

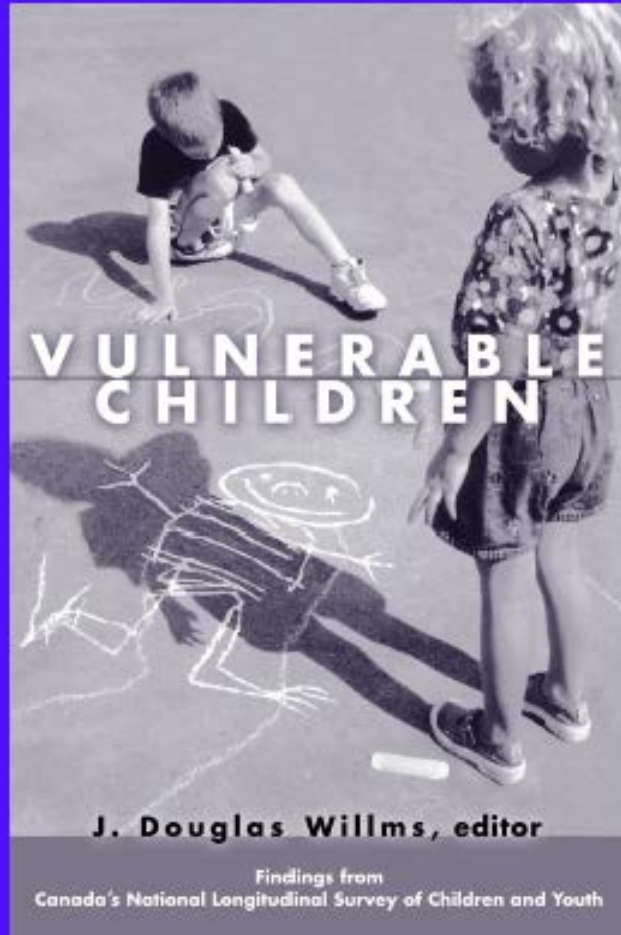
# Educational Prosperity in Alberta's Schools

J. Douglas Willms  
University of New Brunswick  
and  
The Learning Bar





The University of  
Alberta Press

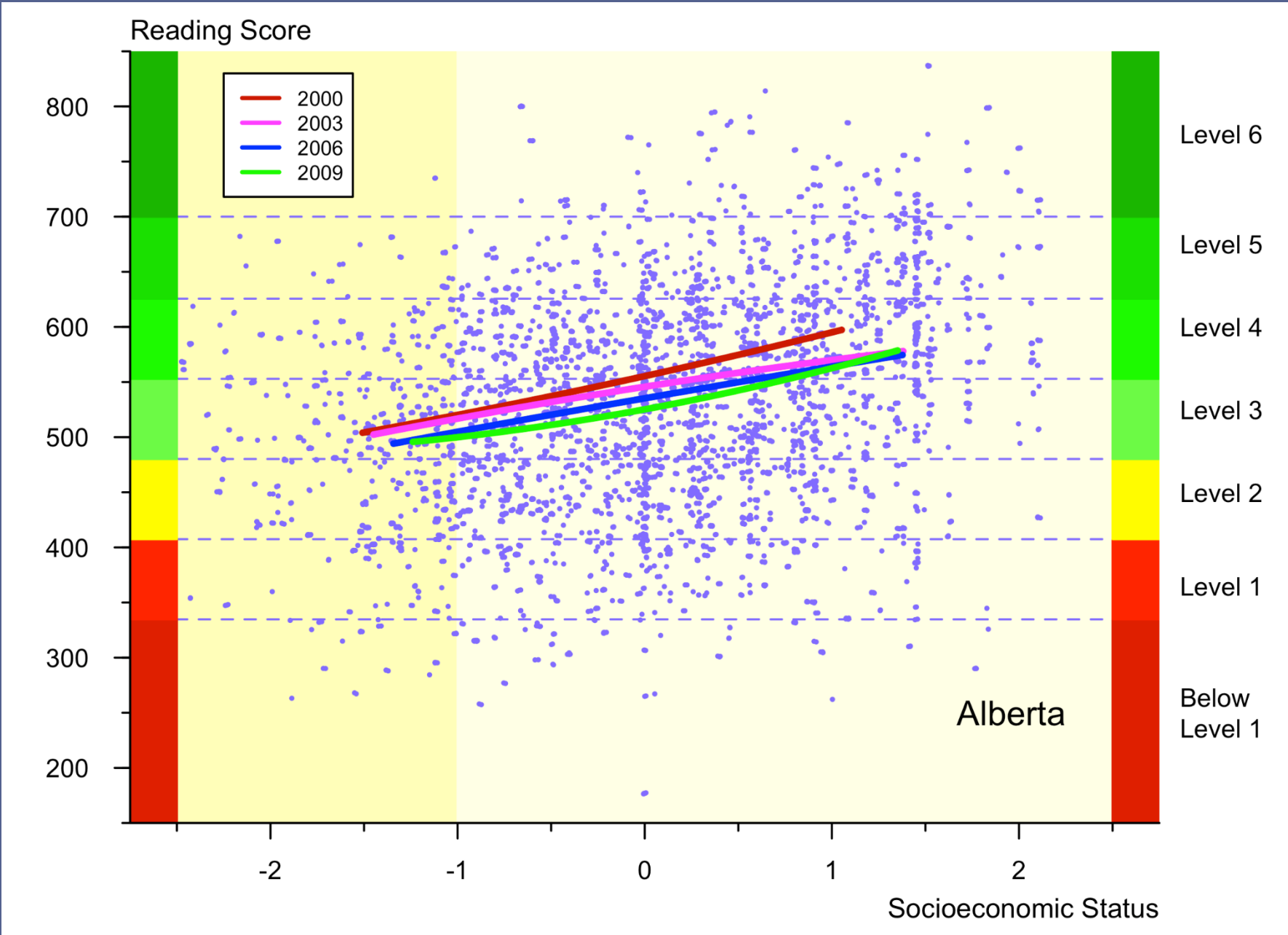


**28%**  
**of Canadian  
children are  
vulnerable**

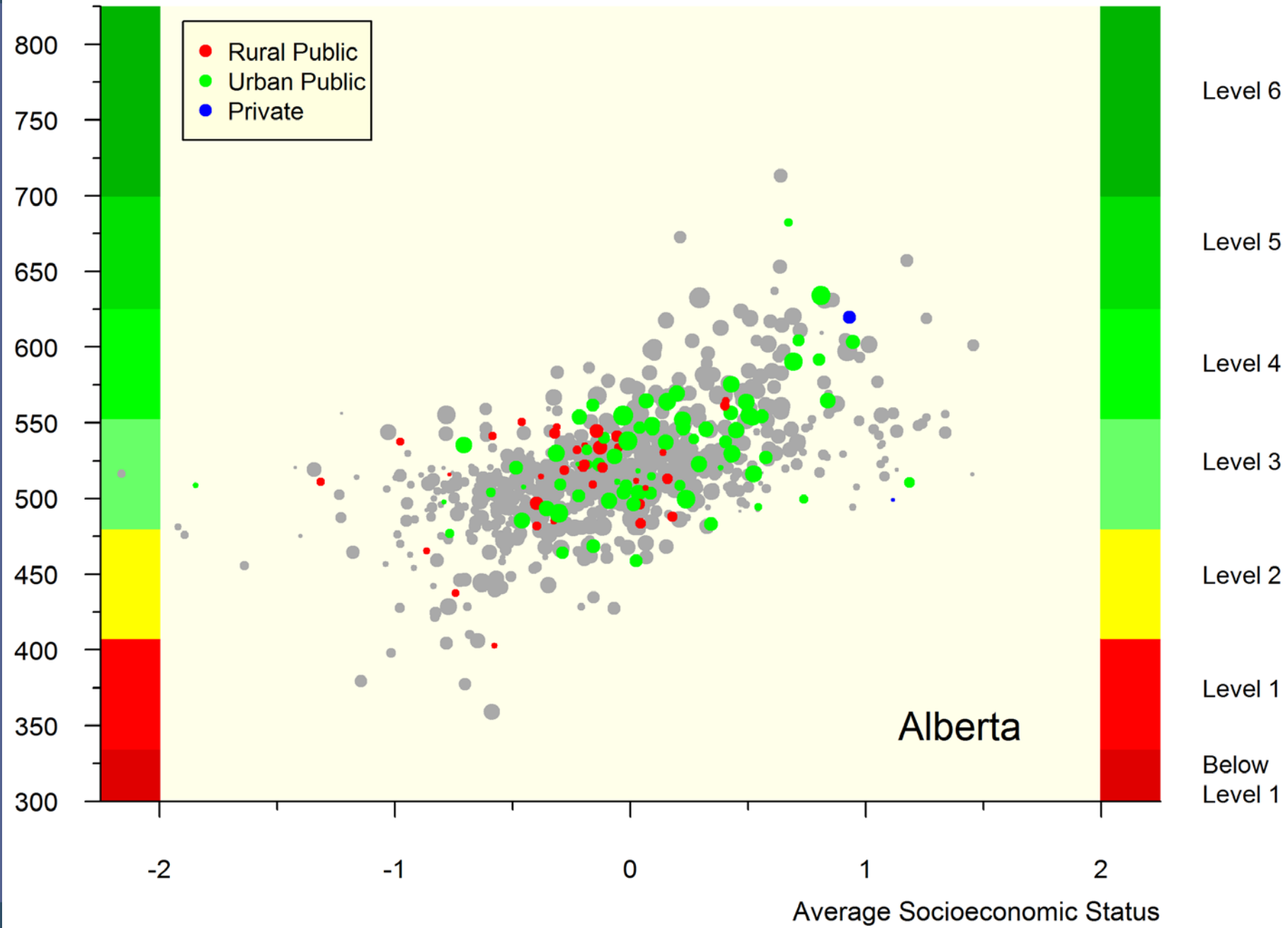
# Childhood Vulnerability

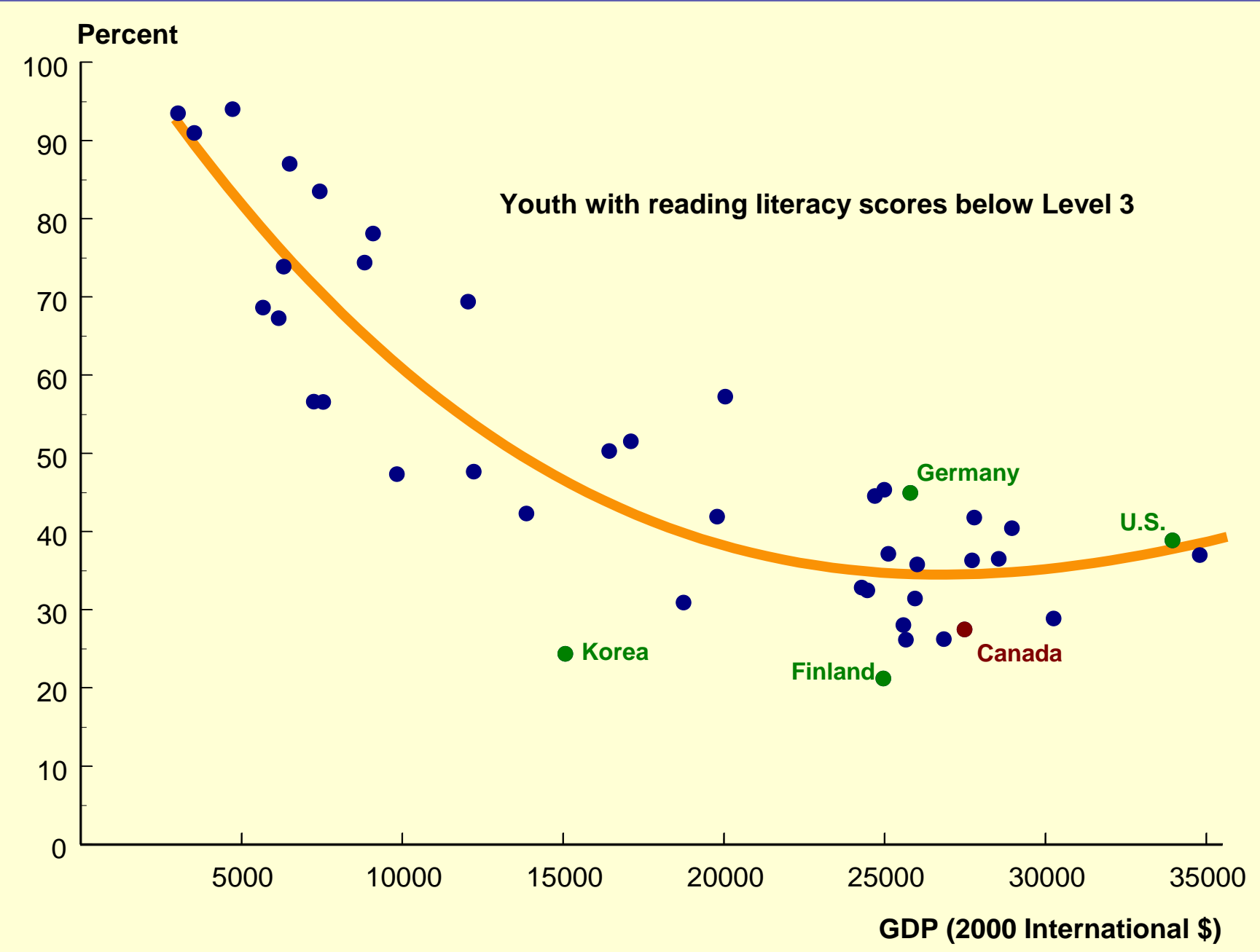
**Can we reduce the  
prevalence of  
vulnerability  
below 20%?**





# Average Reading Proficiency





# Educational Prosperity:

A Life-Course  
Approach





**Prior Success**  
Conception to Age 15



**Academic achievement**



**“School Effects”**  
Pre-Service training  
Professional development  
Computers for students  
Teachers’ salaries  
Parental choice  
Classroom disciplinary climate  
Quality instruction  
Learning time  
Material resources  
Etc.

**Age 15**

**Current assessment frameworks** presume that academic achievement, as measured by state test scores, for example, are the direct result of ‘school effects’ (green arrow).

However, achievement at age 15 is the result of several factors along the life path, from conception to age 15 (yellow arrow)

**Educational Prosperity** identifies four ways that success accumulates.



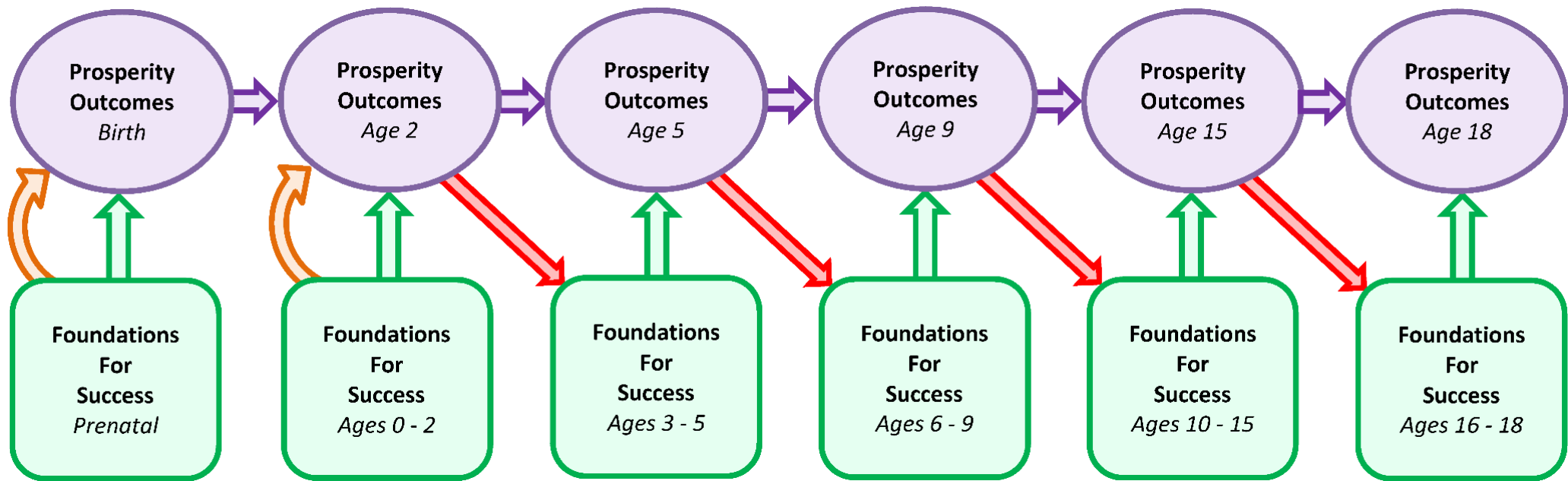
- **Educational Prosperity includes a core set of metrics for success at six key stages of development across the life-course from conception to adolescence.**
- **These metrics include a set of key outcomes for each developmental stage, called ‘prosperity outcomes,’ and a set of family, institutional, and community factors, called ‘foundations for success,’ which drive the prosperity outcomes.**
- **The approach considers four ways that success accumulates over the life-span.**

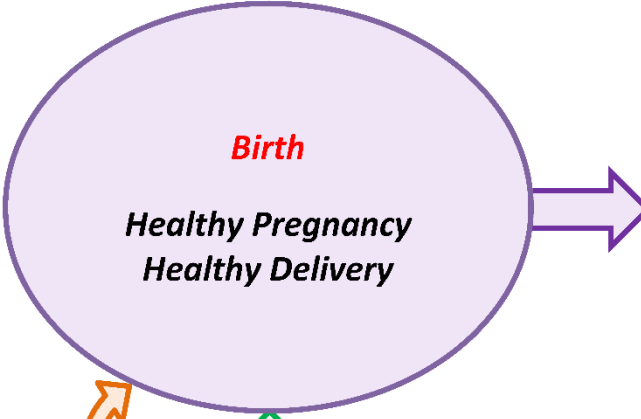
<b>Prosperity Outcomes</b>	Healthy pregnancy Healthy delivery	Language development Cognitive development Physical development	Awareness of self and environment Language development Cognitive development Physical development Social skills and approaches to learning	Reading literacy Numeracy Health and well-being Engagement	Academic achievement Educational attainment Health and well-being Engagement	Ethical citizen Leadership skills Health and well-being Communication and interaction skills
<b>Family</b>	Nutrition No exposure to toxins Mother's physical health Mother's emotional health	Breast-feeding and nutrition Mother's physical health Mother's emotional health Parenting skills Intra-family relations	Parenting skills Intra-family relations Family involvement	Parenting skills Intra-family relations Family involvement	Parenting skills Intra-family relations Family involvement	Parenting skills Intra-family relations Family involvement
<b>Institution</b>	<b>Health-care facility:</b> Prenatal care Primary health care	<b>Health-care facility:</b> Post-natal care Primary health care	<b>Pre-Schools:</b> Child-centered Goal-oriented Opportunities to socialize	<b>Schools:</b> Inclusive context Explicit teaching in: code-related skills and language skills Learning time Material resources	<b>Schools:</b> Inclusive context Quality instruction Learning time Material resources	<b>Schools:</b> Inclusive context Quality instruction Opportunities to learn career and life skills
<b>Community</b>	Social capital Resources	Social capital Resources	Social capital Resources	Social capital Resources	Social capital Resources	Social capital Resources
	<b>Pre-Natal</b>	<b>Early Development (Ages 0 – 2)</b>	<b>Pre-Primary (Ages 3 – 5)</b>	<b>Early Primary (Ages 6 – 9)</b>	<b>Late Primary and Lower Secondary (Ages 10 – 15)</b>	<b>Upper Secondary (Ages 16 – 18)</b>

# SUCCESS accumulates in four ways



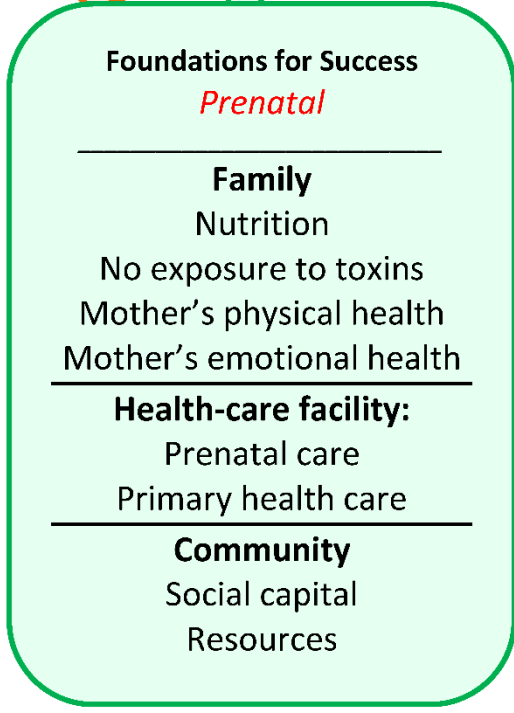
1. Biological embedding
2. Foundations for success
3. Cumulative effects
4. Selection





**Birth**

**Healthy Pregnancy**  
**Healthy Delivery**



**Foundations for Success**

**Prenatal**

**Family**

Nutrition

No exposure to toxins

Mother's physical health

Mother's emotional health

**Health-care facility:**

Prenatal care

Primary health care

**Community**

Social capital

Resources

# 1. Biological Embedding

*Differential social experiences* get *under the skin* in early life and, through their effects on developing neurobiological pathways, affect later trajectories in human health, learning, and behaviour.



## Differential social experiences

Socioeconomic gradients are evident in most social outcomes. They are also evident in children's early experiences; for example,

- Breast-feeding
- Smoking during pregnancy

## under the skin

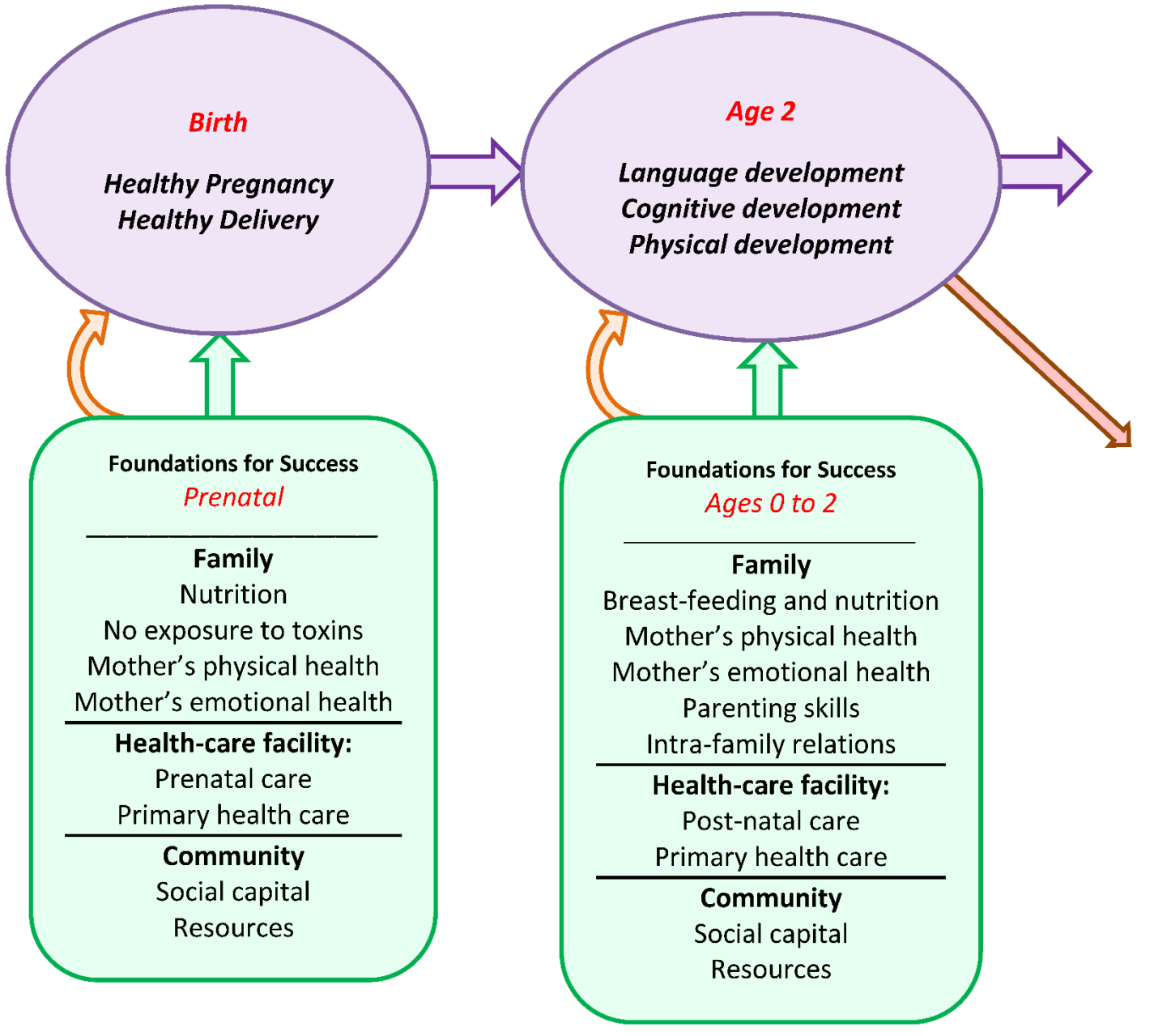
A key development in the field of human development is the work defining neurobiological development and its effects on health, learning, and behaviour.

- Brain development from conception to age one is rapid and extensive, much more so than previously believed, and is heavily influenced by the infant's environment (Carnegie Corporation of New York, 1994).

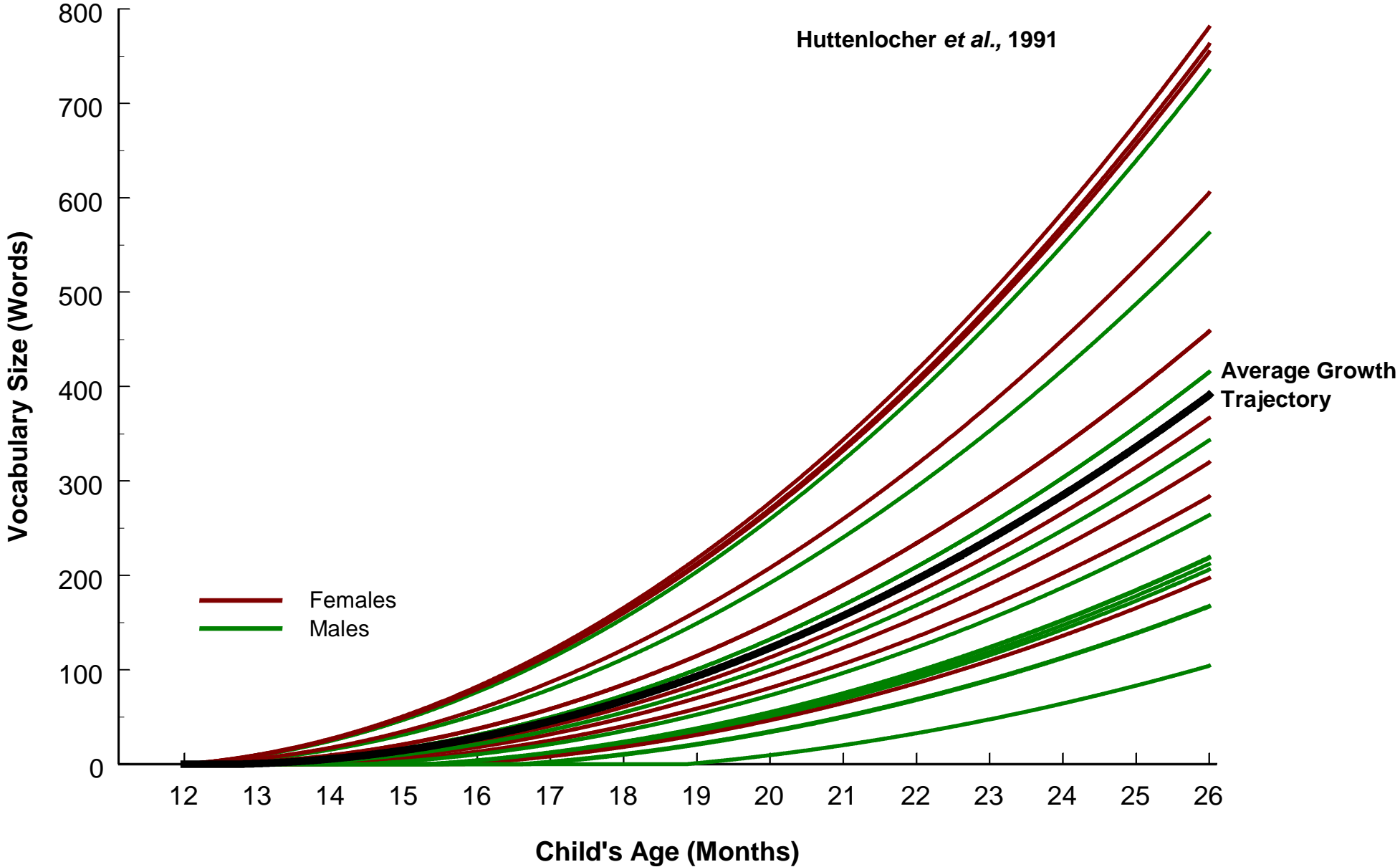


- A newborn has billions of neurons, which, during the course of development, form connections called synapses. These synapses are formed in response to environmental stimuli, and while this is occurring, many of the neurons that are not being used are pruned away.
- This process of synapse formation and neuron pruning is often referred to as the “wiring” or “sculpting” of the brain. Moreover, there are critical periods, especially during the first three years, when particular areas of the brain are sculpted
- Longitudinal studies that have followed children who have received intensive interventions aimed at increasing stimulation and providing parent training and support have demonstrated long-lasting effects on their social, behavioural, and educational outcomes

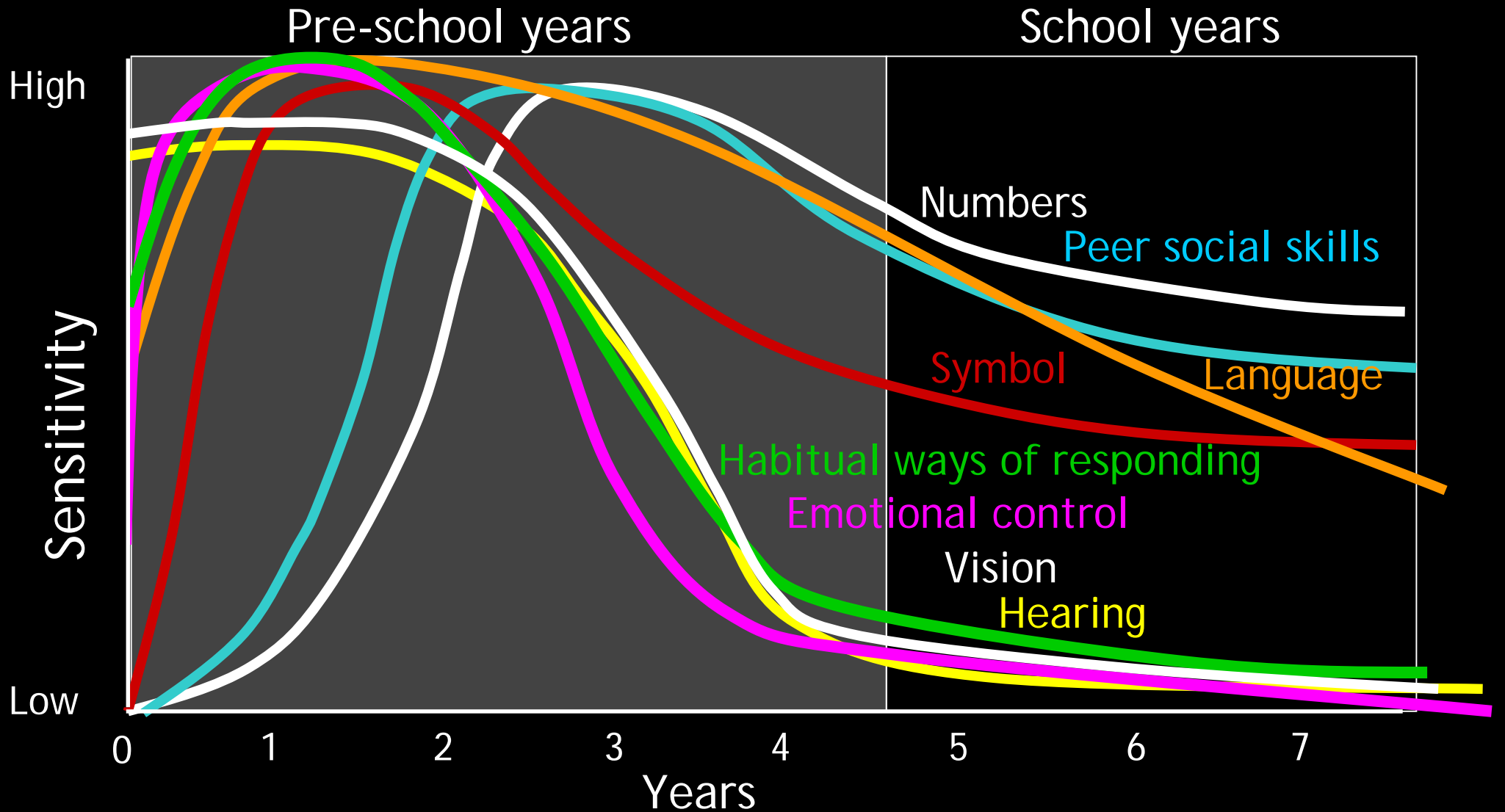




Huttenlocher *et al.*, 1991



# Sensitive Periods in Early Brain Development



# 2. Cumulative Development



Children develop their skills in a cumulative process as they make the transition from one stage to the next. The skills they attain at one stage are an asset that they can use to develop skills at the next stage.

For example, children's acquisition of language skills at age 2 is a strong predictor of their pre-literacy skills at age 5.





# The Early Years Evaluation: An early warning system

[www.earlyyearesevaluation.com](http://www.earlyyearesevaluation.com)

# The **EYE** assesses skills in five developmental areas:



- **Awareness of Self and Environment** - a child's understanding of the world and his or her ability to make connections with home and community experiences.



- **Social Skills and Approaches to Learning (EYE-TA only)** - a child's attentiveness during classroom activities and his or her ability to interact with peers while respecting the classroom rules.



- **Cognitive Skills** - a child's basic math and pre-reading skills and his or her ability to solve problems.



- **Language and Communication** - a child's understanding of spoken language and his or her ability to express thoughts and feelings.



- **Physical Development**

**Fine motor** - a child's ability to perform small movements that require hand-eye coordination.

**Gross motor** - a child's ability to perform large movements that involve arms, legs, and body.



The **EYE** is most often used as part of a transition-to-school program.



The EYE consists of two complementary components:  
the ***EYE-Direct Assessment (EYE-DA)***; and,  
the ***EYE-Teacher Assessment (EYE-TA)***.

# EYE-TA Individual Child Report












School Name, Teacher Name (Classroom Name)

Your child's classroom teacher has recently completed the Early Years Evaluation-Teacher Assessment (EYE-TA). The EYE-TA enables teachers to determine each child's progress and provide meaningful instruction to meet their needs. The EYE-TA assesses five areas of early learning closely associated with children's success at school.

The results for your child are presented below.





Name: Child Name

Date of Birth: Jan 1, 2010

Description of the developmental areas:	Child's results
 <p><b>Awareness of Self and Environment</b> - a child's understanding of the world and his or her ability to make connections with home and community experiences. - for example, a child's ability to:</p> <ul style="list-style-type: none"> <li>• identify commonly used signs such as stop and exit</li> <li>• understand positional concepts such as front and back</li> <li>• recognize body parts such as their chin and shoulder</li> </ul>	
 <p><b>Social Skills and Approaches to Learning</b> - a child's attentiveness during classroom activities and his or her ability to interact with peers while respecting the classroom rules. - for example, a child's ability to:</p> <ul style="list-style-type: none"> <li>• finish one activity before starting another</li> <li>• take turns in small groups</li> <li>• play well with others</li> </ul>	
 <p><b>Cognitive Skills</b> - a child's basic math and pre-reading skills and his or her ability to solve problems. - for example, a child's ability to:</p> <ul style="list-style-type: none"> <li>• name letters and sounds</li> <li>• count numbers and form sets of objects</li> </ul>	
 <p><b>Language and Communication</b> - a child's understanding of spoken language and his or her ability to express thoughts and feelings. - for example, a child's ability to:</p> <ul style="list-style-type: none"> <li>• listen to and understand instructions, discussions and stories</li> <li>• use full sentences (5 to 7 words) that others can easily understand</li> <li>• verbalize how they are feeling</li> </ul>	
 <p><b>Physical Development</b></p> <p><b>Fine motor:</b> a child's ability to perform small movements that require hand-eye coordination. - for example, a child's ability to:</p> <ul style="list-style-type: none"> <li>• use crayons, pencils, and scissors</li> </ul> <p><b>Gross motor:</b> a child's ability to perform large movements that involve arms, legs, and body. - for example, a child's ability to:</p> <ul style="list-style-type: none"> <li>• balance, jump and skip</li> </ul>	<p>Fine Motor    Gross Motor</p> <div style="display: flex; justify-content: space-around;">   </div>

\*The language of this report may be different from the language that was used to assess your child.

**Explanation of Results**

-  This child can achieve the tasks in this developmental area.
-  This child is **experiencing some difficulty** in achieving the tasks in this developmental area.
-  This child is **experiencing significant difficulty** in achieving the tasks in this developmental area.
-  This child did **not complete** enough tasks in this developmental area to provide a result.

If you would like more information about this assessment, or suggestions for helping your child, we invite you to contact the classroom teacher.

For more information about the EYE, please visit [thelearningbar.com](http://thelearningbar.com).



## *EYE* for RTI

A prediction model  
based on  
longitudinal data



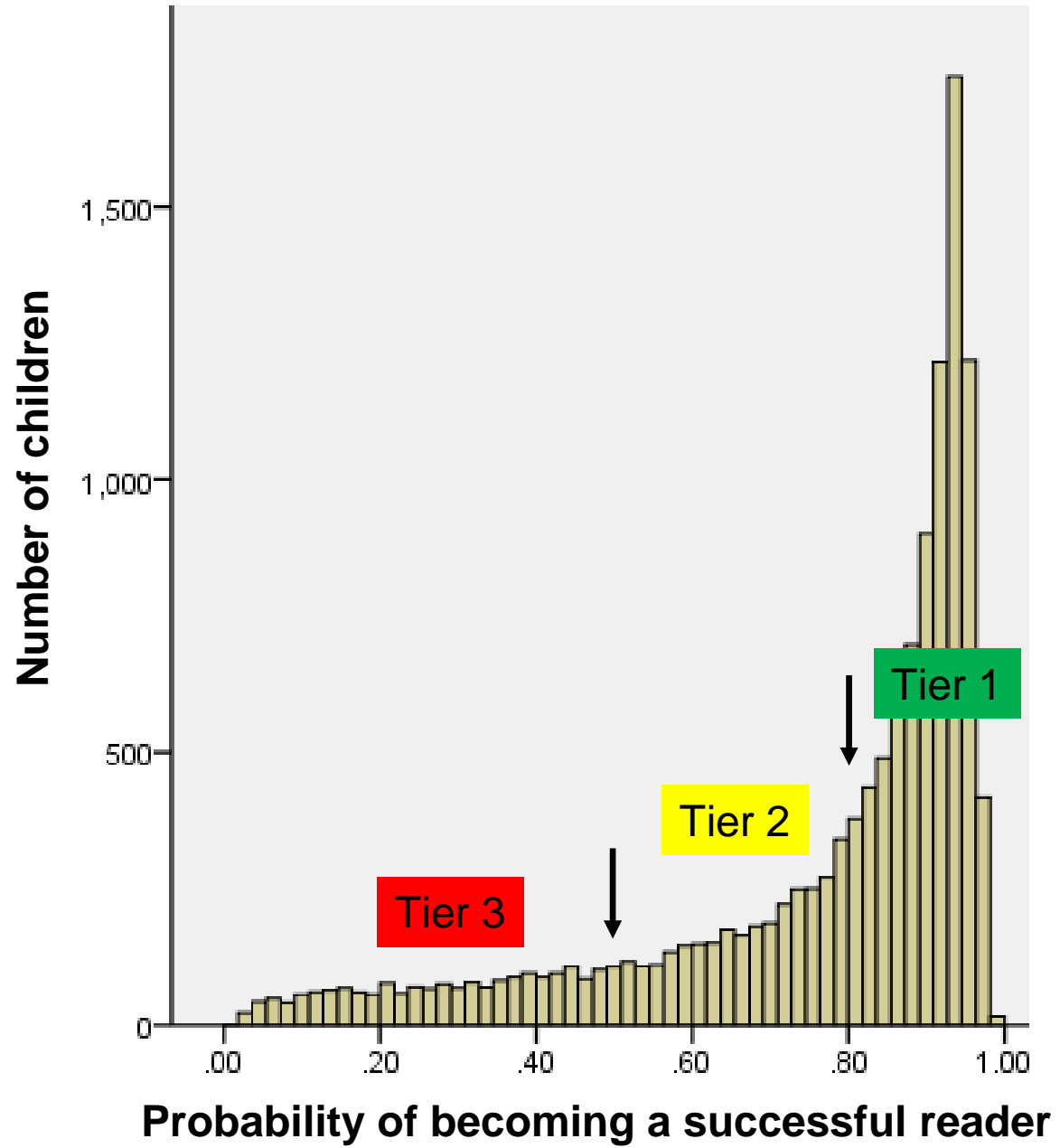
The prediction equation is based on a logistic regression model of the form

---

$$\Pr (Y = 1|X) = \frac{1}{1 + \exp(-Z)}$$

where  $Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_5 X_5$

$$Z = \beta_0 + 1.00 * \text{Cognitive Skills} + \\ 0.75 * \text{Language and Communication} + \\ 0.25 * \text{Fine Motor Skills} + \\ 0.20 * \text{Awareness of Self and Environment} + \\ 0.15 * \text{Social Skills and Approaches to Learning.}$$

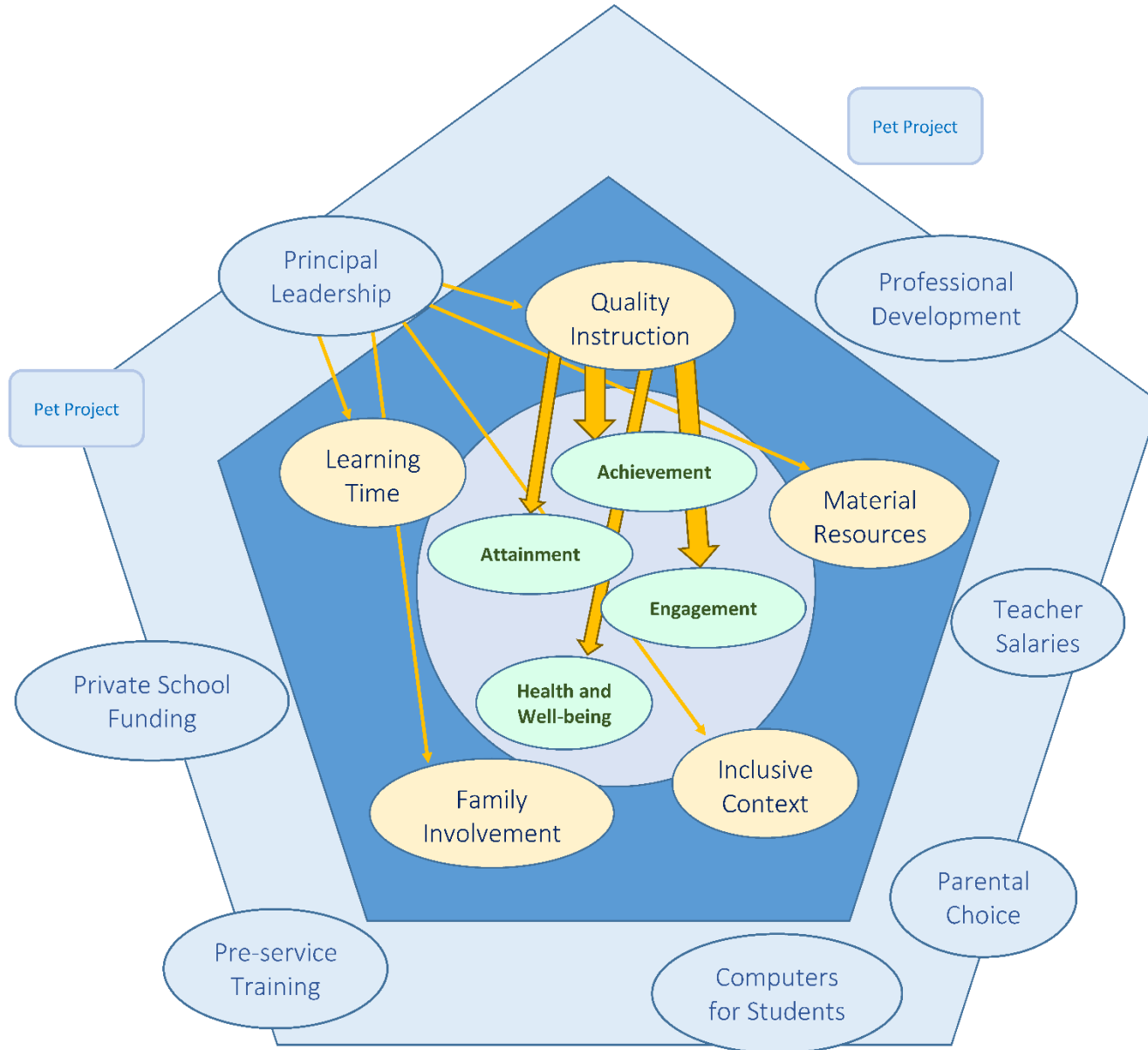




# 3. Foundations for Success

In addition to the effects that are biologically embedded, children's outcomes are directly affected by the foundations for success at each stage of development.





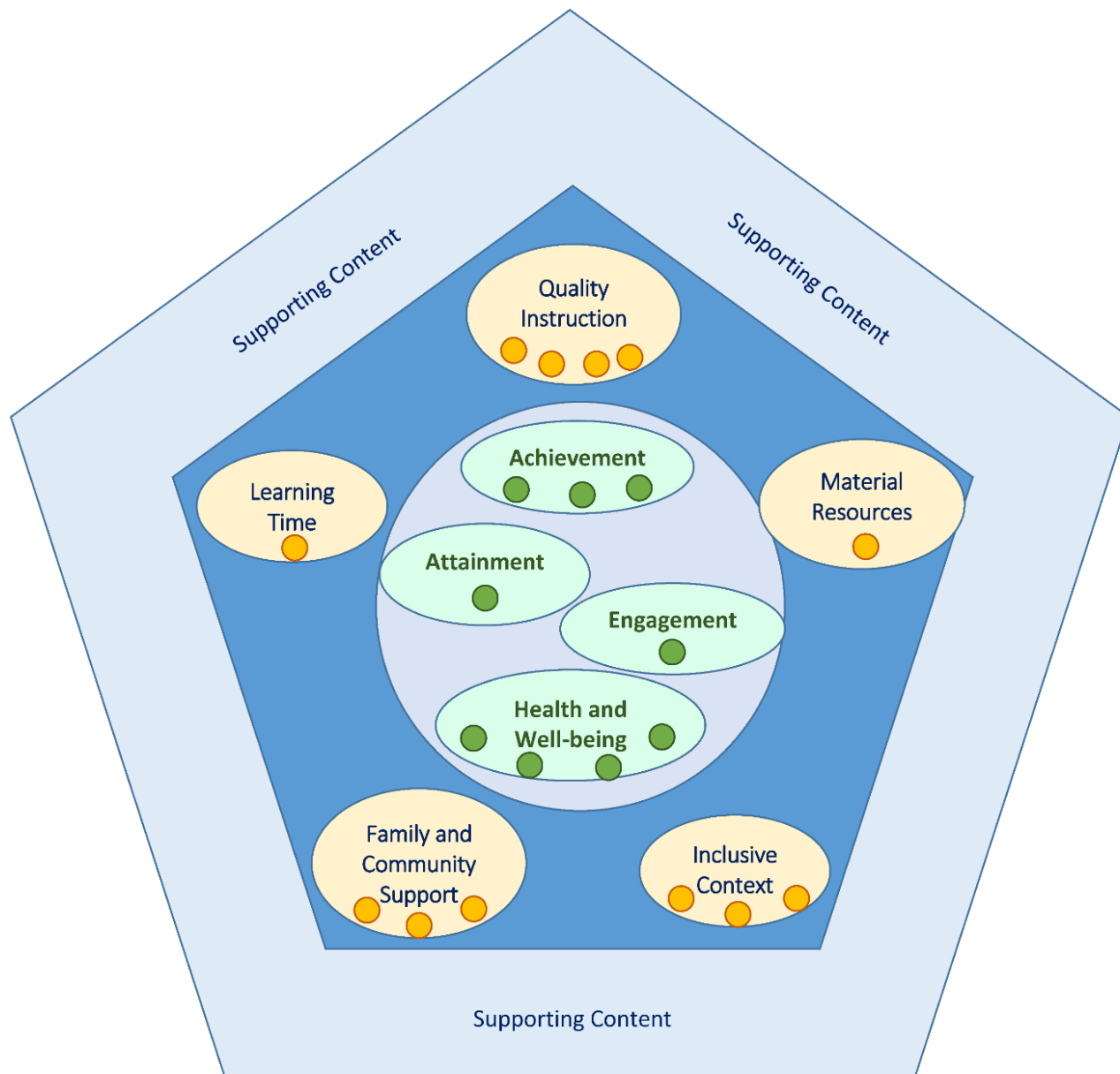
Foundations for Success factors are:

**Potent** (strong effects on outcomes)

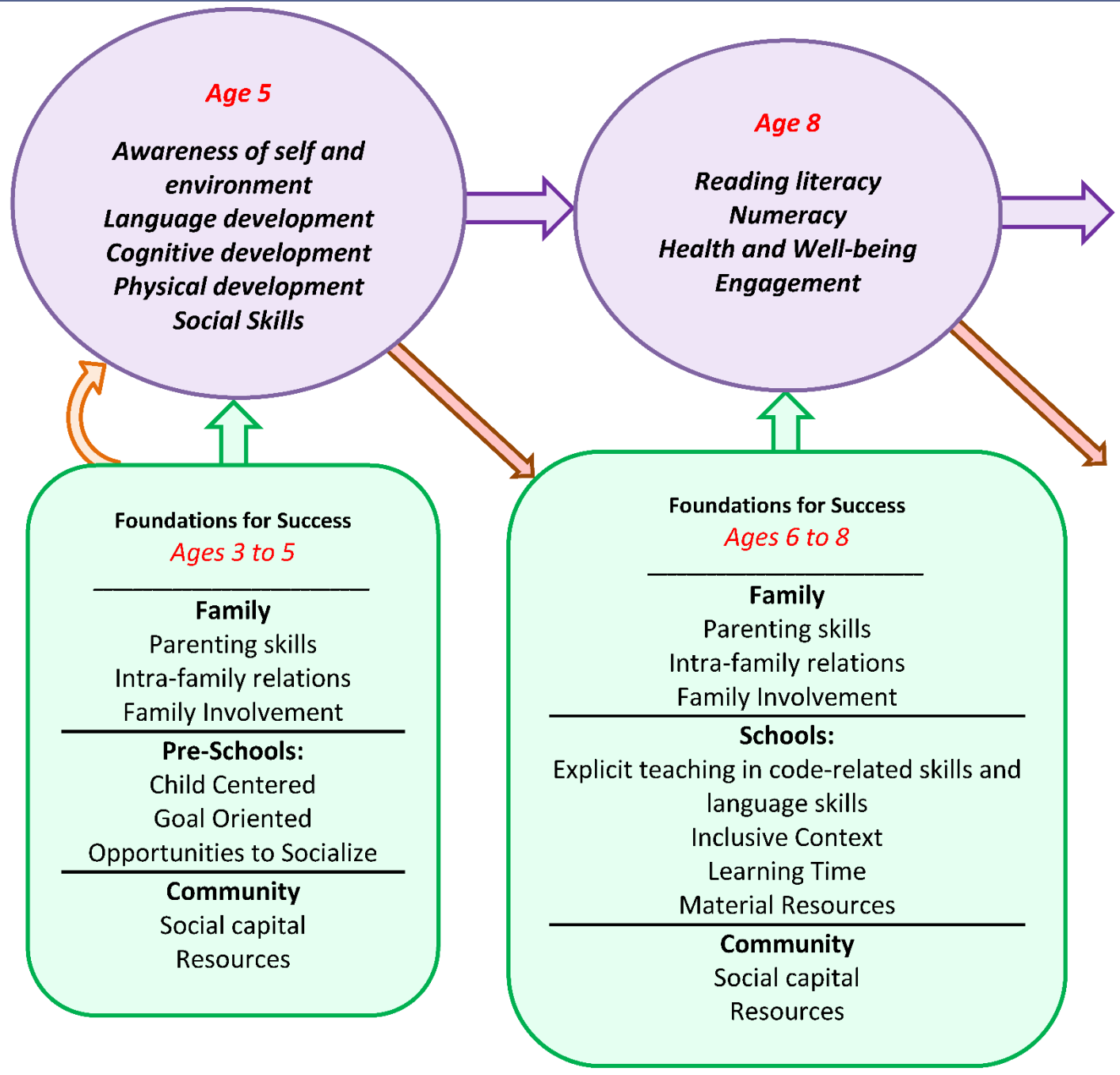
**Pervasive** (effect a range of outcomes)

**Proximal** (has a direct effect on the outcomes)





Educational Prosperity for PISA for Development:  
The “Minister’s Dashboard”



# Confident Learners

## A Whole-School Literacy Program for Indigenous On-Reserve Schools

Formerly part of Canadian Research Institute for Social Policy and now with The Learning Bar in partnership with 32 First Nations



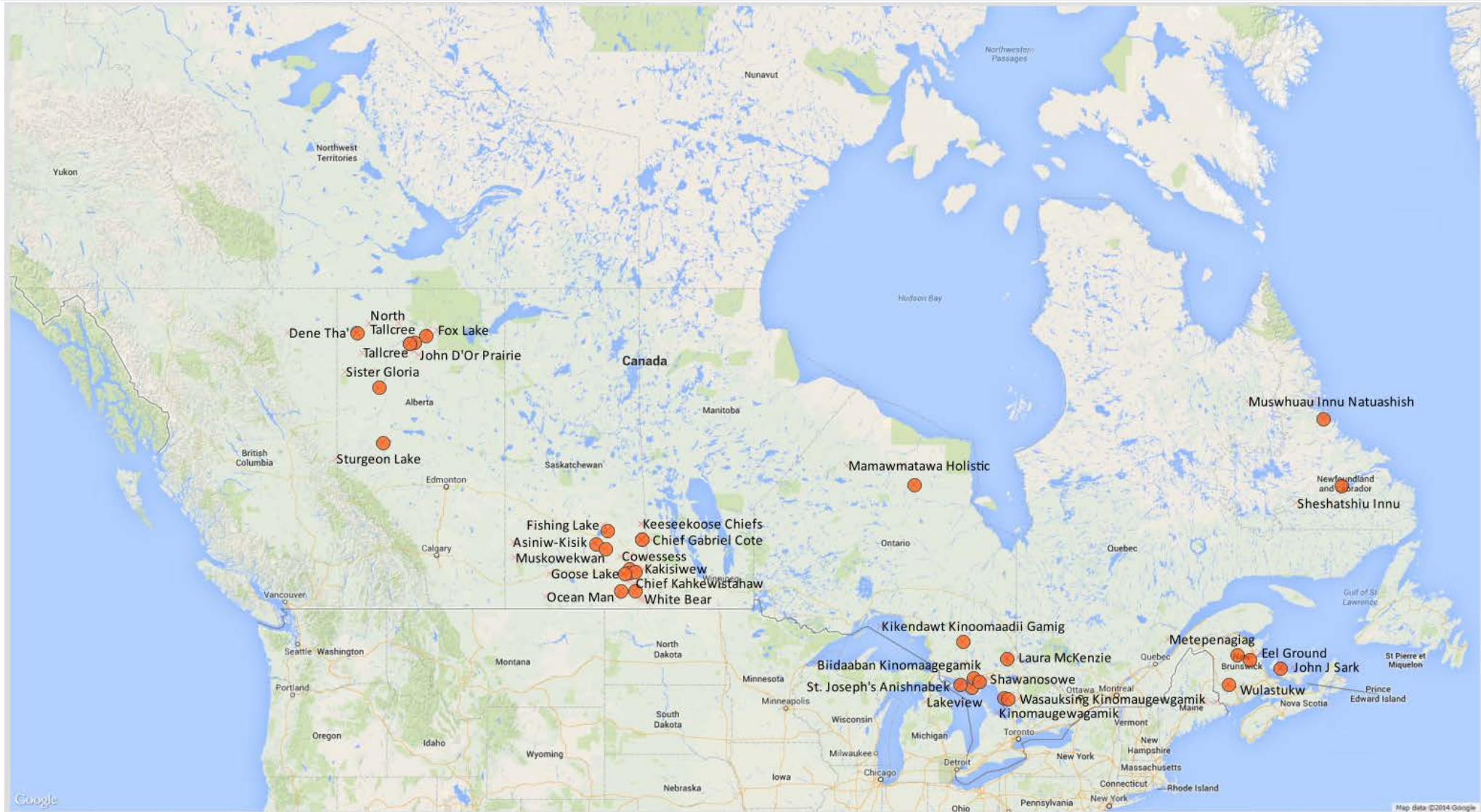
Funded by:  
Indigenous and  
Northern  
Affairs Canada

# Project Goal



Confident Learners is an initiative that brings to bear the **science of learning how to read**, a **rigorous curriculum** aligned with **teaching activities** and **assessments**, quality **professional development**, and the support of **communities and families** to ensure Indigenous children become fluent readers.

# 32 First Nations Partners





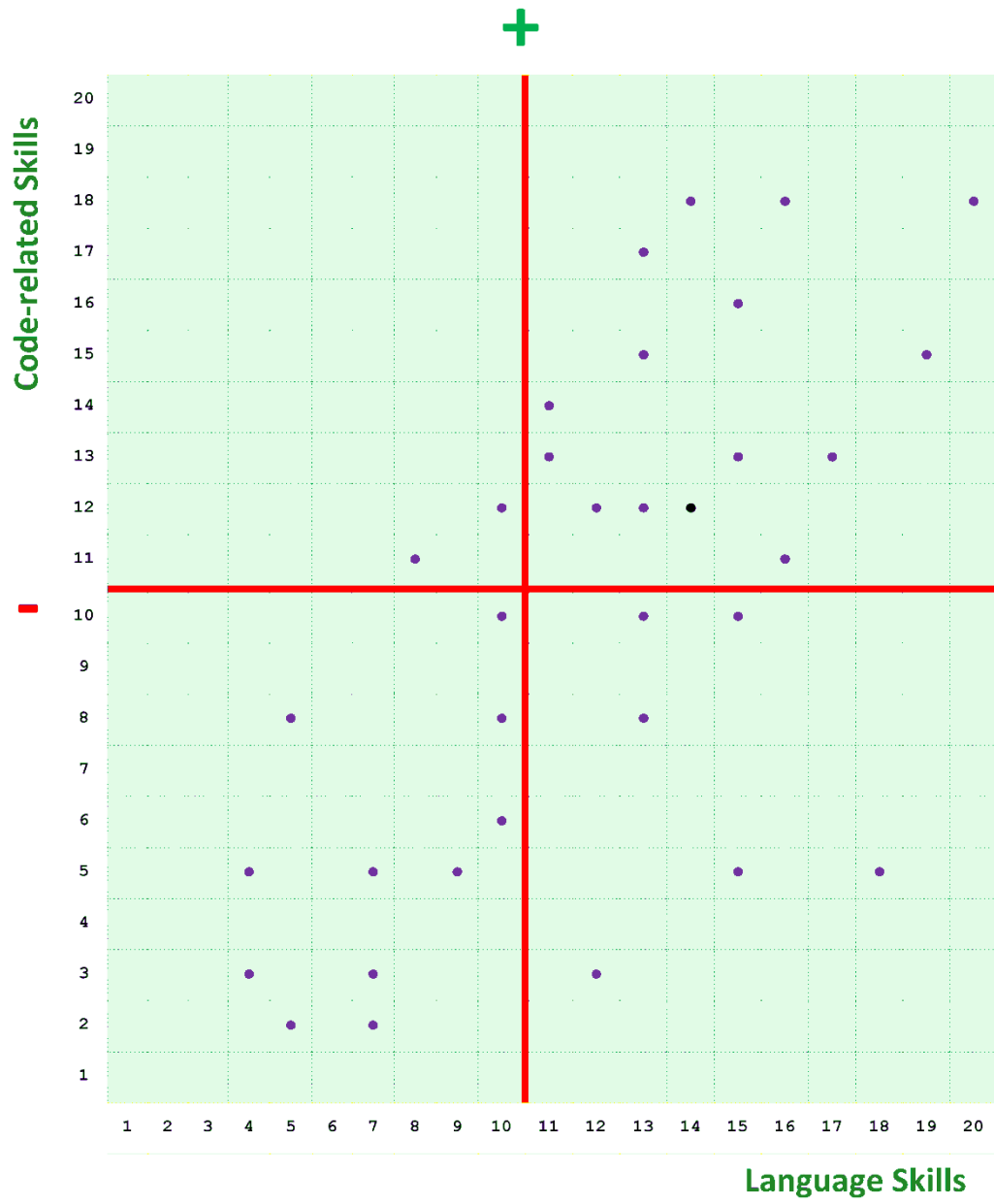
# The simple view of reading



**‘The simple view of reading’** (Rose, 2006) has two critical, complementary dimensions:

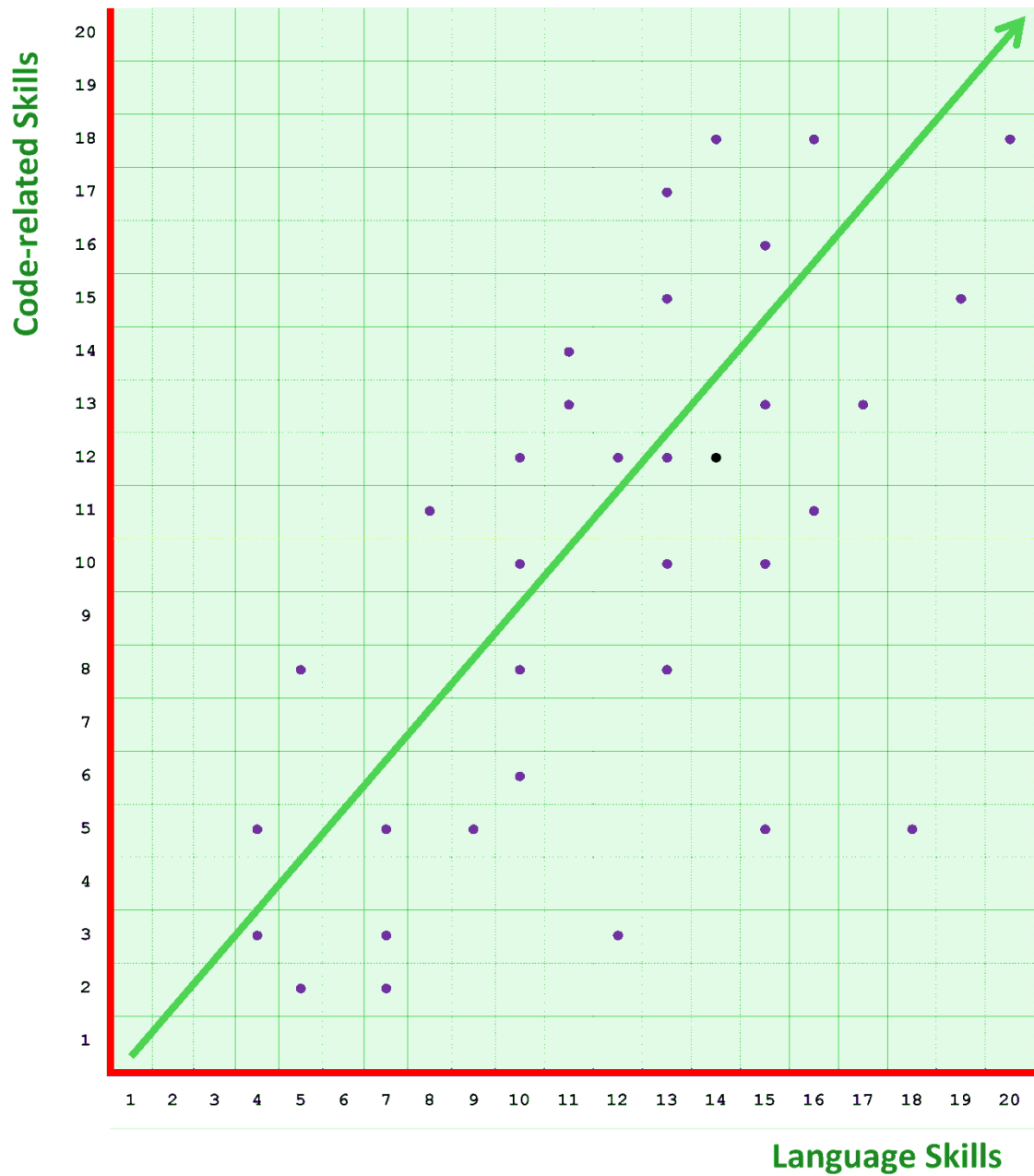
*Code-related skills* – the ability to ‘decode’ (sound out) and recognize particular words, and

*Language skills* – being able to understand and interpret spoken and written language.



A Deficit Approach





**A Pathway Approach**

# Code-Related Skills

Concepts  
About  
Print

Phonological  
Awareness

Letter  
Knowledge

Reading Fluency

Supra-  
Phonemic  
Awareness  
(Large Units)

Phonemic  
Awareness  
(Small units)

Accuracy:  
Word  
Decoding  
and Spelling

Accuracy:  
Word  
Recognition  
and Spelling

Speed  
and  
Prosody

# The Reading Mountain

31												19								
30												18								
29									7			17								
28							8		6			16								
27						6	7		5			40								
26						5	13	2	4			39								
25						5	12	1	3	11	15	38								
24						4	11	10	16	10	14	37								
23						3	10	9	15	9	13	36								
22						22	9	25	14	8	12	35								
21						21	8	24	13	22	30	34								
20						20	7	23	12	21	29	33								
19						19	6	22	11	20	28	32								
18						18	32	21	37	19	27	31								
17					4	17	31	20	36	18	26	74								
16				2	12	16	30	19	35	17	25	73								
15			3	7	11	15	29	18	34	49	24	72	24							
14			2	26	10	14	28	17	33	48	23	71	23	28						
13			1	25	9	13	27	16	32	47	61	70	22	27						
12			14	24	8	36	26	15	31	46	60	69	21	26	32					52
11			13	23	7	35	25	14	30	45	59	68	20	25	31					51
10			12	22	6	34	24	39	29	44	58	67	46	52	30	36		44	48	50
9			11	21	5	33	23	38	28	43	57	66	45	51	29	35	40	43	47	49
8			10	20	4	32	42	37	27	42	56	65	44	50	56	34	39	42	46	87
7	1	1	9	19	3	20	41	36	26	41	55	64	43	49	55	33	38	41	45	86
6	3	7	8	18	31	19	40	35	40	40	54	63	42	48	54	62	37	73	79	85
5	2	6	10	17	30	18	39	34	46	39	53	62	41	47	53	61	67	72	78	84
4	1	5	9	16	29	17	38	33	45	38	52	47	78	82	86	60	66	71	77	83
3	3	4	8	15	28	16	37	44	26	41	51	32	77	81	85	59	65	70	76	82
2	2	5	7	12	27	15	22	43	25	28	50	31	76	80	84	58	64	69	75	81
1	1	4	6	11	13	14	21	23	24	27	29	30	75	79	83	57	63	68	74	80
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Kindergarten					Grade 1					Grade 2					Grade 3				

<b>Code-Related Skills</b>	Concepts about print	22
	Phonological Awareness – Supra-Phonemic Awareness	25
	Phonological Awareness – Phonemic Awareness	19
	Letter Knowledge	23
	Fluency – Word Decoding and Spelling	86
	Fluency – Word Recognition and Spelling	78
	Fluency – Speed & Prosody	27

14	1	1	2	2	4	5	6	1	3	5	8	10	12	14	17	19	21	23	25	27
13	5	17	1	7	3	4	5	8	2	4	7	9	11	13	16	18	20	22	24	26
12	4	16	28	6	13	3	15	7	10	16	6	24	26	32	15	42	50	58	66	78
11	3	15	27	5	12	20	14	25	9	15	18	23	25	31	36	41	49	57	65	77
10	2	14	26	4	11	19	13	24	31	14	17	22	56	30	35	40	48	56	64	76
9	1	13	25	3	10	18	12	23	30	13	44	21	55	29	34	39	47	55	63	75
8	8	12	24	2	9	17	11	22	29	12	43	20	54	28	33	38	46	54	62	74
7	7	11	23	34	8	16	10	21	28	11	42	19	53	27	68	37	45	53	61	73
6	6	10	22	33	39	15	9	20	27	35	41	48	52	62	67	74	44	52	60	72
5	5	9	21	32	38	14	8	19	26	34	40	47	51	61	66	73	43	51	59	71
4	4	8	20	31	37	43	7	18	22	33	39	46	50	60	65	72	78	82	86	70
3	3	7	19	30	36	42	6	17	16	32	38	45	49	59	64	71	77	81	85	69
2	2	6	18	29	35	41	21	16	15	23	37	19	21	58	63	70	76	80	84	68
1	1	9	10	11	12	40	44	13	14	17	36	18	20	57	22	69	75	79	83	67
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>

<b>Code-Related Skills</b>	Concepts about print	22
	Phonological Awareness – Supra-Phonemic Awareness	25
	Phonological Awareness – Phonemic Awareness	19
	Letter Knowledge	23
	Fluency – Word Decoding and Spelling	86
	Fluency – Word Recognition and Spelling	78
	Fluency – Speed & Prosody	27

# Language Skills

Vocabulary

Receptive  
Language

Expressive  
Language

Written  
Language

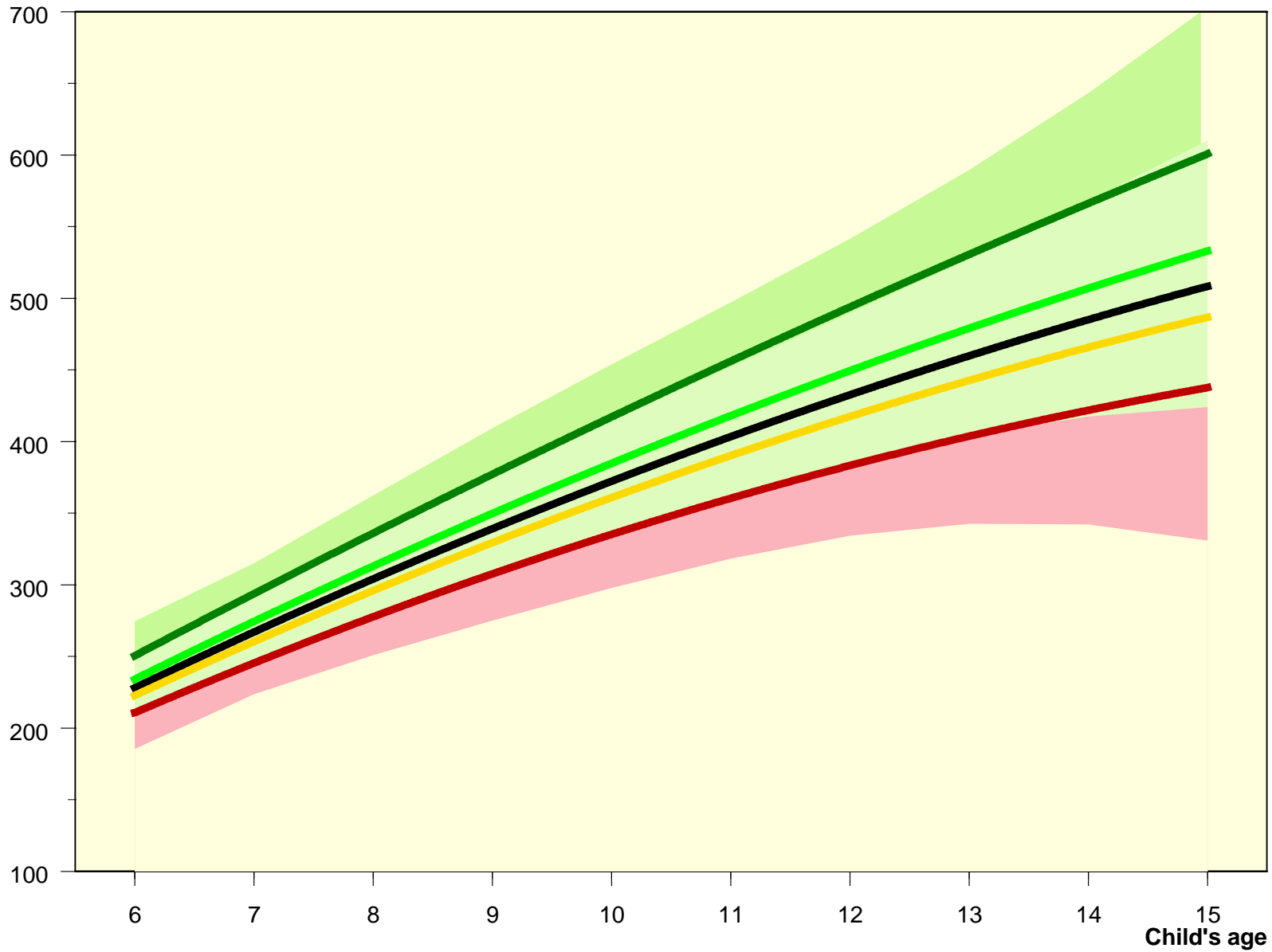
14	5	10	15	20	22	27	32	36	41	44	2	5	12	17	27	32	39	44	50	57
13	4	9	14	19	21	26	31	35	40	43	1	4	11	16	26	31	38	43	49	56
12	3	8	13	18	22	25	30	34	39	42	49	3	10	15	25	30	37	42	48	55
11	2	7	12	17	21	24	29	33	38	40	48	54	9	14	24	29	36	41	47	54
10	1	6	11	16	20	23	28	33	37	39	47	53	8	13	23	28	35	40	46	53
9	5	10	13	18	19	26	29	32	36	38	46	52	7	57	22	58	34	60	45	52
8	4	9	12	17	26	25	28	31	35	37	45	51	6	56	21	46	33	48	61	51
7	3	8	11	16	25	24	27	30	34	56	41	50	55	78	20	45	59	100	50	63
6	2	7	14	15	24	23	37	43	49	55	62	42	44	77	19	88	47	99	49	62
5	1	6	13	14	23	31	36	42	48	54	61	67	43	76	18	87	93	98	105	110
4	4	8	12	18	22	30	35	41	47	53	60	66	71	75	82	86	92	97	104	109
3	3	7	11	17	21	29	34	40	46	52	59	65	70	74	81	85	91	96	103	108
2	2	6	10	16	20	28	33	39	45	51	58	64	69	73	80	84	90	95	102	107
1	1	5	9	15	19	27	32	38	44	50	57	63	68	72	79	83	89	94	101	106
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

<b>Language Skills</b>	Vocabulary	110
	Receptive Language	50
	Expressive Language	63
	Written Language	57





### Mathematics Scores



Growth trajectories for mathematics, by age 8 performance quintile



**Building Success with Quality Instruction**

# OurSCHOOL:



## Student Survey

- Student Engagement
- Student Well-Being
- Bullying and School Safety
- Equity and Inclusive Education
- School Climate
- Career Pathways
- Quality Learning Experiences
- Student Voice
- Student Success
- School Completion

The Teacher and Parent Survey cover other domains



Figure III-9. Quality instruction, by sex and grade

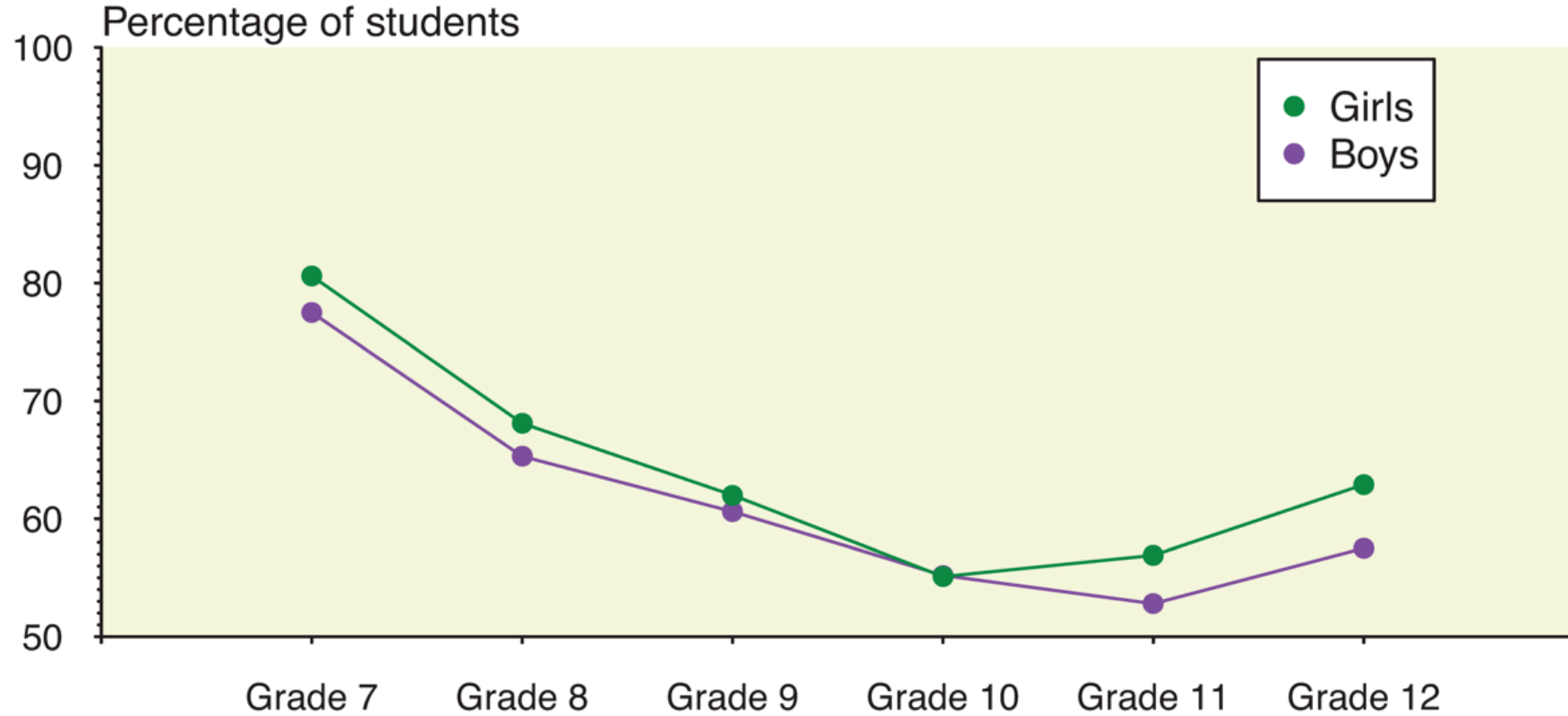
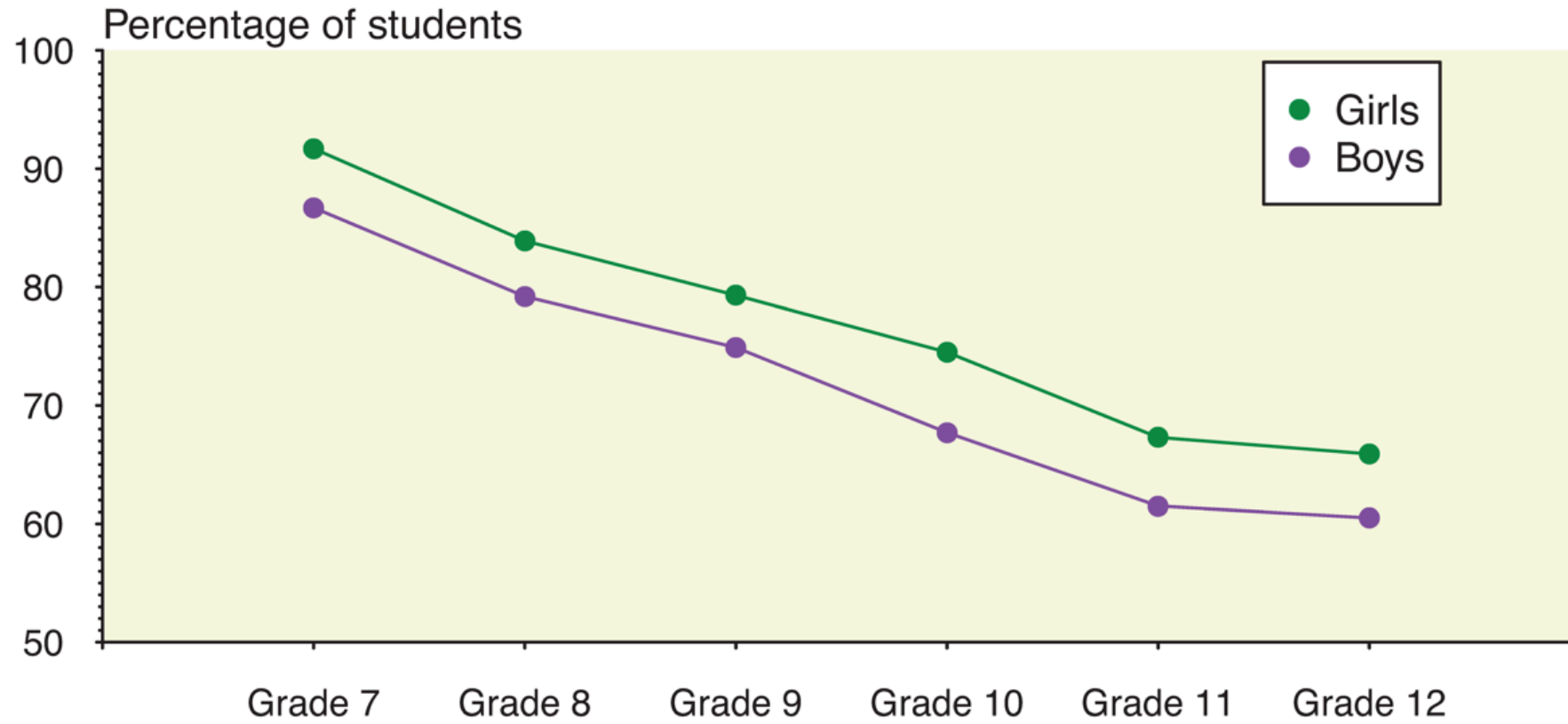


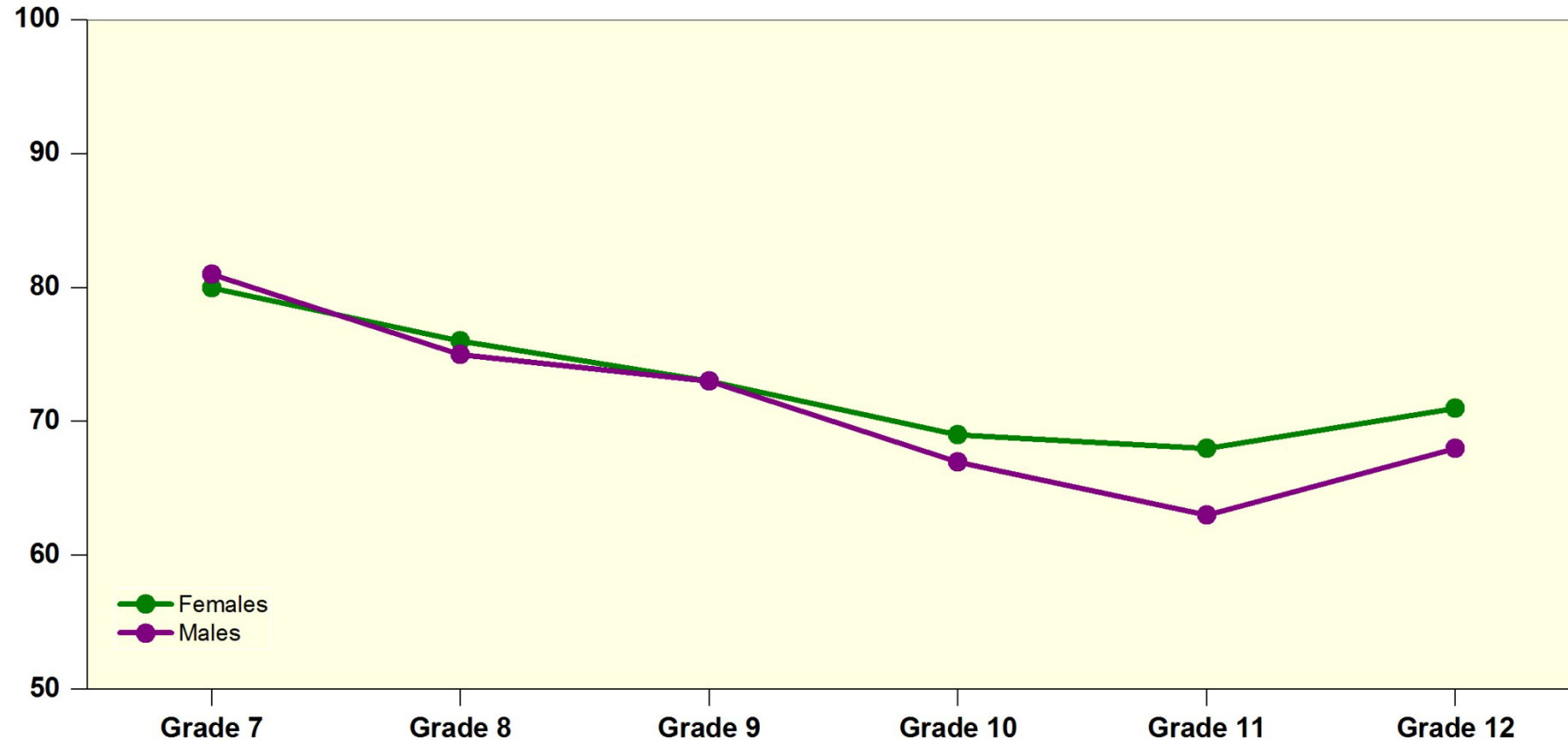
Figure III-4. Values schooling outcomes, by sex and grade





## Effective learning time - secondary

Percentage of Students







# School Completion: Five Types of Students



# Personal Assets related to school completion

Demographic

Academic

Engagement

Social

Institutional

Intellectual

Mental Health

Learning Climate of  
the School

## Data from OurSCHOOL student survey

	Engaged	Dis-connected	Dis-Engaged	Struggling	Alienated
Grades	8.6	8.1	7.9	4.3	5.0
Social Engagement	6.8	5.1	5.3	5.4	3.8
Institutional Engagement	8.3	7.5	7.0	6.3	5.5
Intellectual Engagement	7.6	6.7	5.5	4.3	3.8
Mental Health	8.8	4.6	8.5	8.3	3.1
Percentage of Students	32	17	25	17	9
Probability of Completion	93%	82%	79%	61%	45%



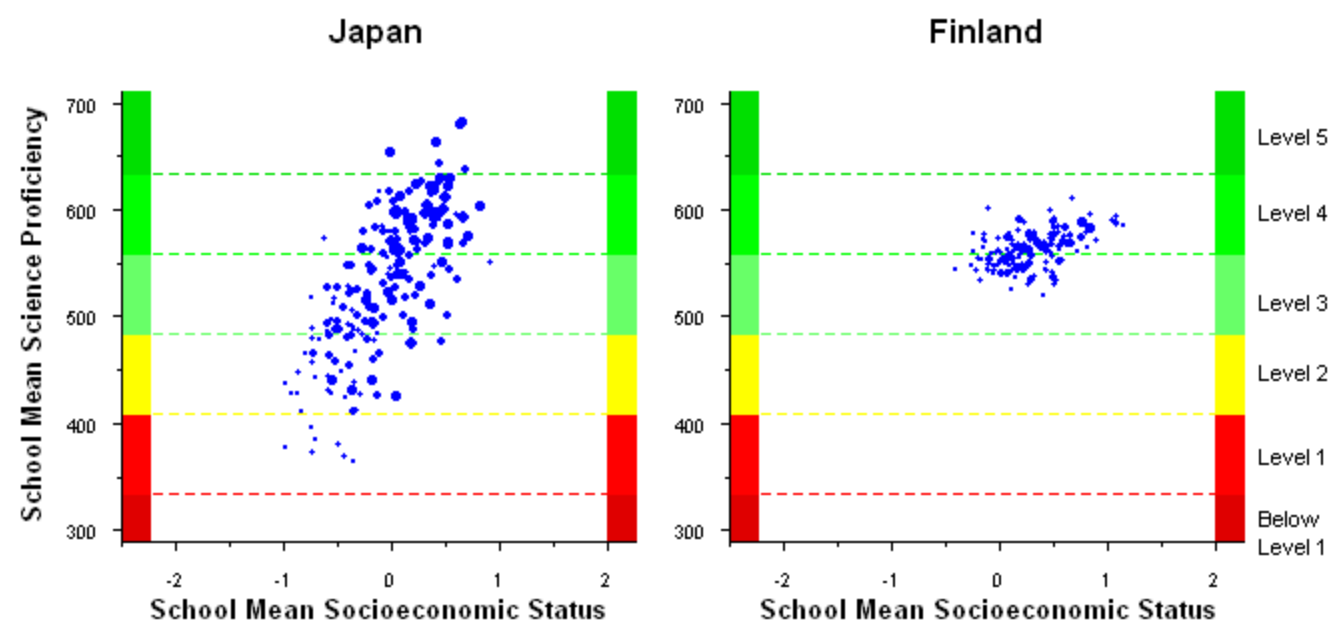
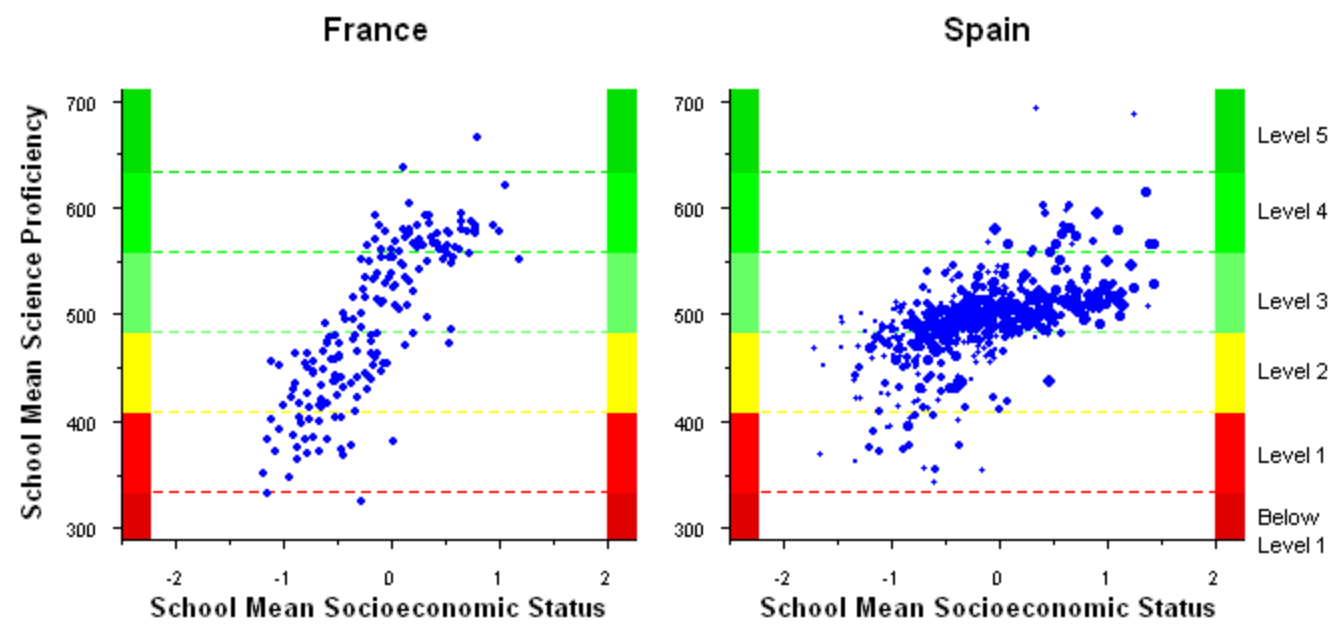
# 4. Selection

When students are successful at one stage of development, their life-course can be altered if they are selected into certain classes, school programs or schools.

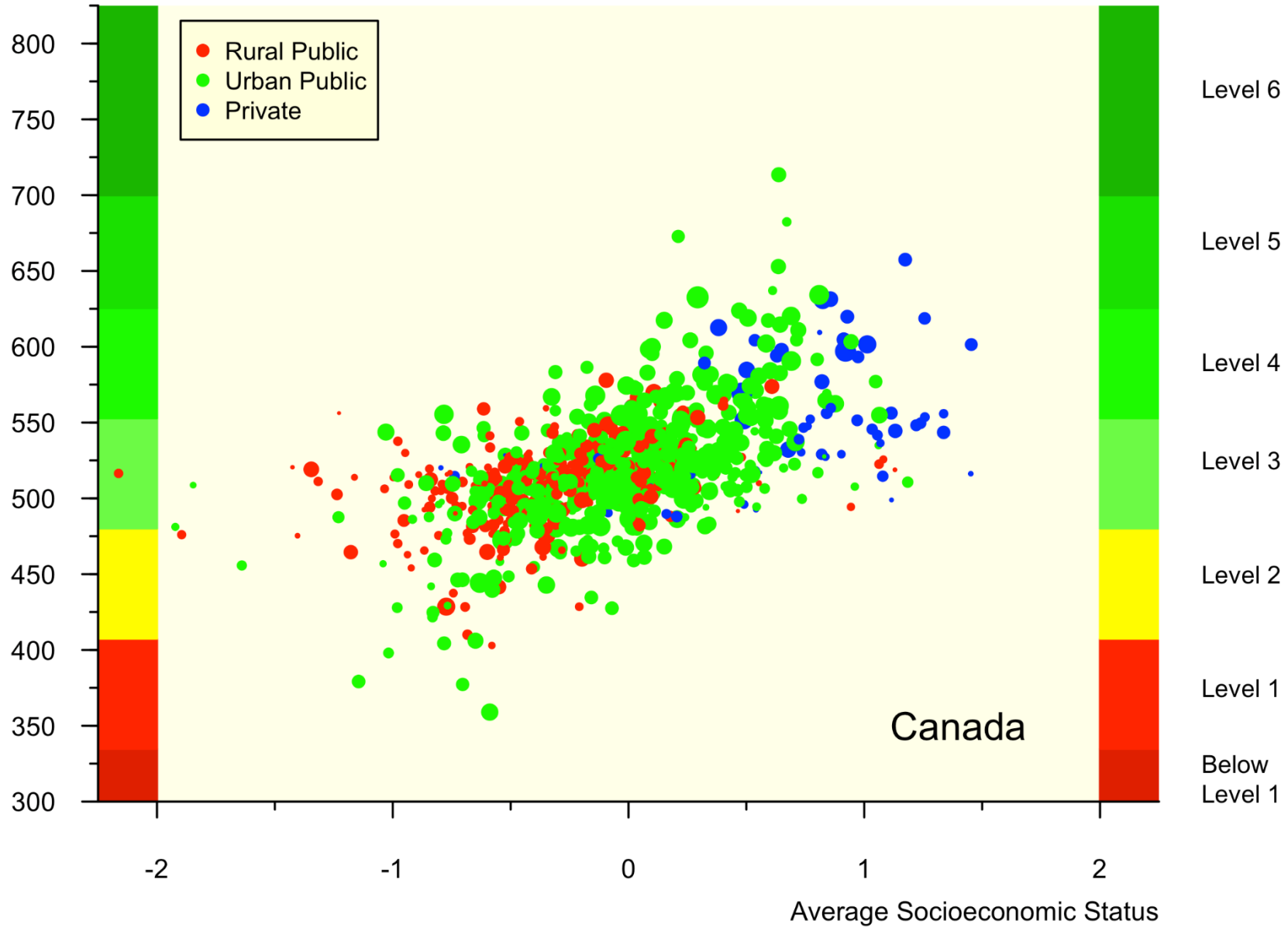
For example, children who have strong reading and language skills are more likely to be streamed into classes or school programs where they benefit from positive peer interactions, a higher quality of instruction, and other factors that enable them to develop their skills at a faster pace.

Children who experience learning difficulties at a particular stage are more likely to be streamed into lower ability classes and have less access to the factors that improve their skills.



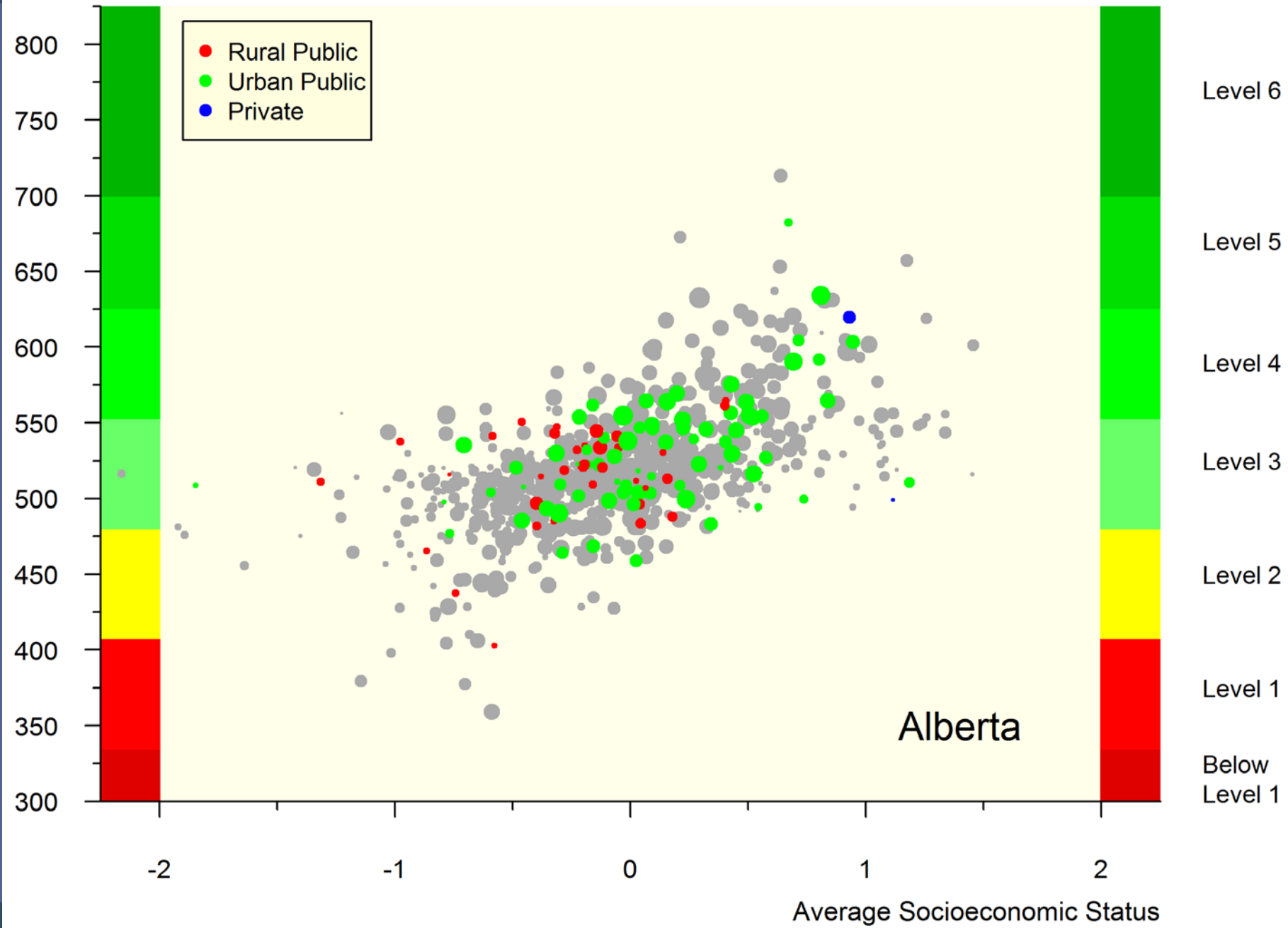


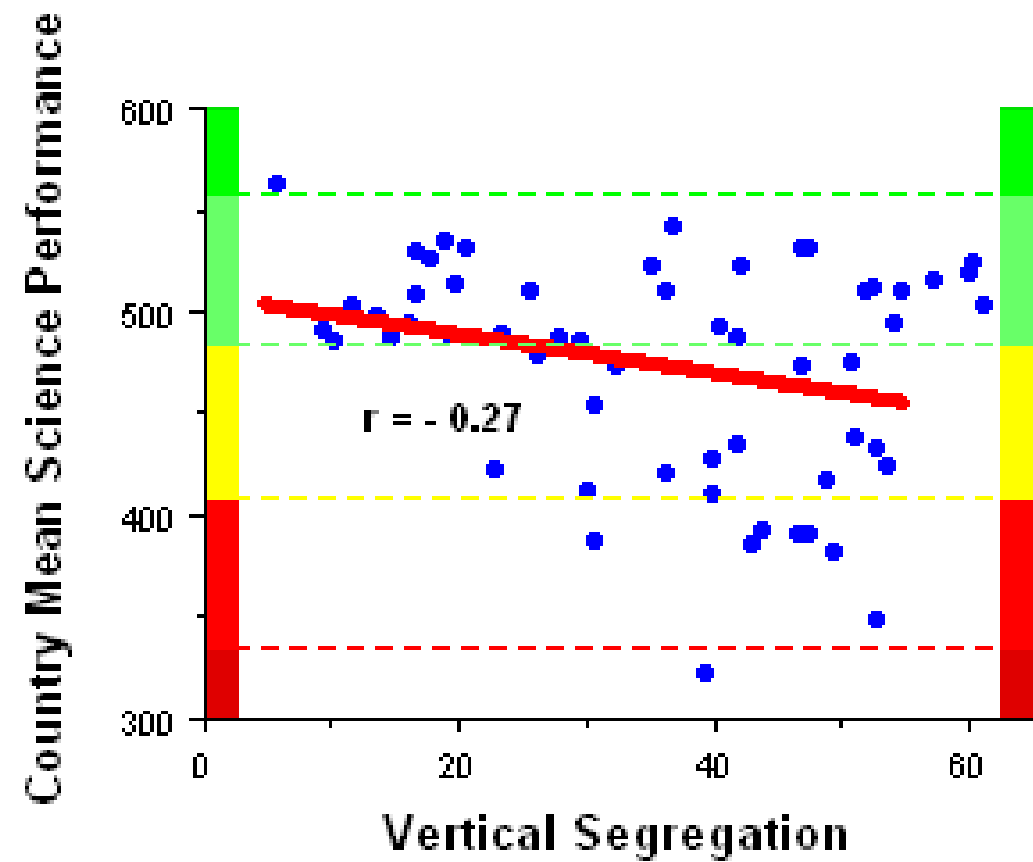
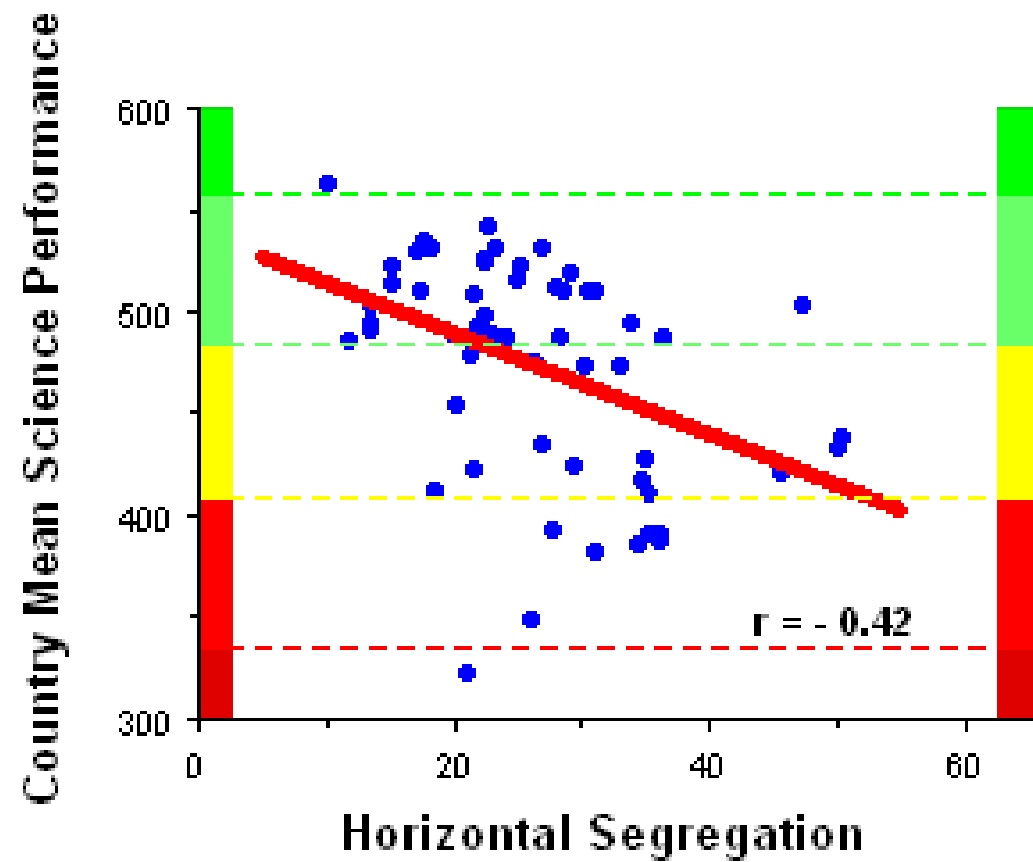
# Average Reading Proficiency



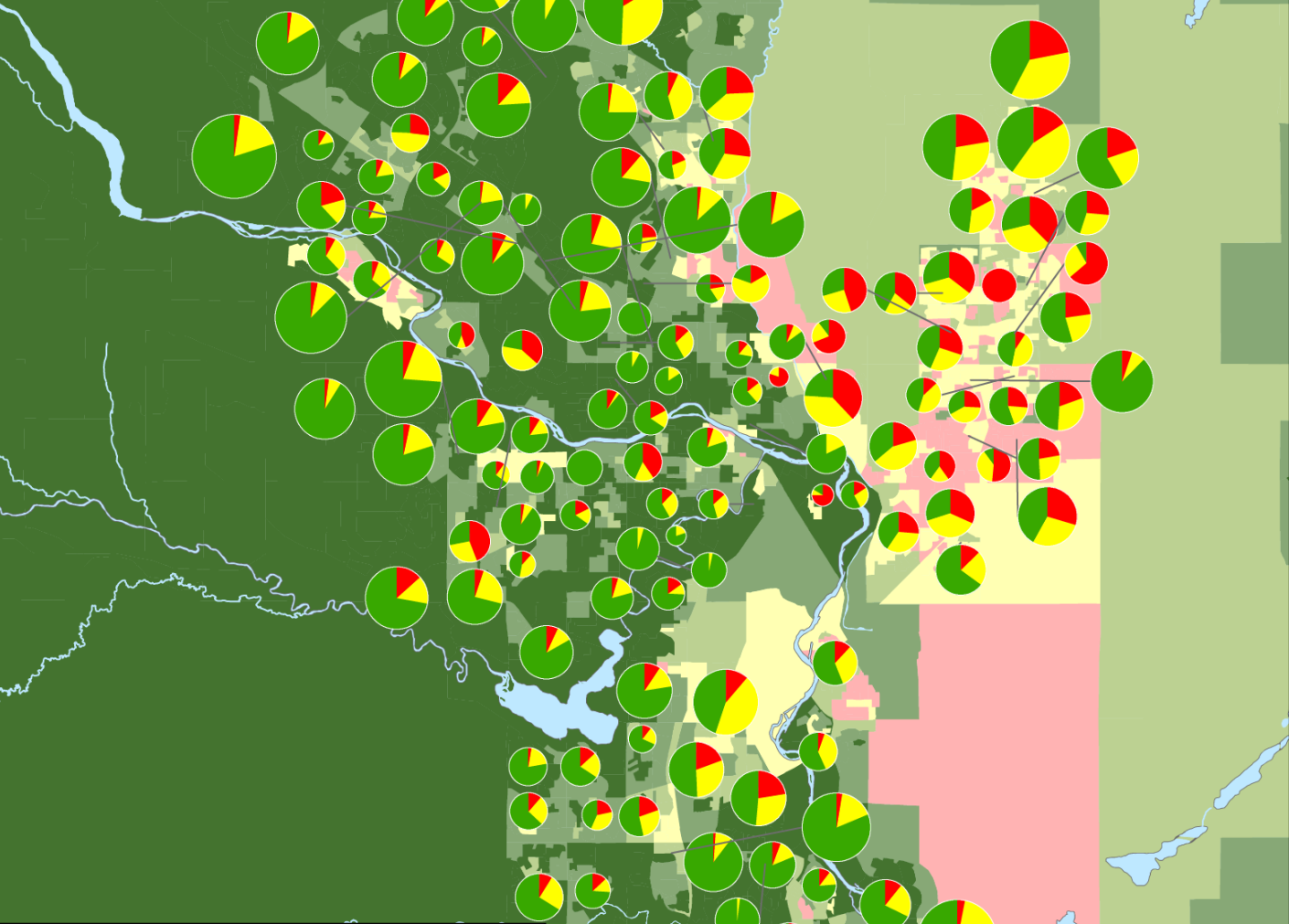


# Average Reading Proficiency



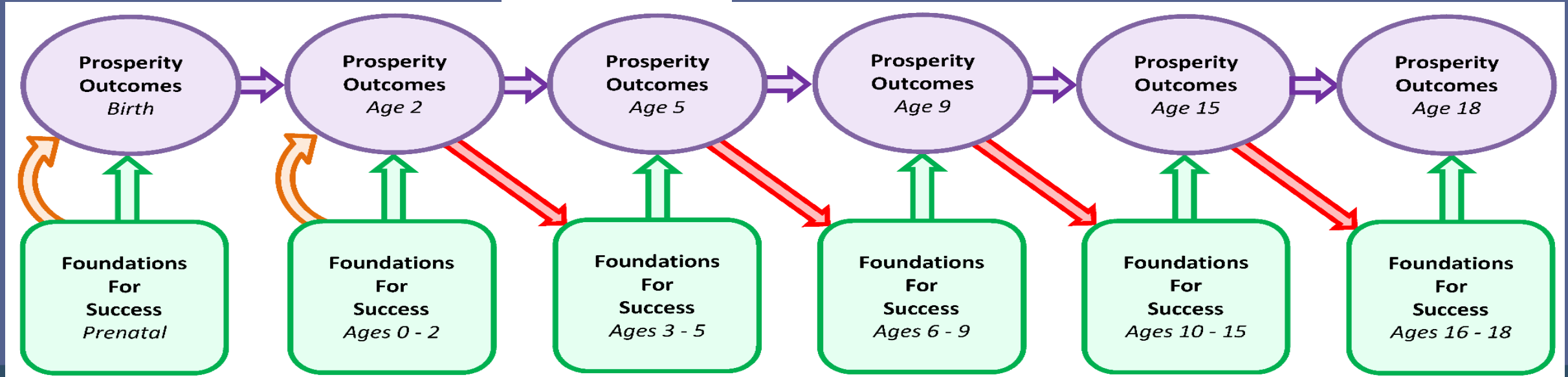
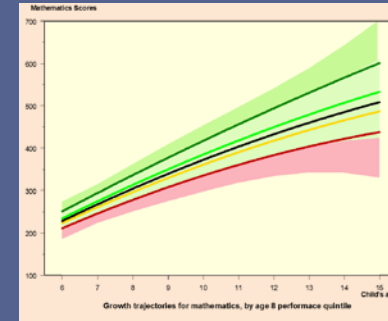
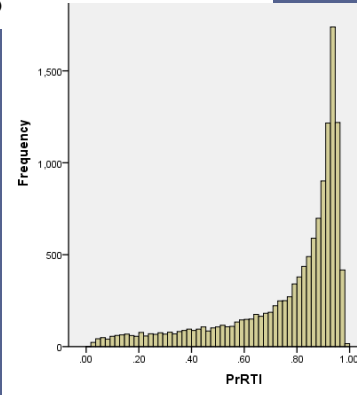
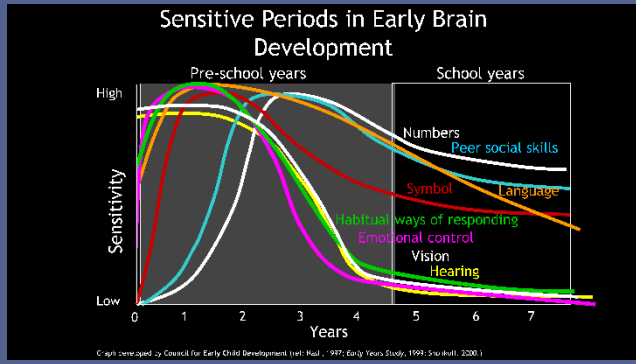
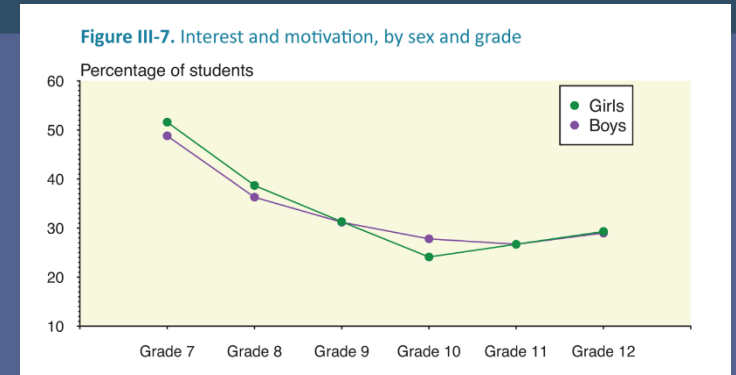
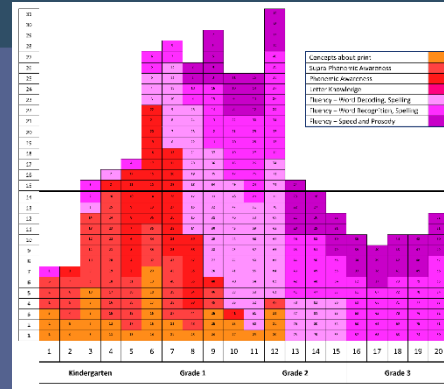
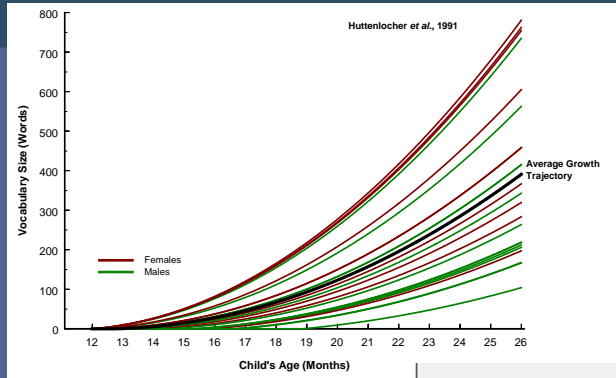


Socioeconomic Status and EYE-TA Responsive Tiered Instruction (RTI) Framework  
 Calgary Board of Education  
 Kindergarten, Fall 2012



<p><b>2006 Census Socioeconomic Status</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: #f08080; border: 1px solid black; margin-right: 5px;"></span> 1 (low)</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: #ffff00; border: 1px solid black; margin-right: 5px;"></span> 2</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: #c0c080; border: 1px solid black; margin-right: 5px;"></span> 3</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: #808080; border: 1px solid black; margin-right: 5px;"></span> 4</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: #404040; border: 1px solid black; margin-right: 5px;"></span> 5 (high)</li> </ul> <p>Source: UNB CRISP and Census 2006</p>	<p><b>EYE-TA Responsive Tiered Instruction (RTI) Framework</b></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Tier 1 (requires quality classroom instruction)</p> <p>Tier 2 (requires quality classroom instruction plus targeted, small-group instruction)</p> </div> <div style="width: 45%;"> <p>Tier 3 (requires quality classroom instruction plus individualized instruction)</p> </div> </div> <p>Size of pie charts is proportional to the number of children surveyed.</p> <p>Source: KSI Research International Inc.</p>
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**Strong leadership**

**Dedicated teachers**

**Family and community support**

**A relentless focus on building  
the foundations for success**





# J. Douglas Willms

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