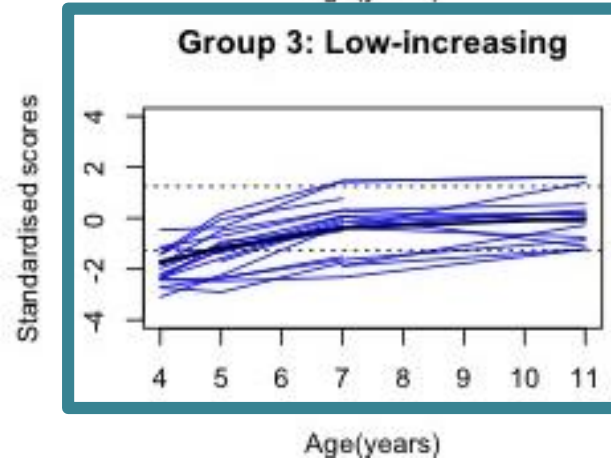
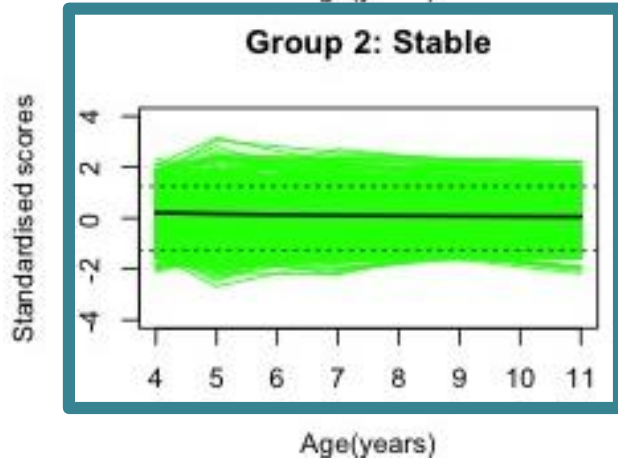
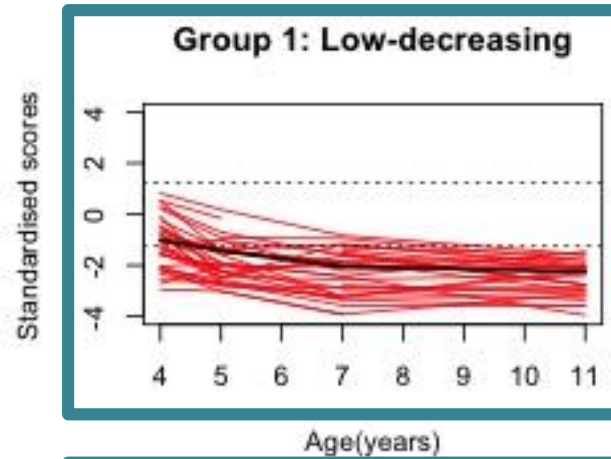
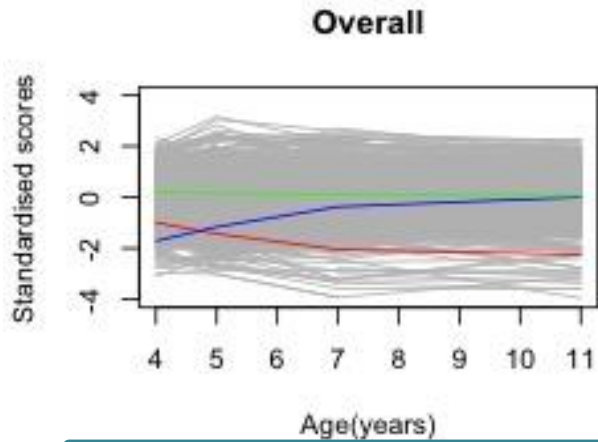
Targeted -  
Indicated

Persisting Condition

- Reduce negative sequelae
- Improve quality of life
- Reduce experience of disability

# Language trajectory subgroups





3 groups with significant overlap at 4 years

4% of children in low-decreasing group with average drop of 1.51SD from 4 – 11 years  
 ~50% had either a learning disability, ASD or ADHD diagnosis (not necessarily diagnosed at 4 yrs)\*

2% of children in low-increasing group with average increase of 1.96SD from 4 – 11 years –  
 ~50% were from a NESB. Younger mum and few books in the home are risks.

94% of children relatively stable trajectory with wide range in starting scores at 4 years. Movement does still occur with 22% > .75 SD

- Late emerging sub-group found by Snowling et al 2016 – Family History of Literacy Difficulties

# ‘Negative consequences’ can emerge early

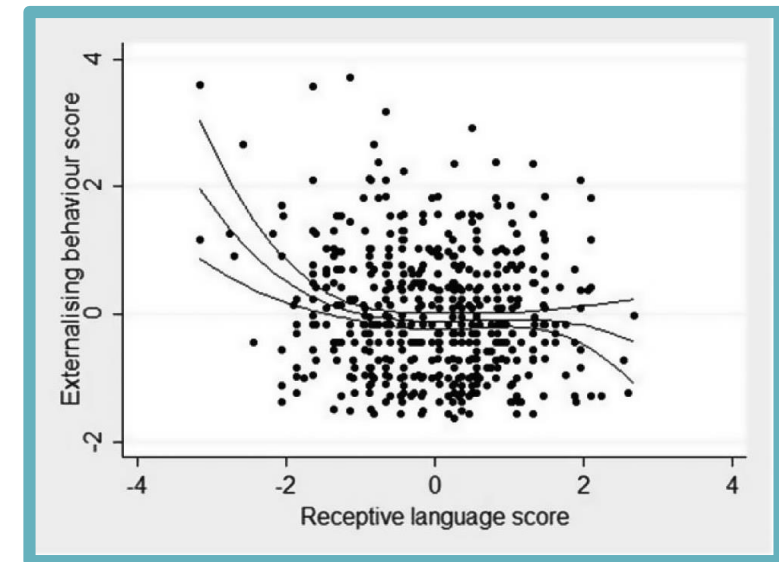
## By 7yrs

Difficulties or Limitations	Low Language	Typical Language
Literacy	37 - 48%	9 - 10%
Socio-Emotional-Behavioural	12 - 20%	2 - 8 %
Quality of Life	16 - 36%	10 - 13%

## By 4yrs

Difficulties or Limitations	Low Language	Typical Language
Socio-Emotional-Behavioural	18 - 20%	7-8%

## By 2-4 yrs



McKean, C., Reilly, S., Bavin, E. L., Bretherton, L., Cini, E. Conway, L., Cook, F., Eadie, T., Prior, M. Wake, M. Mensah, F. (2017) Language Outcomes at 7 Years: Early Predictors and Co-Occurring Difficulties. *Pediatrics* e20161684; DOI: 10.1542/peds.2016-1684

Bretherton, L., Prior, M., Bavin, E., Cini, E., Eadie, P., & Reilly, S. (2014). Developing relationships between language and behaviour in preschool children from the Early Language in Victoria Study: implications for intervention. *Emotional and Behavioural Difficulties*, 19(1), 7-27

Conway, L. J., Levickis, P. A., Mensah, F., McKean, C., Smith, K. and Reilly, S. (2017), Associations between expressive and receptive language and internalizing and externalizing behaviours in a community-based prospective study of slow-to-talk toddlers. *International Journal of Language & Communication Disorders*, 52: 839–853. doi:10.1111/1460-6984.12320

# But they can also emerge later.....



International Journal of Language & Communication Disorders  
INT J LANG COMMUN DISORD, JULY–AUGUST 2018,  
VOL. 53, NO. 4, 799–810

**Research Report**  
Quality of life in children with developmental language disorder  
Patricia Eadie†<sup>ID</sup>, Laura Conway‡<sup>ID</sup>, Birgit Hallenstein§, Fiona Mensah‡, Cristina McKean¶ and Sheena Reilly||

**Poorer parent reported QoL evident at 4 years with a downward trajectory through to 9 years.**

How children cope socially, and their perceptions of their language skills make a difference to their well-being resilience, and friendships.

The Journal of Child Psychology and Psychiatry  
ACAMH The Association for Child and Adolescent Mental Health

Original Article  
**Health-related quality of life of children with low language from early childhood to adolescence: results from an Australian longitudinal population-based study**  
Ha N.D. Le✉, Fiona Mensah, Patricia Eadie, Cristina McKean, Emma Sciberras, Edith L. Bavin  
... See all authors

**50% of children with low language follow declining trajectories in Quality of life between 4 and 11 years**

Age	Stable high	Reduced-slow decline	Low-rapid decline
4	88	85	78
5	88	84	75
10	88	83	65
15	88	82	60

- Why Child Language Trajectories?
- What have we learned and how does it inform....
  - Secondary Prevention
  - Tertiary Prevention
- Conclusions

- We can confidently identify children likely to have persisting language difficulties by 4yrs so we should act!
- There is a small but very vulnerable 'late-emerging' group which we must not miss
- 'Negative consequences' of language difficulties can emerge early but also may emerge later
- We must monitor potentially vulnerable children throughout school
- In particular their language, quality of life and socio-emotional and mental health



- Targeting those who would benefit from intervention remains challenging
- This does not mean we should ‘watch and wait’ for people to present to services
- Consideration of environmental factors in addition to children’s language increases our ability to target intervention appropriately
- Integrated and cumulative risk models show promise in identifying children & families who would most benefit from interventions - but need more work to be used in practice





- Parental responsiveness is important in identifying children at risk and should be harnessed in interventions to promote change



There are a number of early factors we can harness for preventative interventions in the home learning environment

- Structural inequalities must be acknowledged when designing interventions and evaluating effectiveness
- Must challenge policy which places all the responsibility on individual families without tackling structural inequalities

# Thank you

The authors thank the Early Language in Victoria Study team and all participating families

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