Self-Regulation at age 5 –
Implications for school readiness

Erin Hetherington

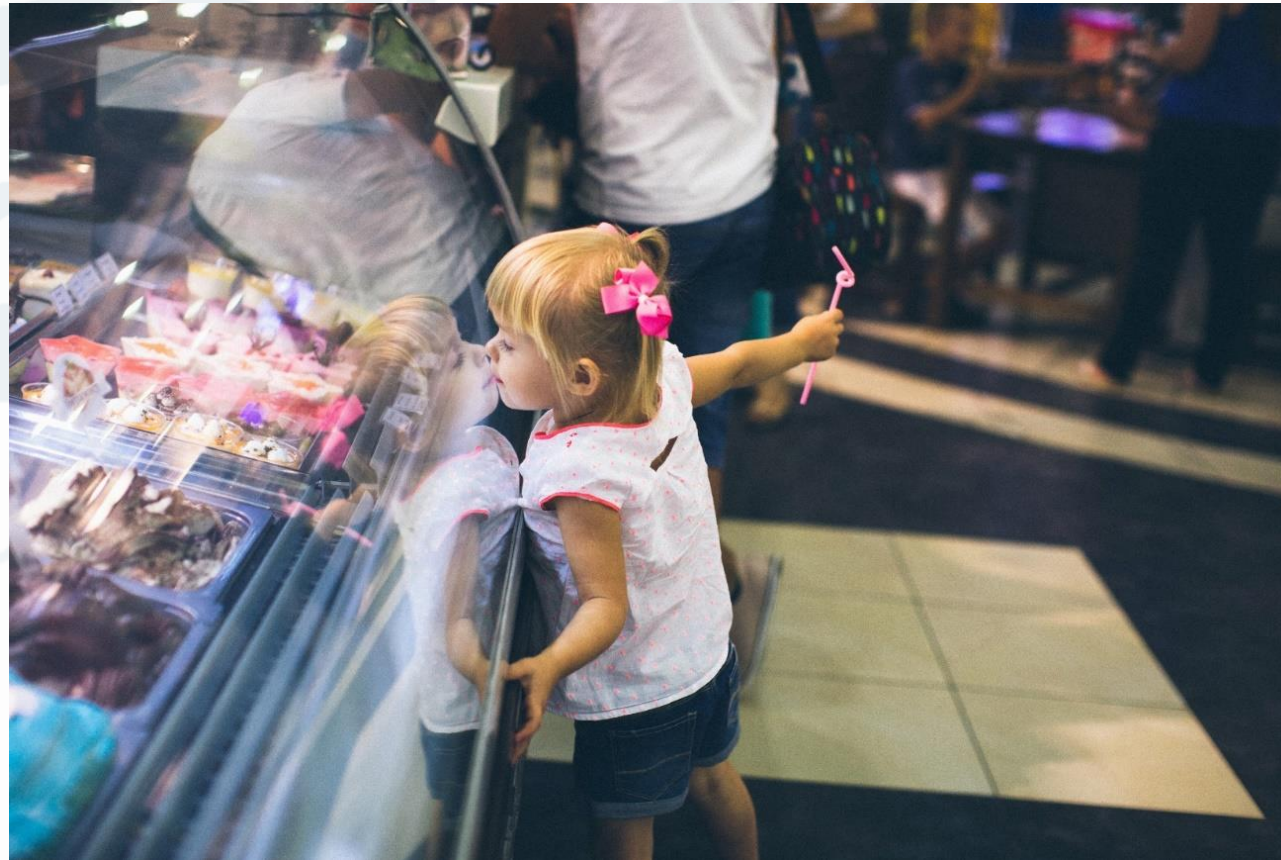**Principal Investigator: Suzanne Tough**

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Disclosure Statement

» I have no affiliation (financial or otherwise) with a pharmaceutical, medical device or communications organization.

What is self-regulation

The ability to monitor and manage emotions, attention and interactions with others and the environment
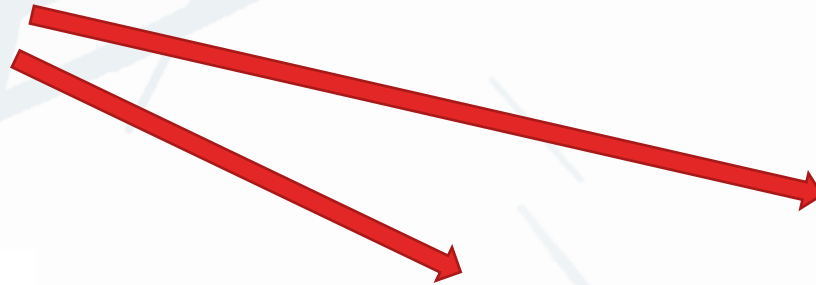
What is self-regulation

The ability to monitor and manage emotions, attention and interactions with others and the environment

Why is self-regulation important?

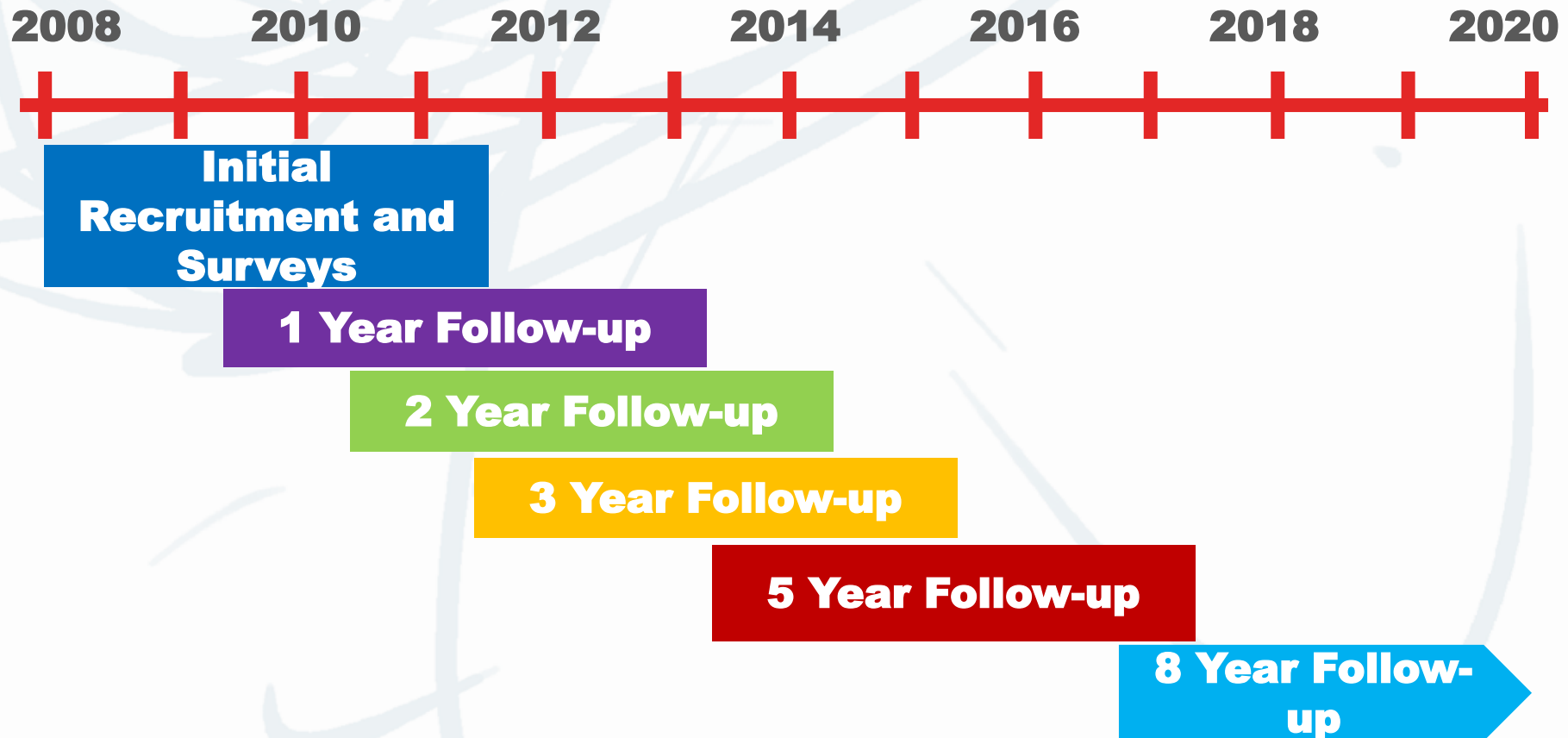# Why is self-regulation important?

Research objective

» To examine which factors are associated with poor self-regulation among children at school entry

    » To understand what factors contribute most to an individual's child's risk of self-regulation challenges

    » To understand what factors contribute most to self-regulation challenges at the population level

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Methods

2008 2010 2012 2014 2016 2018 2020

Initial Recruitment and Surveys

1 Year Follow-up

2 Year Follow-up

3 Year Follow-up

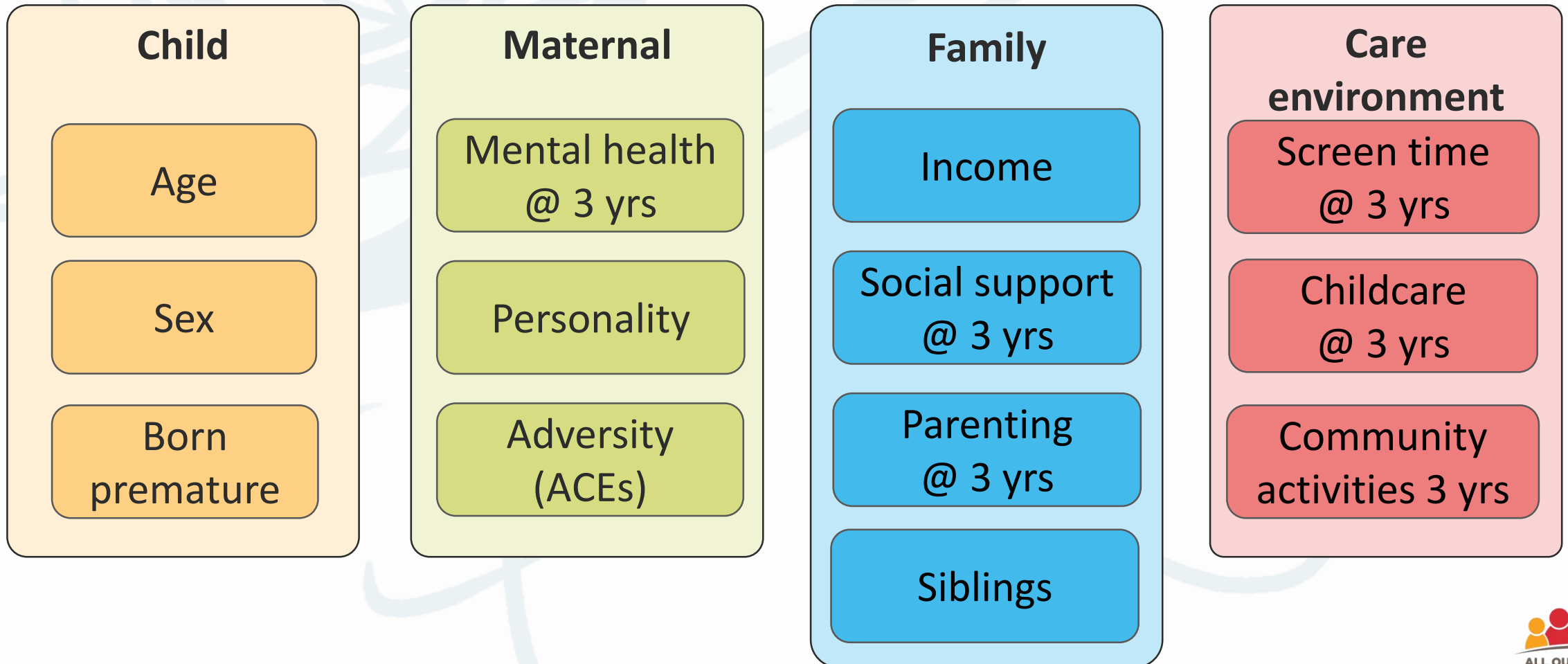5 Year Follow-up

8 Year Follow-up

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Methods

» Sample: Approximately 1600 mothers and children

» Outcome: self regulation at age 5

» Potential risk and protective factors at age 3

» Analysis:

>> » multivariable modified Poisson regression to estimate risk ratios

>> » Population attributable fractions to estimate the effect of interventions to reduce risk factors

Methods

Potential risk and protective factors:

Child
- Age
- Sex
- Born premature

Maternal
- Mental health @ 3 yrs
- Personality
- Adversity (ACEs)

Family
- Income
- Social support @ 3 yrs
- Parenting @ 3 yrs
- Siblings

Care environment
- Screen time @ 3 yrs
- Childcare @ 3 yrs
- Community activities 3 yrs

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How did we measure self-regulation?

- Acts without thinking
- Argues when denied own way
- Cannot wait to take turn
- Adjusts well to family plans

Emotional Self Control

- Changes moods quickly
- Is easily upset
- Gets very upset when things are lost

Executive Function

Attention

- Is easily distracted
- Pays attention when being spoken to
- Listens carefully

Results: Participant Characteristics

Child Characteristics	N	%
Child age in months- mean (sd)	61.5	(3.0)
Male	763	48%
Born preterm	96	6.1%
Maternal Characteristics		
Depressive symptoms (CESD ≥16)	185	11.5%
Anxiety symptoms (SSAI≥40)	230	14.3%
High neuroticism (1sd above mean)	241	15.0%
4 or more ACEs	218	13.6%

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Results: Family Characteristics

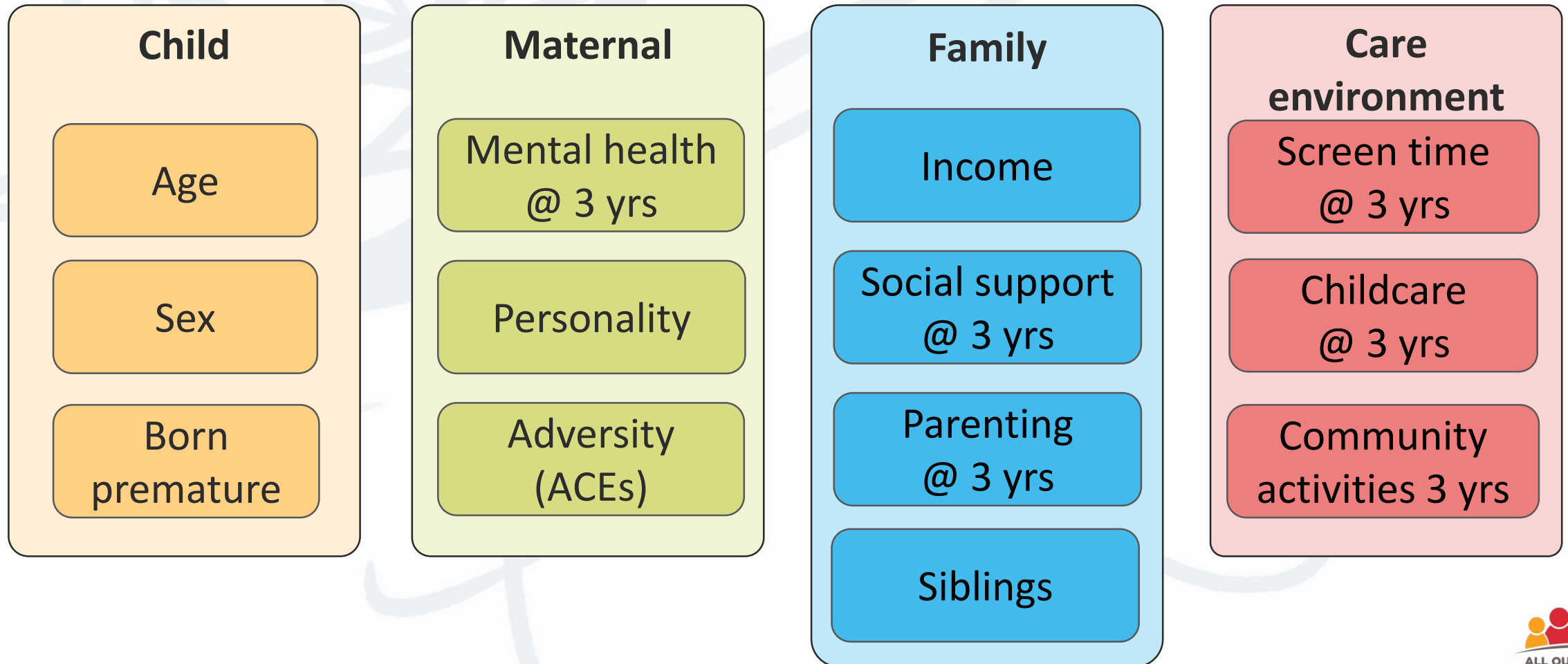| Family Characteristics	N	%
Lower income (< $60,000)	166	10.0%
Low social support @ 3 yrs	346	21.5%
High ineffective/hostile parenting behaviours @ 3 yrs	247	15.4%
More than one child at home	1243	77.4%
Care environment		
10 or more hrs in childcare or preschool per week @ 3 yrs	566	35.3%
Does not use community resources @ 3 yrs	274	17.1%
1 hour or more of TV per day @ 3 yrs	825	51.4%

Results

» 21.5% of children in our study had self-regulation challenges (n=345)

» Half scored at risk on 1 scale (attention, executive function or emotional self-control)

» Approximately one quarter scored at risk on 2 factors
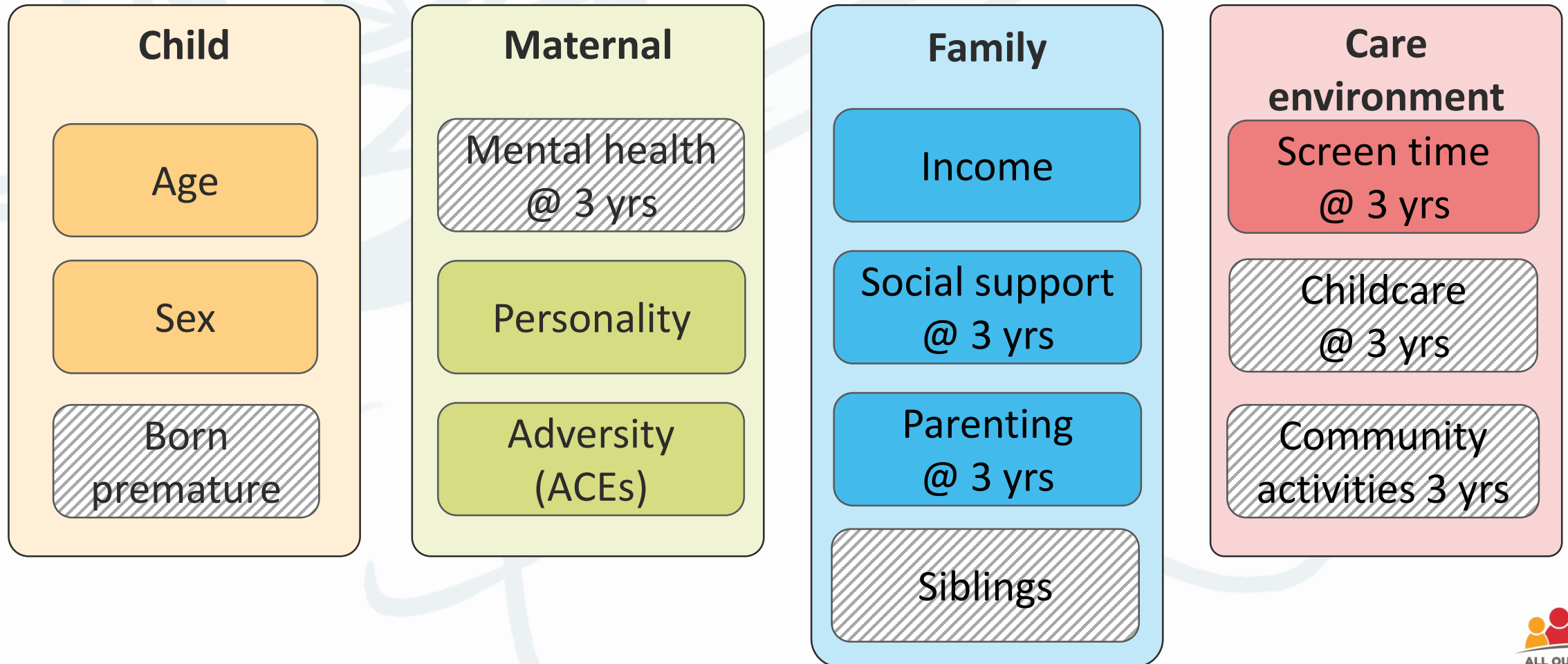
» One fifth scored at risk on all three

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Results

Potential risk and protective factors:

Child	Maternal	Family	Care environment
Age	Mental health @ 3 yrs	Income	Screen time @ 3 yrs
Sex	Personality	Social support @ 3 yrs	Childcare @ 3 yrs
Born premature	Adversity (ACEs)	Parenting @ 3 yrs	Community activities 3 yrs
		Siblings	

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Results

Statistically significant risk factors

Individual risks

1) High ineff. parenting behav. @ 3 yrs
2.05 (1.68, 2.49)

2) High maternal neuroticism
1.67 (1.35, 2.07)

3) Lower Income
1.39 (1.09, 1.77)

4) Low social support @ 3 yrs
1.32(1.07, 1.64)

5) High maternal ACEs
1.29 (1.03, 1.61)

6) ≥1 hr screen/day @ 3 yrs
1.25 (1.04, 1.50)

7) Male
1.22 (1.01, 1.46)

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Individual vs. population risks

Individual risks:

1) High ineff. parenting behav. @ 3 yrs
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1.22 (1.01, 1.46)

Population risks:

High ineff. parenting behav. @ 3 yrs
3.4% (2.4, 4.5)

≥1 hr screen/day @ 3 yrs ★
2.5% (0.4, 4.6)

High maternal neuroticism ★
2.5% (1.4, 3.6)

Low social support @ 3 yrs
1.4% (0.3, 2.6)

Lower Income ★
0.9% (0.1, 1.6)

Expected reduction at population level

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Individual vs. population risks

1) **High ineff. parenting behav. @ 3 yrs**
2.05 (1.68, 2.49)

2) **High maternal neuroticism**
1.67 (1.35, 2.07)

3) **Lower Income**
1.39 (1.09, 1.77)

4) **Low social support @ 3 yrs**
1.32(1.07, 1.64)

5) **High maternal ACEs**
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6) **≥1 hr screen/day @ 3 yrs**
1.25 (1.04, 1.50)

7) **Male**
1.22 (1.01, 1.46)

High ineff. parenting behav. @ 3 yrs
~13 500

≥1 hr screen/day @ 3 yrs
~10 000 ★

High maternal neuroticism
~10 000 ★

Low social support
~6 000

Lower Income
~3 500 ★

Expected reduction at population level

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Conclusion

» Self-regulation is influenced by factors at the individual, family and broader environmental levels.

» Strategies that support parental well-being and decrease ineffective parenting practices could benefit children.

» Support for families in the preschool years can help ensure that children are ready to learn once they reach school.

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Thank you

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Family Characteristics

	N	%
Family Income		
Less than $60,000	173	9%
$60,000-$100,000	424	22%
$100,000-$150,000	602	31%
$150,000 or more	723	38%
Marital Status (mother)		
Married/common-law	1832	95%
Single/separated	104	5%
Maternal Education		
High school or less	289	17%
Post-secondary degree	1399	83%

Family Characteristics

	N	%
Language at home		
English as a first language	**1792**	**90%**
English as a second language	**191**	**10%**
Mom working		
Yes	**1405**	**73%**
No	**531**	**27%**
Siblings		
Only child	**395**	**20%**
Has siblings	**1559**	**80%**

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Participants

	N	%
Child Sex		
Female	**937**	**48%**
Male	**1029**	**52%**
In Kindergarten		
Full Day	**227**	**12%**
Half Day	**651**	**33%**
Not in kindergarten	**1086**	**55%**

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How do the components of self regulation relate to one another?

Emotional Self Control 23%

17%

3%

20%

Executive Function 8%

8%

Attention 21%

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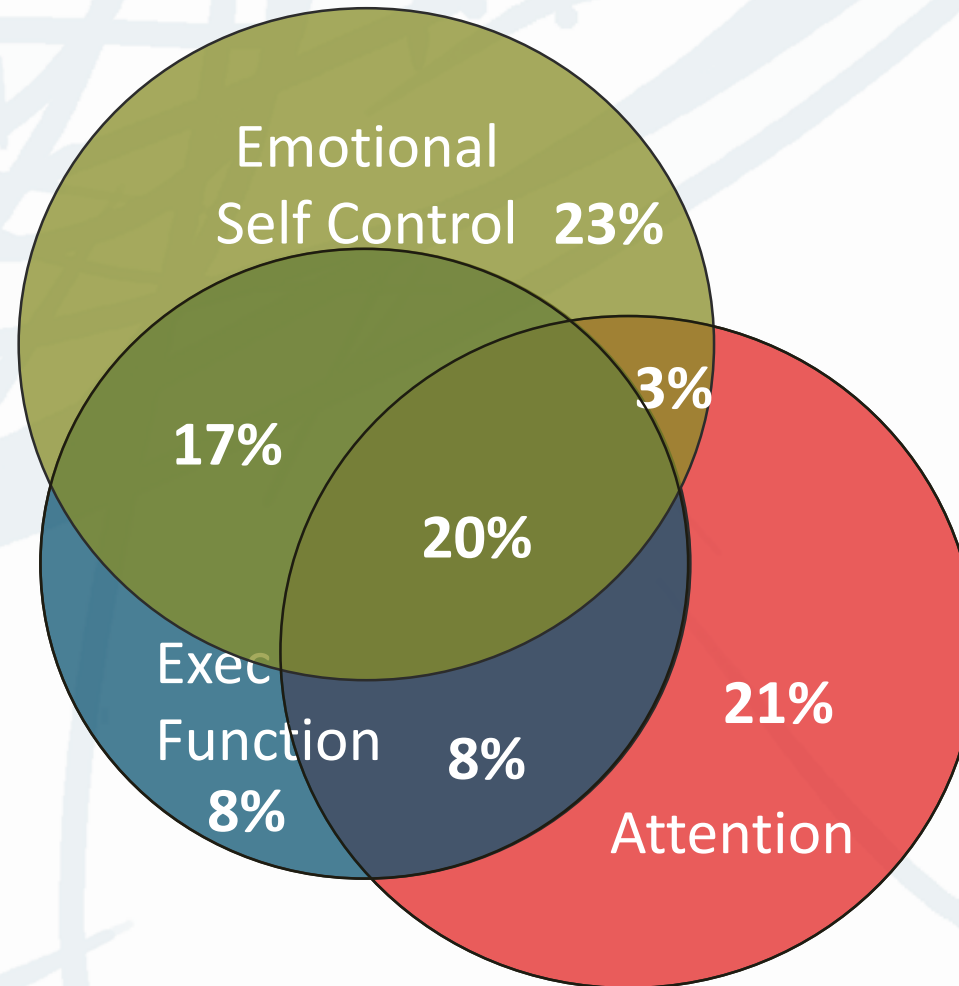
Results

	% of sample	RR	95% CI	Expected prevalence	
Lower family income	10%	1.39	(1.09, 1.77)	20.6%	(18.7, 22.7)
Male	52%	1.22	(1.01, 1.46)		
Maternal ACEs (≥4)	14%	1.29	(1.03, 1.61)		
Maternal neuroticism	15%	1.67	(1.35, 2.07)	19.0%	(17.0, 21,2)
Low social support at age 3	16%	1.32	(1.07, 1.64)	20.0%	(17.9, 22.3)
Ineffective parenting at age 3	15%	2.05	(1.68, 2.49)	18.1%	(16.1, 20.2)
Screens (≥ 1hr daily) at age 3	52%	1.25	(1.04, 1.50)	19.0%	(16.4, 21.9)

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Boys

» Risk Ratio: 1.22 (1.01, 1.46)

» Percentage with this characteristic: 52%

» Potential

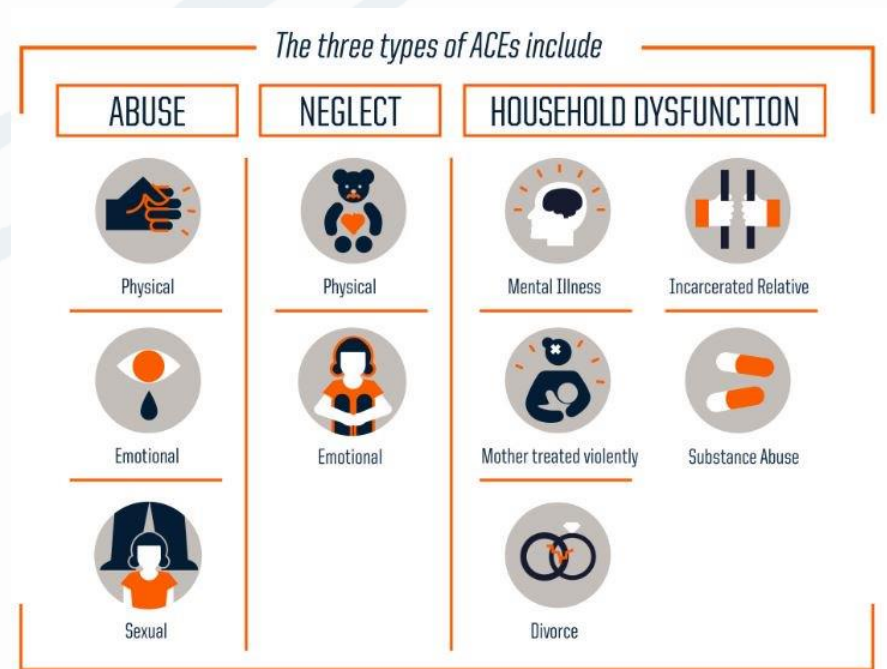 mechanisms:

  » Biological factors
  » Gendered factors

Maternal ACEs

» Risk Ratio: 1.29 (1.09, 1.61)

» Percentage with

this characteristic: 14%

» Potential mechanisms:
  » Parenting confidence
  » Parenting style

The three types of ACEs include

ABUSE	NEGLECT	HOUSEHOLD DYSFUNCTION	
Physical	Physical	Mental Illness	Incarcerated Relative
Emotional	Emotional	Mother treated violently	Substance Abuse
Sexual		Divorce	

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Maternal personality

» Risk Ratio: 1.67 (1.35, 2.07)

» Percentage with this characteristic: 15%

» Suggestions for addressing this factor:

  » Encourage promotion of child autonomy

  » Promote positive coping mechanisms

» Expected prevalence if

  this could be addressed:

  21% ➡ 19%

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Social Support

» Risk Ratio: 1.32 (1.07, 1.64)

» Percentage with this characteristic: 16%

» Suggestions for addressing this factor:

  » Normalize help-seeking behaviour

  » Support community activities and supports

» Expected prevalence if this could be addressed:

  21% ➡ 20%

Ineffective parenting at age 3

» Risk Ratio: 2.05 (1.68, 2.49)

» Percentage with this characteristic: 15%

» Suggestions for addressing this factor:

  » Many parenting styles are positive

  » Reduce some ineffective behaviours

» Expected prevalence if this could be addressed:

21% ➡ 18%

Screen time at age 3

» Risk Ratio: 1.25 (1.04, 1.50)

» Percentage with this characteristic: 52%

» Suggestions for addressing this factor:
  » Limit screen time to less than 1 hour per day (under 5)
  » Take screens out of daily routines
  » Monitor screen time and co-view
  » Model good screen behaviour

» Expected prevalence if this could be addressed:

21% ⟶ 18%

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