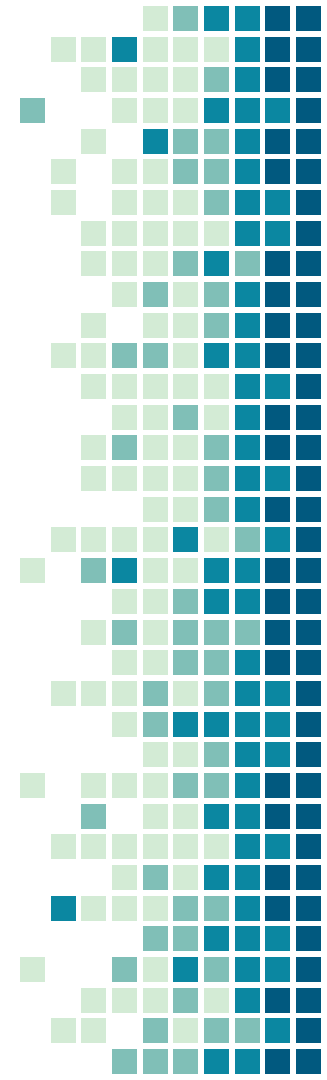
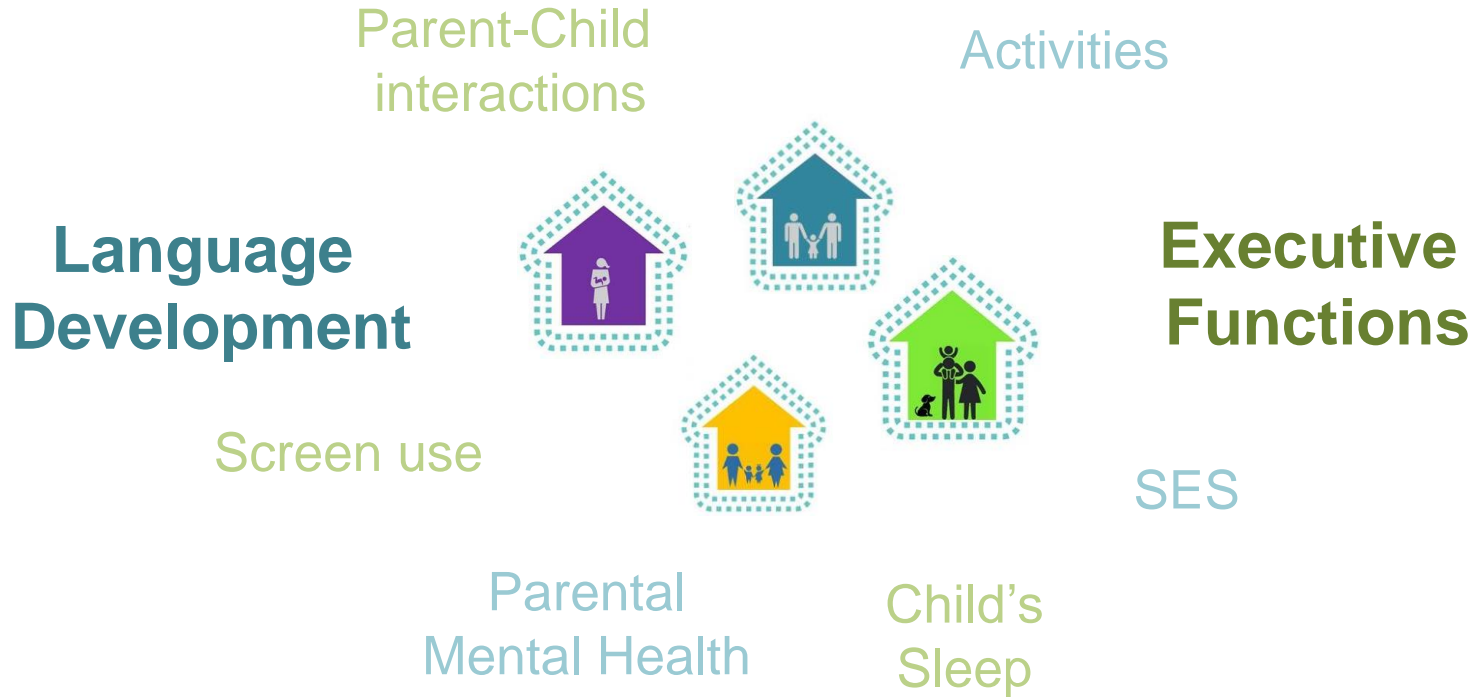


# The impact of Covid-19 on children's SLC, executive function and sleep

Nayeli Gonzalez-Gomez , Catherine Davies, Alexandra Hendry, Teodora Gliga, & Michelle McGillion



# Our Study

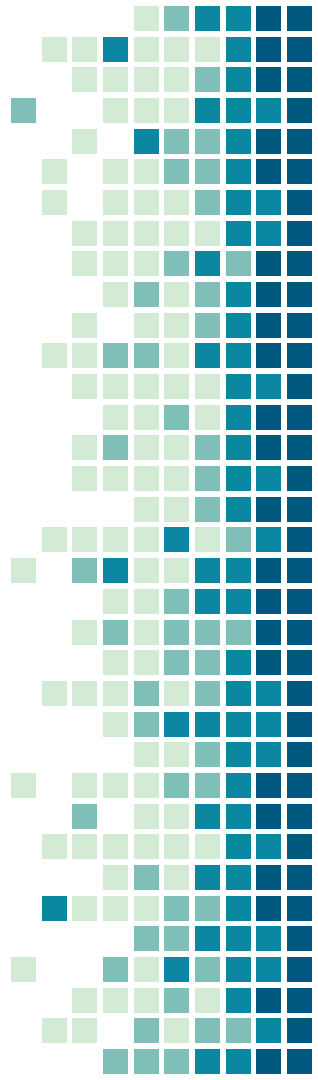




# Executive Functions

Cognitive  
"Thinking skills"

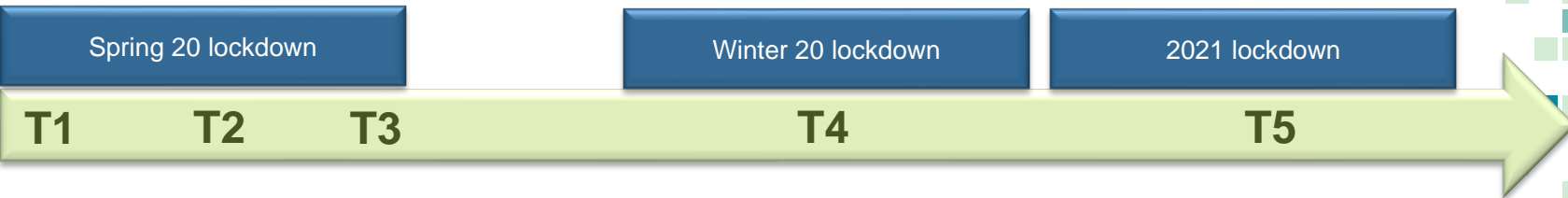
Regulation







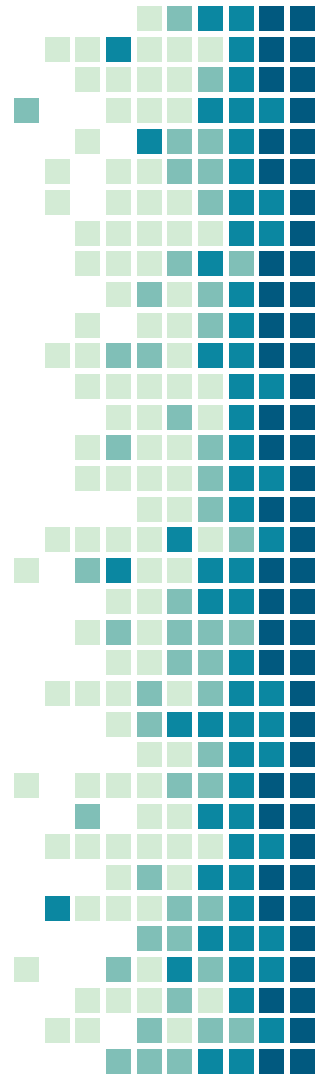
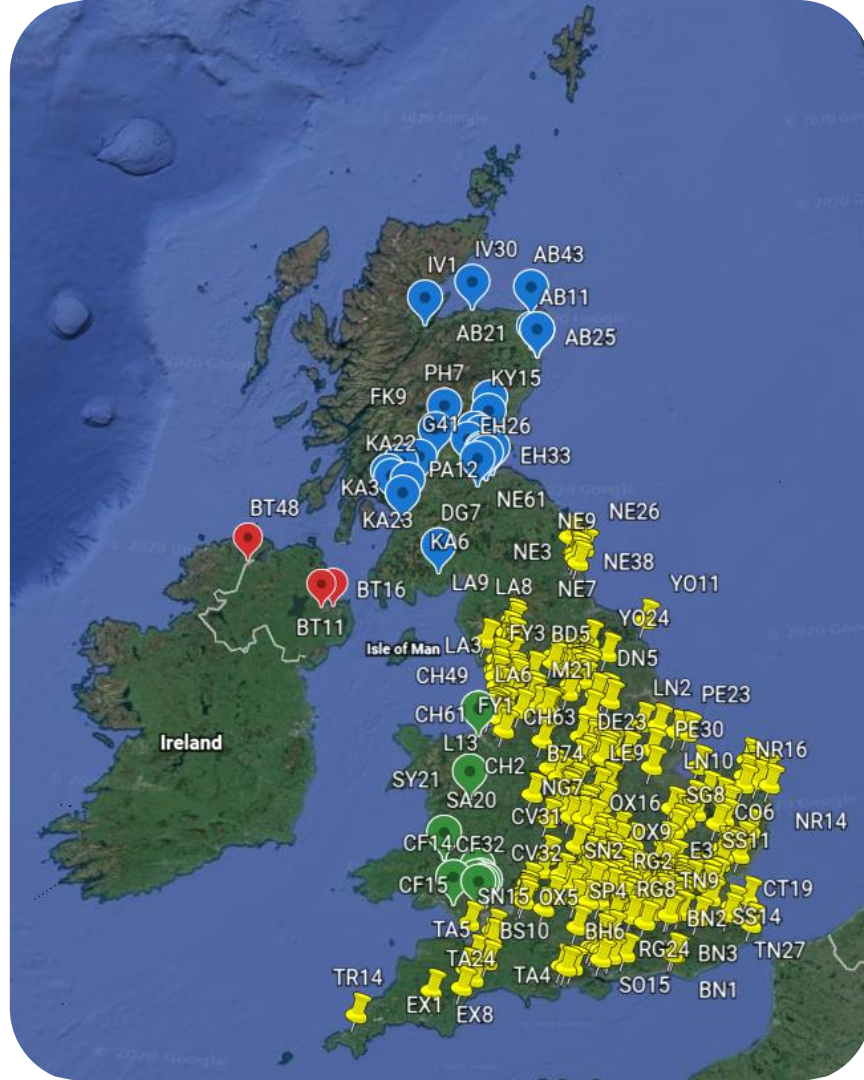
# Methods

## Participants:

- 892 families with 8-to-36-month  
( $M_{\text{age}} = 19\text{m } 20\text{d}$ ; 452 girls)
- 532 completed T1/T2 + T3
- 251 completed + T4
- 345 completed + T5



	SDDS	UK 2019 population	
England	93%	84%	
Scotland	4%	8%	
Wales	2%	5%	
NI	1%	3%	



# Socio-economic status

- 1) Index of Multiple Deprivation (1-10).

**$M_{\text{IMD}}=6.86$  (SD = 2.59; Range 1-10)**

- 1) Income: total household income (1-7):

1) £0-20k 2) £21-30k 3) £31-40k 4) £41-50k 5) £51-60k 6) £61-70k 7) £71k+

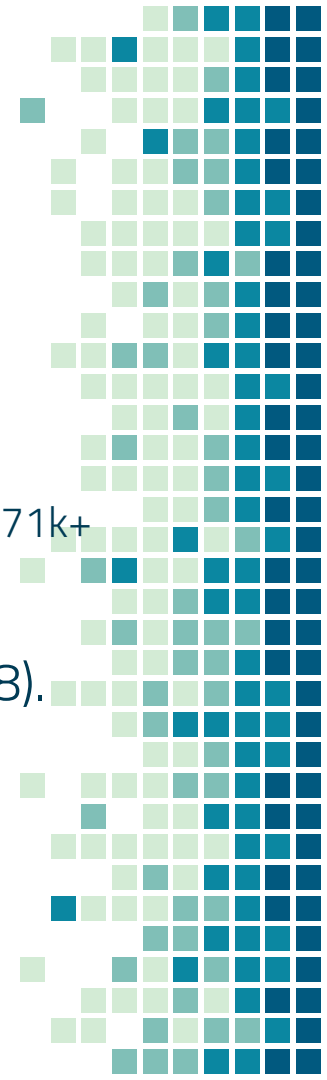
**$M_{\text{HI}}=4.92$  (SD = 1.92; Range 1-7)**

- 3) Parental education: highest level of education completed (1-8).

**$M_{\text{HE}}=5.25$  (SD = 1.15; Range 2-8)**

- 3) Parents' occupational prestige (1-9; Ellefson et al., 2020).

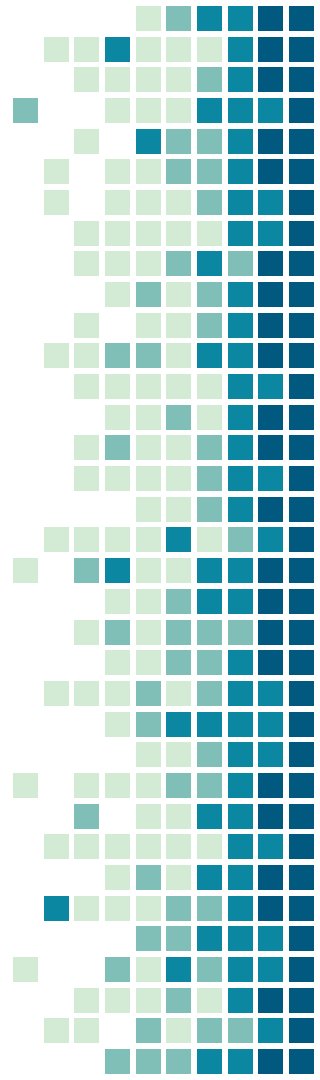
**$M_{\text{OP}}=6.84$  (SD = 1.73; Range 2-9)**



# Methods

## Online Questionnaire:

- T1- 0-6weeks Post-Lockdown
- T2- 7-10 weeks Post-Lockdown
- T3- 11-15 weeks Post-Lockdown
- T4- ~6 months Post-Lockdown
- T5- ~12months Post-Lockdown



**Time 1: Baseline**  
± 3 weeks post  
Lockdown

**Time 2 - Midpoint**  
± 8 weeks post  
Lockdown

**Time 3– End Point**  
± 13 weeks post  
Lockdown

**Time 4– End Point**  
November Lockdown  
6 months after

**Family's Background:**  
Demographic questionnaire

**Parenting:** Early Parenting  
Attitudes questionnaire

**Language:** Oxford CDI

**Screen Time:** Average  
time spent on smartphone

**Screen Time:** Average  
time spent on smartphone

**Sleep:** Sleep and Settle  
Questionnaire

**Parent-child  
interactions:** 10 min

**Executive Functions:**  
Early Executive Functions  
Questionnaire

**Mental Health:**  
Depression Anxiety  
Stress Scale

**Language:** Oxford CDI

**Screen Time:** Average  
time spent on smartphone

**Sleep:** Sleep and Settle  
Questionnaire

**Parent-child  
interactions:** 10 min  
recordings

**Home Activities:**  
Caregiver-Child/Child-only  
Activities Questionnaire

**Language:** Oxford CDI

**Screen Time:** Average  
time spent on smartphone

**Parent-child  
interactions:** 10 min  
recordings

**Executive Functions:**  
EEFQ + Brief-P

**Mental Health:** DASS-

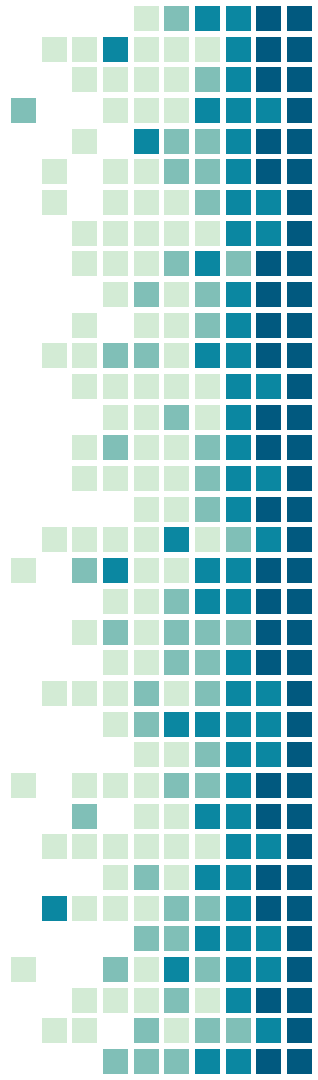
**Home Activities**  
Questionnaire





# Results

**PRELIMINARY**

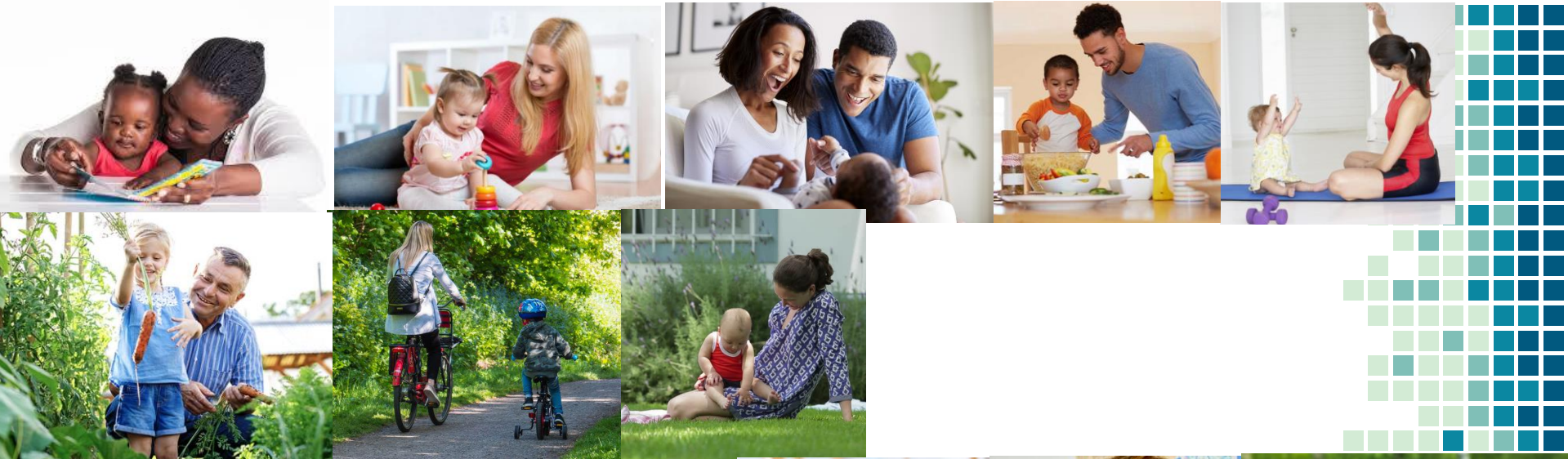




What were babies doing  
during lockdown?

# Parent-child activities





# Increase in time doing indoor/outdoor activities

Hendry, Gibson, Davies, Gliga, McGillion & Gonzalez-Gomez, submitted



## Increase in screen time

Hendry, Gibson, Davies, Gliga, McGillion & Gonzalez-Gomez, submitted



# During Spring Lockdown Lower-SES:

## - Enriching Activities



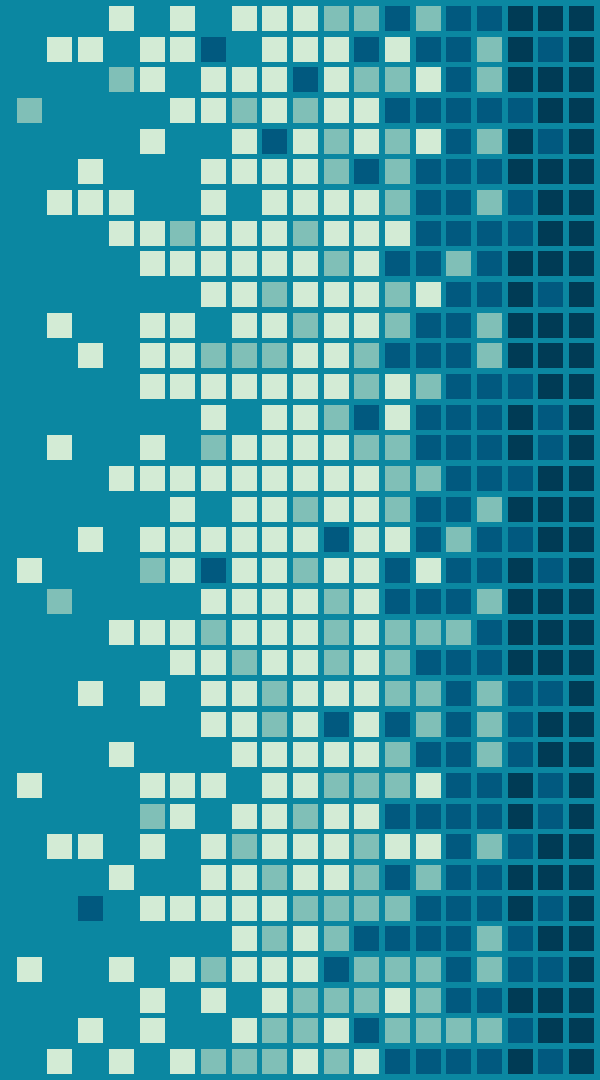
+ Screen

# Links between SES and parenting activities





# Language Development

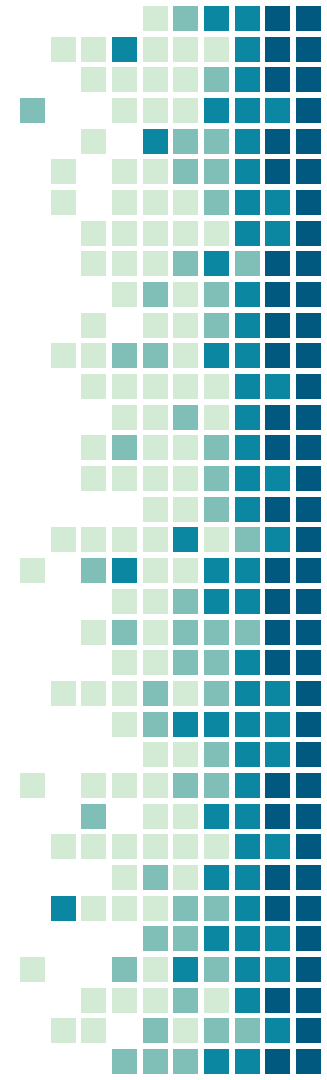




# Language skills

■ **Comprehension**

■ **Production**



# Were language skills related to enriching activities during lockdown?



Linked to





Enriching activities during lockdown was linked to expressive language

Spring 2020 Lockdown



$(F(3,400) = 16.6, P < .001, R^2 = .11)$



# Activities and Language Growth

$r=.18, p<0.01$



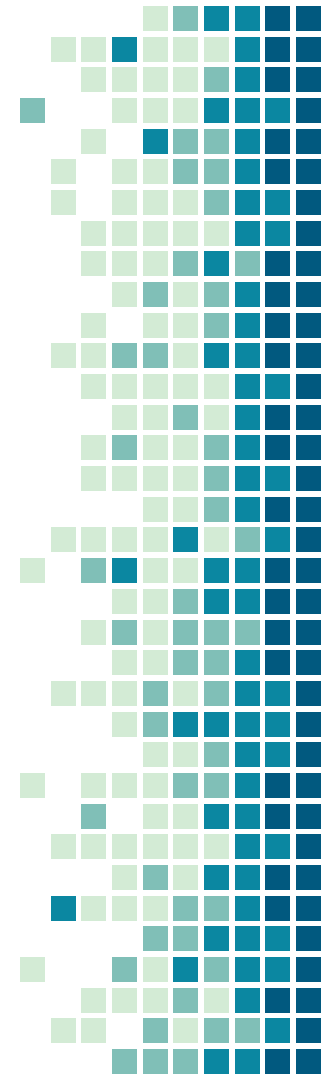
$r=.15; p<.01$



$r=.16; p=0.01$



$r=.18, p<0.05$





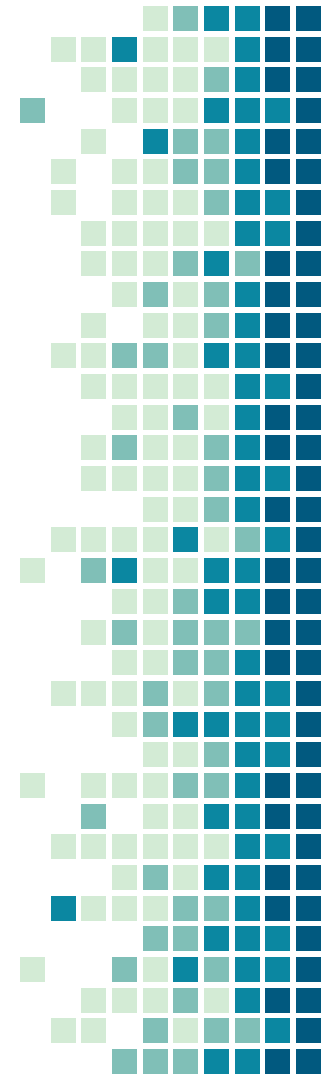
# Parent-Child Interactions

# Caregiver-Child Interactions

High-quality,  
caregiver-child  
interactions



Child  
communicative  
abilities

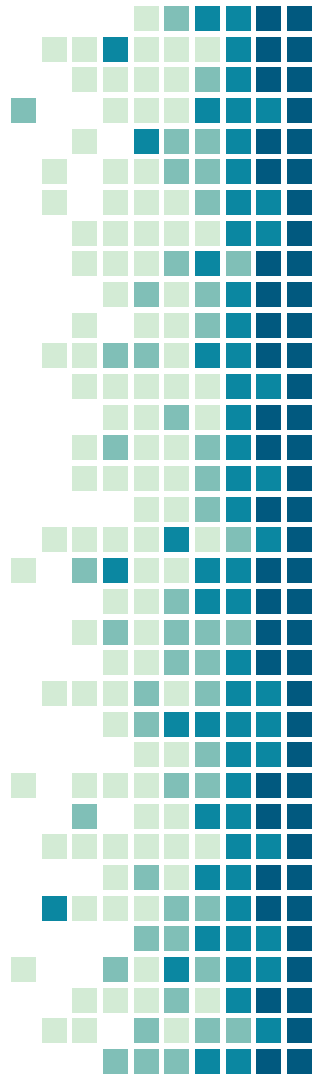


# Caregiver-child interactions



- Sensitivity
- Responsiveness

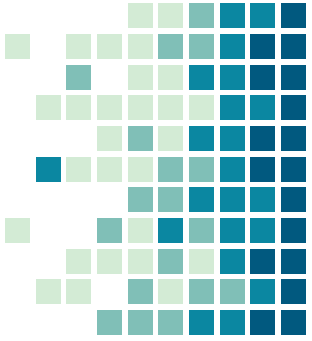
Global Rating Scales (GRS)  
for mother-infant interaction  
(Murray, Fiori-Cowley, Hooper, &  
Cooper, 1996)



# Expressive Vocabulary



# Enriching Activities



Linked to



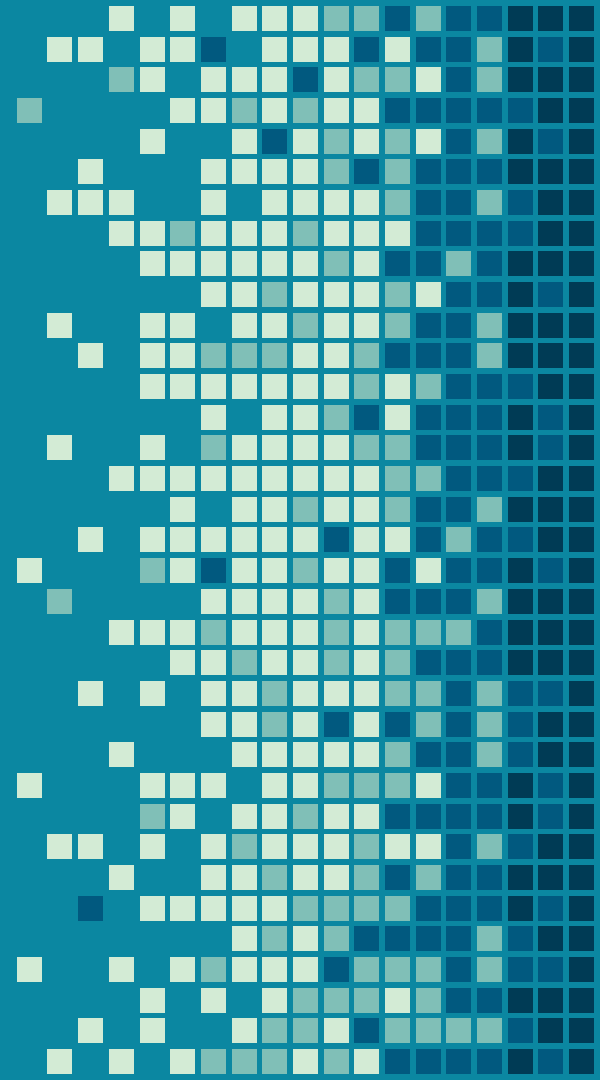
# Parental sensitivity



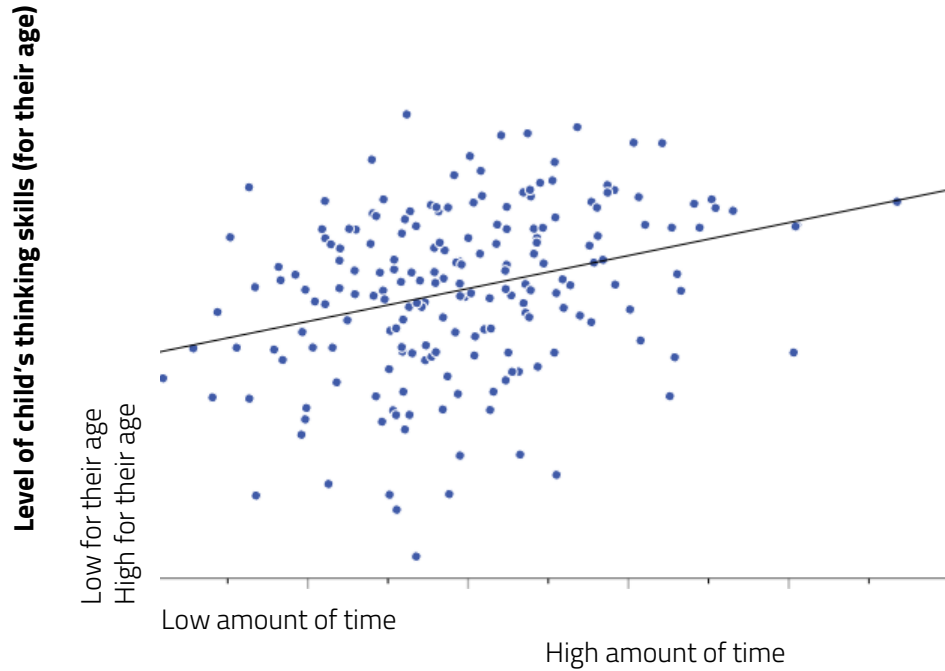




# Executive Functions

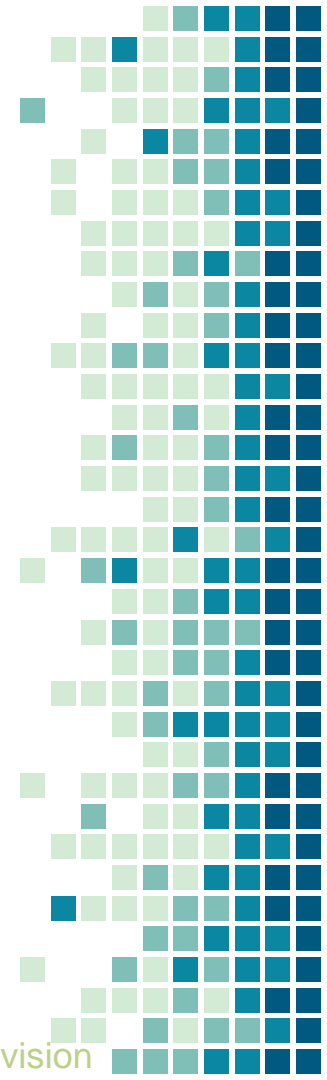


Children whose parents spent lots of time playing, talking and singing with them tended to show the strongest thinking skills



$$\beta = .309, p < .001, R^2 = .096$$

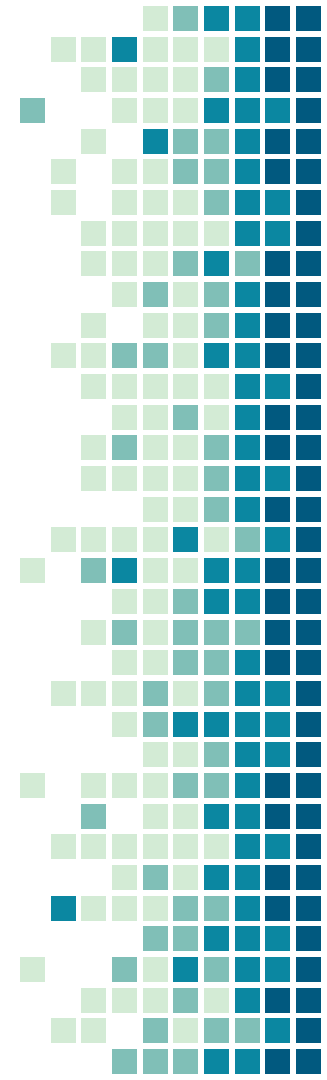
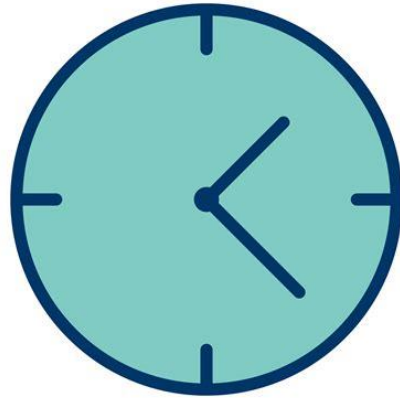
**Time parents reported spent engaging in activities with their child**



# Do some activities make more of a difference than others?



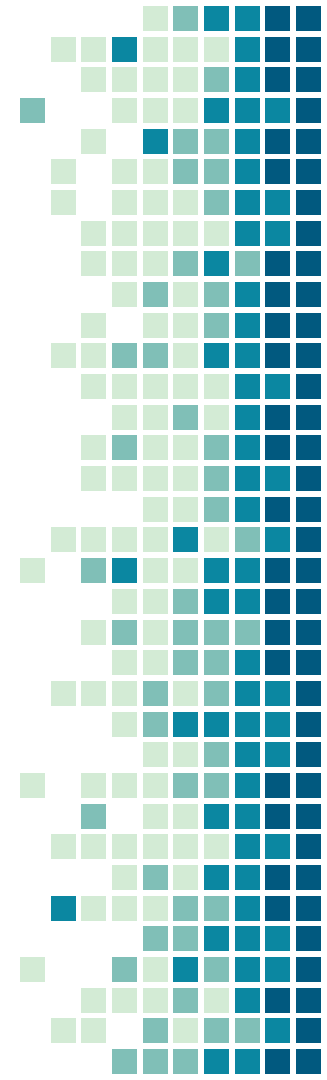
How much time is 'lots of time'?



# Parent-child activities



# Workshops for parents

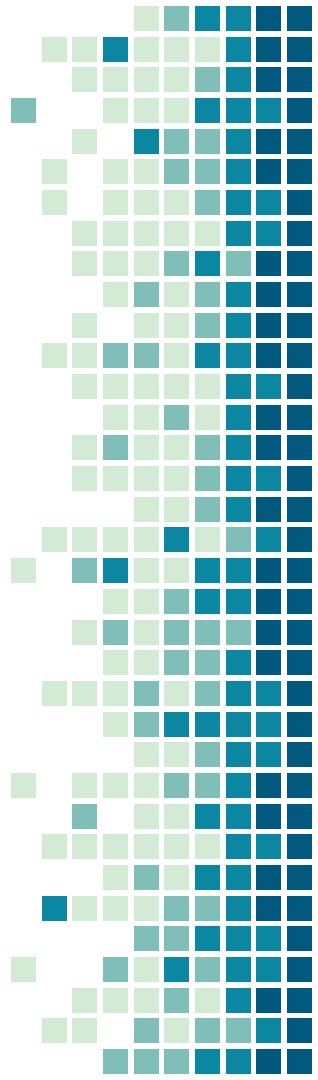




Share your experiences. What tips do you have for engaging in enriching activities?  
What barriers do parents face?

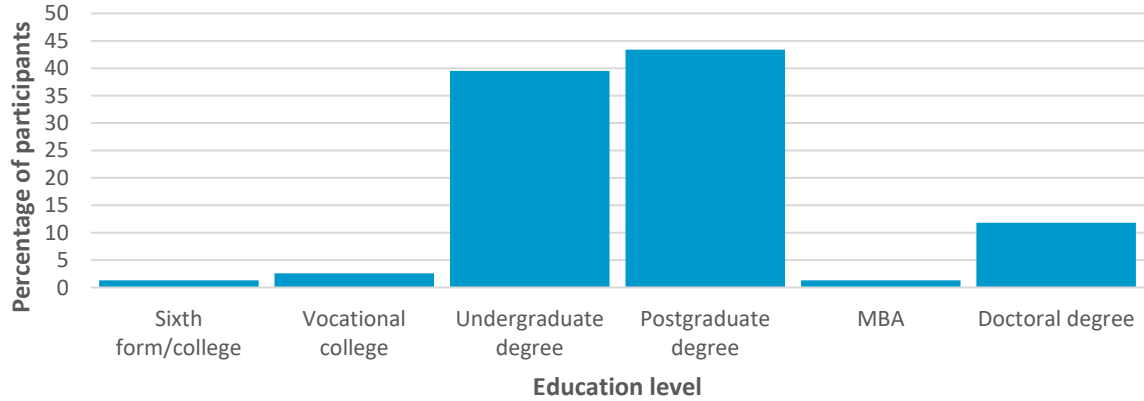
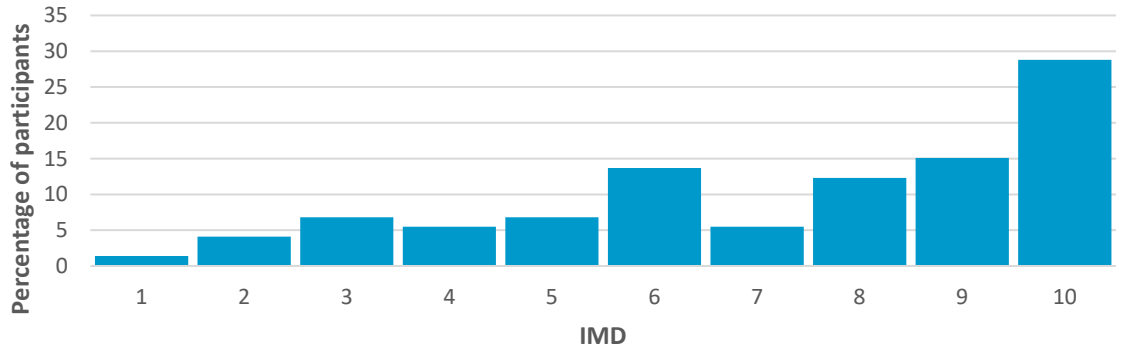


Breakout rooms 10 minutes



# Barriers to engaging in enriching activities

118 parents from a range of backgrounds





PRACTICALITY	RESOURCES	SAFETY & HEALTH CONCERNS	CULTURE & LANGUAGE	CHILD ABILITY, INTEREST & PERSONALITY	INTEREST AND PERSONAL PREFERENCE	IDEAS, KNOWLEDGE & EXPECTATIONS	PARENTAL WELLBEING
Time	Access to facilities	Risk of injury / harm / illness	English is an additional language	Child interest / attention span	Boring / not enjoyable for parent	Lack of ideas	Parent mood / mental health
Mess / Damage	Access to resources		Concerns re appropriate-ness	Child age/ ability	Prefer child-led activities	Lack of confidence	Too tired / too much effort
Multiple children	Space			Child's ability to follow instructions	Parent personality	Lack of understanding/ knowledge	Physical disability/ health
Effort/hassle	Cost			Child gets angry / fussy		Lack of skill	
Takes longer if child involved	Transport			Active child			
Weather							
Distractions							
Covid constraints							
Child getting dirty/wet							

PRACTICALITY

Time

Barrier to: Reading, Arts and crafts, Gardening, Household chores, Cooking and baking, Indoor exercise, Organised play, Free play

Mess /  
Damage

Barrier to: Arts and crafts, Gardening, Household chores, Organised play, and Reading

Multiple  
children

Barrier to: Organised play, Reading, Cooking and baking, Outdoor exercise, Household chores

Effort/hassle

Takes longer  
if child  
involved

Weather

Distractions

Covid  
constraints

Child getting  
dirty/wet

Sometime it takes a very long time, it is difficult to move on to a different activity or to do things we 'need to' like get dressed or leave the house

It's difficult to involve my toddler as my oldest daughter and baby all seem to want to do other activities at the same time so ... the opportunity is missed

RESOURCES

Access to facilities

Barrier to: Reading, Singing, Organised play

Access to resources

Barrier to: Reading, Gardening, Arts and crafts, Organised and Free play

Space

Barrier to: Arts and crafts, Cooking and baking, Indoor and Outdoor exercise, Gardening and Reading

Cost

Transport

The library being closed and particularly the groups not running has been a huge barrier.

Unsafe garden, currently trying to get it suitable but that requires time and money

SAFETY &  
HEALTH  
CONCERNS

Risk of injury /  
harm / illness

Barrier to: Gardening, Cooking & baking, Household chores, Indoor & outdoor exercise, Non-active time outside, Arts and crafts, Free play

I worry a lot about her putting the wrong things in the mouth - e.g. sharp knife, mud, pen, playdoh.

CULTURE &  
LANGUAGE

English is an  
additional  
language

Concerns re  
appropriate-  
ness

Barrier to: Reading, Talking

try to source books in my  
native language - they are  
not always that good or i  
don't know how to find the  
good ones

when i record videos to show  
my family i wouldn't speak in  
the video - because i worry  
about being judged as  
speaking English and not my  
mother tongue

I speak a different  
language to that of the  
country I live in so in public  
I tend to feel the need to  
be more discreet

CHILD ABILITY,  
INTEREST &  
PERSONALITY

Barrier to: Reading, Organised play, Cooking and baking, Free play, Singing

Child interest / attention span

Barrier to: Cooking & baking, Organised play, Indoor & Outdoor exercise, Arts & crafts, Gardening, Household chores

Child age/ ability

Child's ability to follow instructions

Child gets angry / fussy

Active child

My child is not interested in being read to

My son only lasts a few minutes doing it, he then gets up to do something else. It takes longer to set it up than the time that he spends playing with it

INTEREST AND  
PERSONAL  
PREFERENCE

Boring / not  
enjoyable for  
parent

Prefer child-  
led activities

Parent  
personality

Barrier to: Free play, Reading, Gardening, Arts and  
crafts, Indoor exercise, Singing, Talking

My toddlers want to play  
with a ball for ages but I  
can get bored

Never been particularly fond of  
gardening myself so haven't made the  
effort I probably should have to do  
gardening with him

I would love to be able to vary  
the books we read but we go  
through favourites where he  
wants the same book over  
and over again

IDEAS,  
KNOWLEDGE &  
EXPECATIONS

Barrier to: Organised play, Cooking & baking, Indoor exercise, Arts & crafts, Singing

Lack of ideas

Barrier to: Singing, Talking, Cooking & Baking, Indoor exercise

Lack of confidence

Lack of understanding/  
knowledge

Lack of skill

I run out of ideas of what to do

I was the younger of two siblings and have little experience of looking after children. I had my first child during lockdown and I struggled to know what to do.

I probably don't talk about topics that are useful to a baby like talking about colours and shapes!



PARENTAL WELLBEING

Barrier to: Organised play, Indoor & Outdoor exercise, Arts & crafts, Free Play, Talking

Parent mood / mental health

Barrier to: Organised play, Indoor & Outdoor exercise, Arts & crafts, Free Play, Talking

Too tired / too much effort

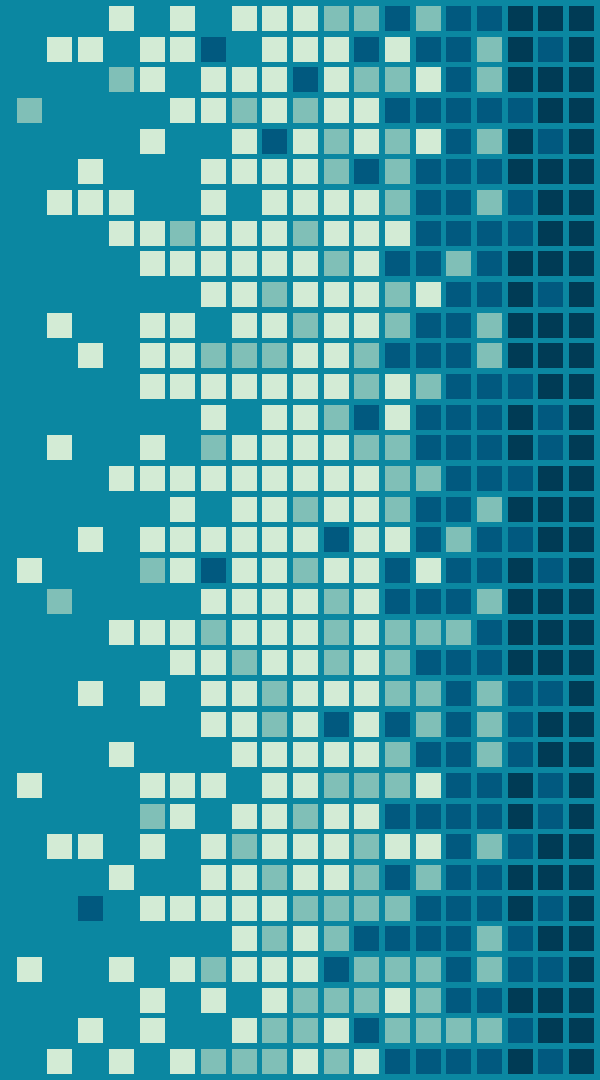
Physical disability/ health

I am too tired to research ideas about how to do organised play.

When I am tired or stressed I definitely go quiet and just sit and watch what he is going without even realising I am not engaging.



# Parental Mental Health



# Parental Mental Health

## Stress



## Anxiety



## Depression



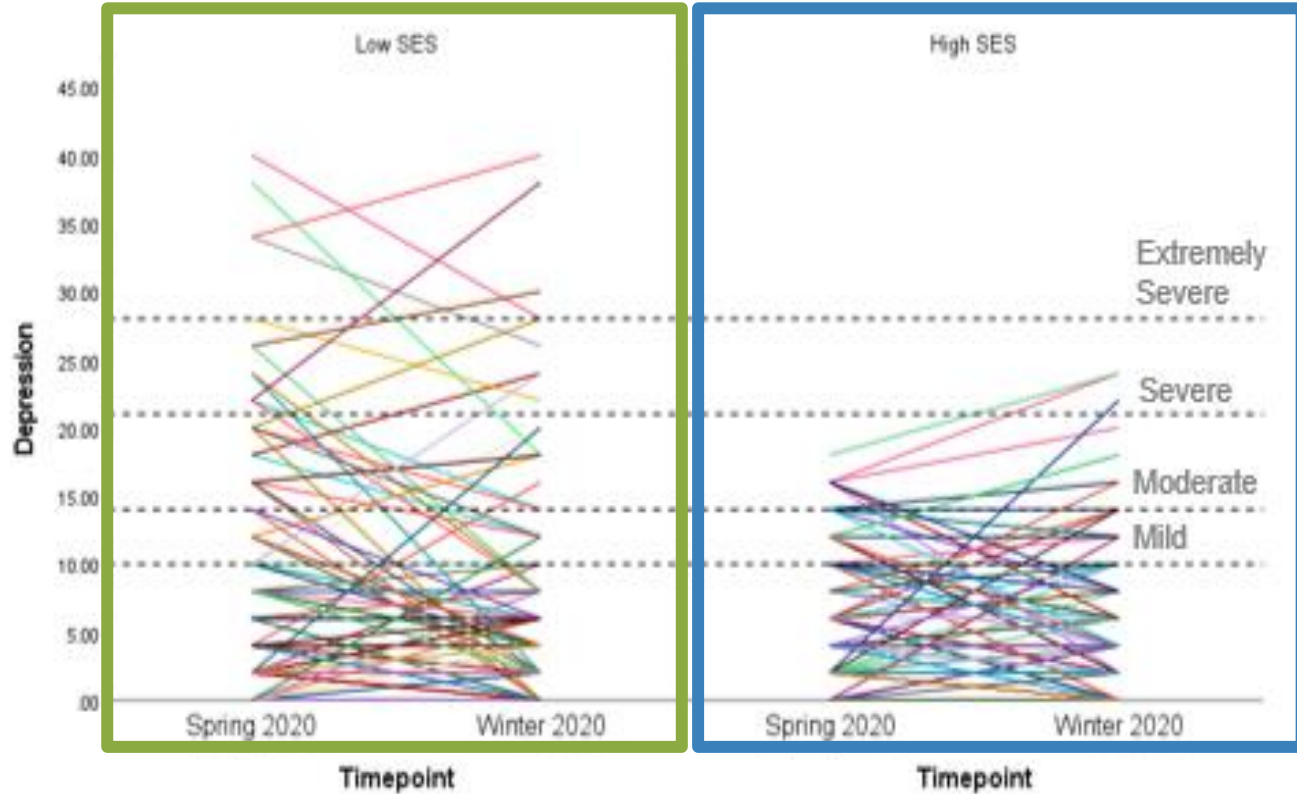
“...Sometimes it all gets on top of me... working plus childcare and I have down days as everyone does. They aren't often, but there is nowhere to go and no friends to see to help reduce stress. On these days I notice she seems more stropy, moody and cries more. I worry that is because she picks up on my stress and the impact that has on her.”

S

z, under review

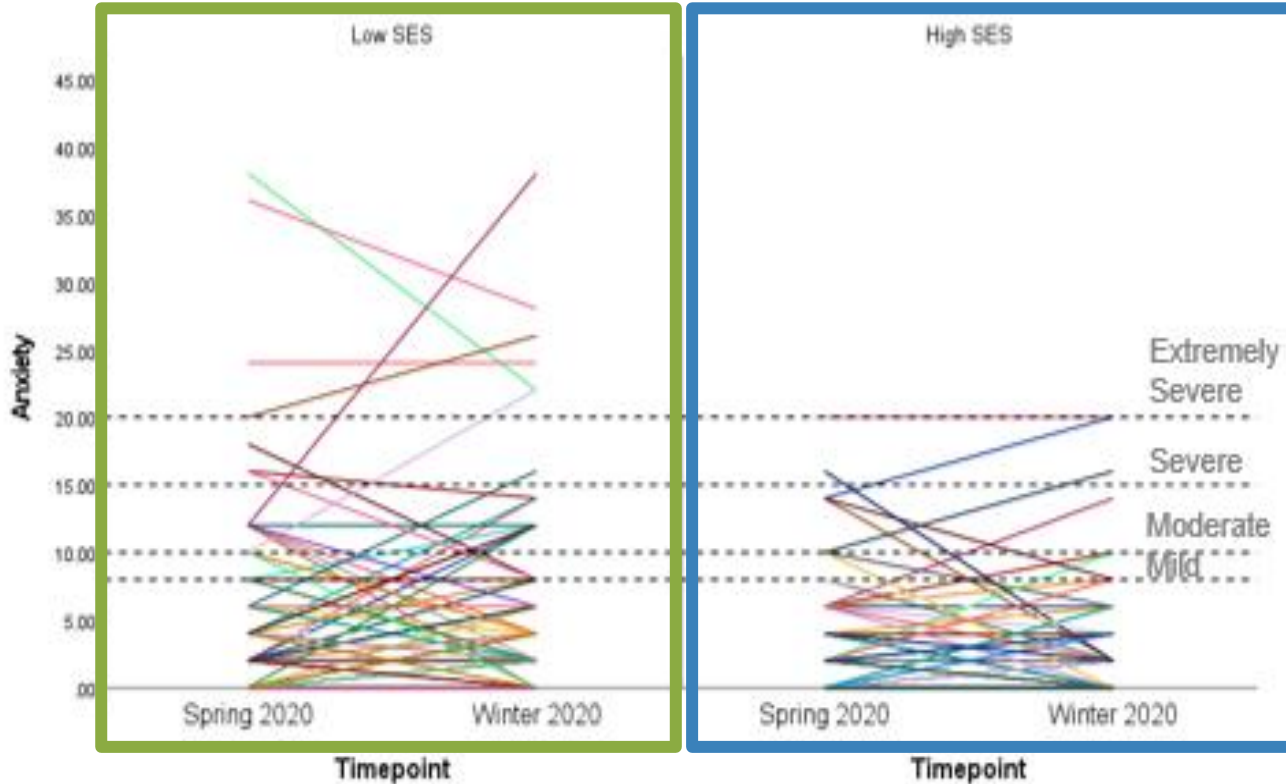
# Depression levels between lockdowns across SES

(a)

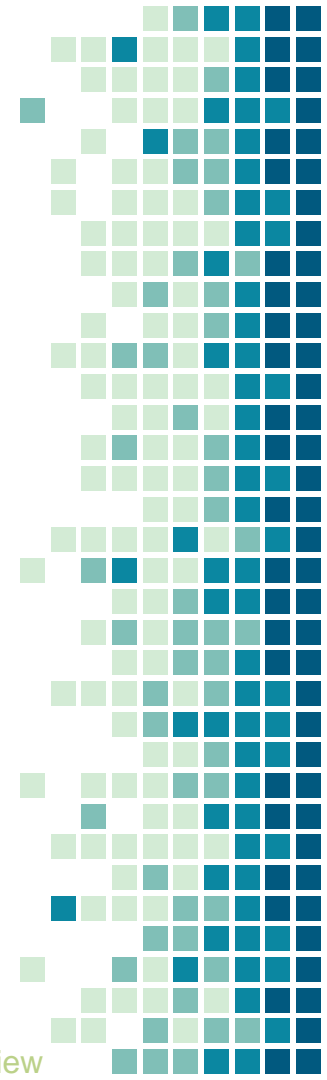
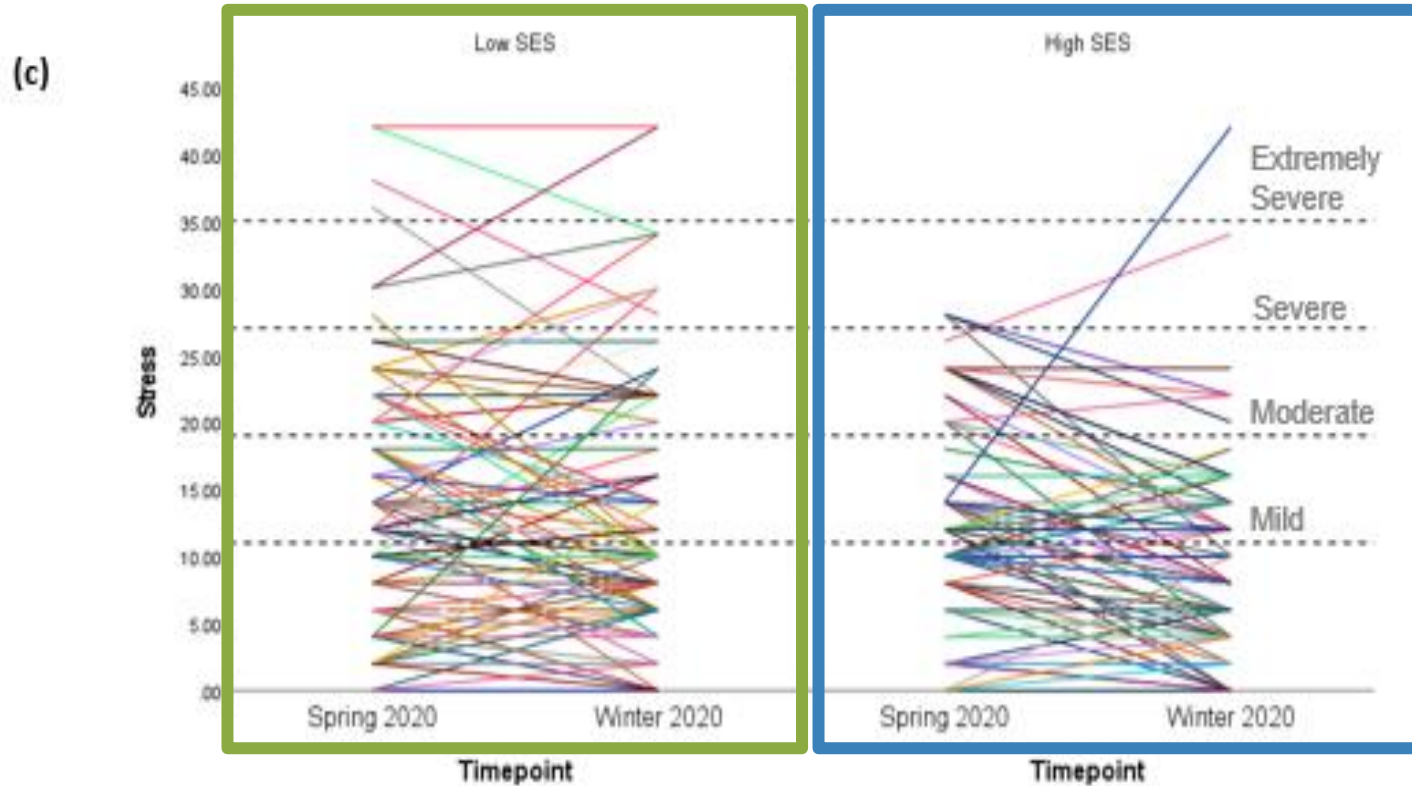


# Anxiety levels between lockdowns across SES

(b)



# Stress levels between lockdowns across SES

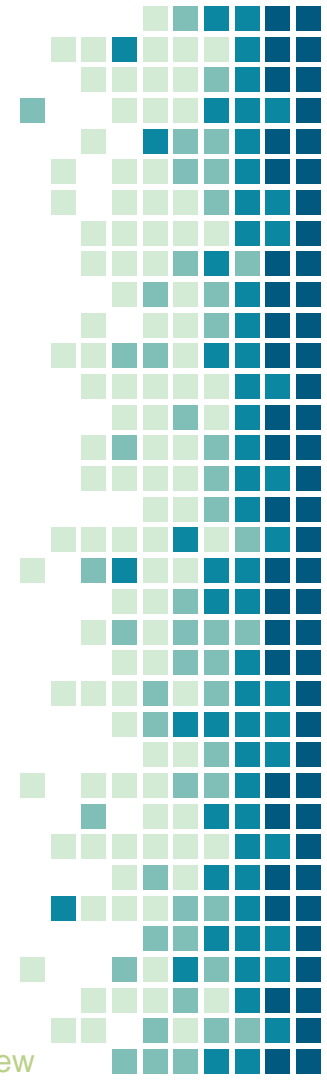


Spring 2020

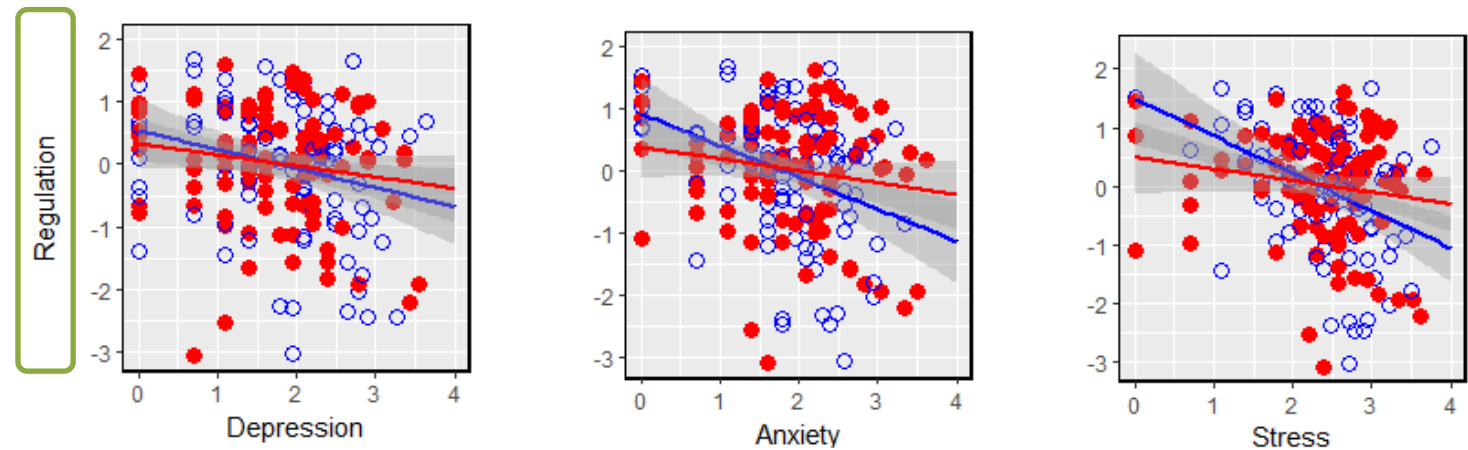
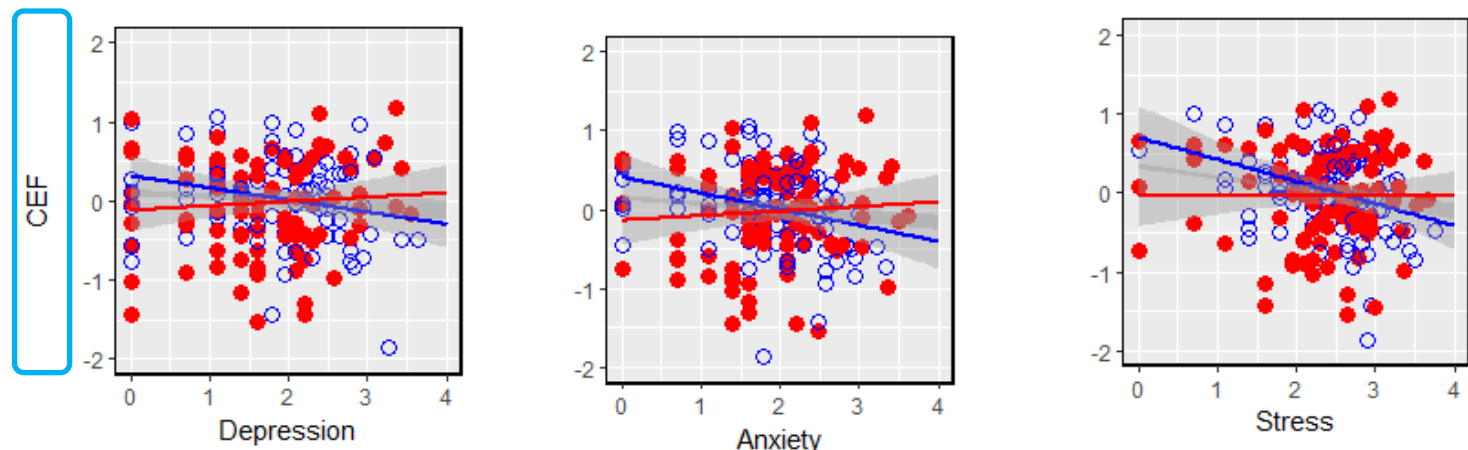
Across  
2020  
Pandemic





# Differences between boys and girls



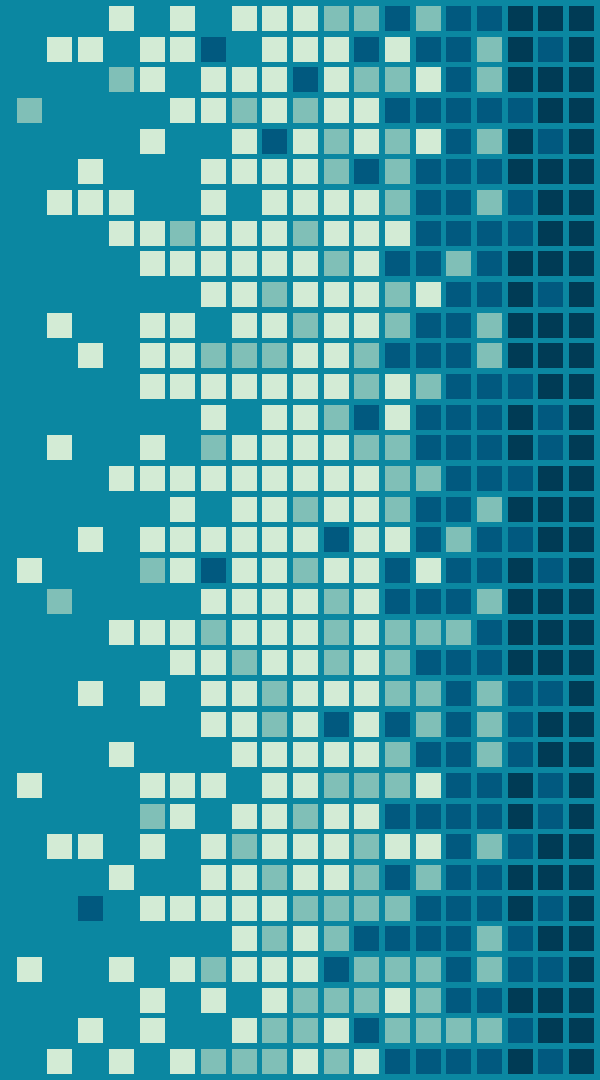




Sex  Male  Female



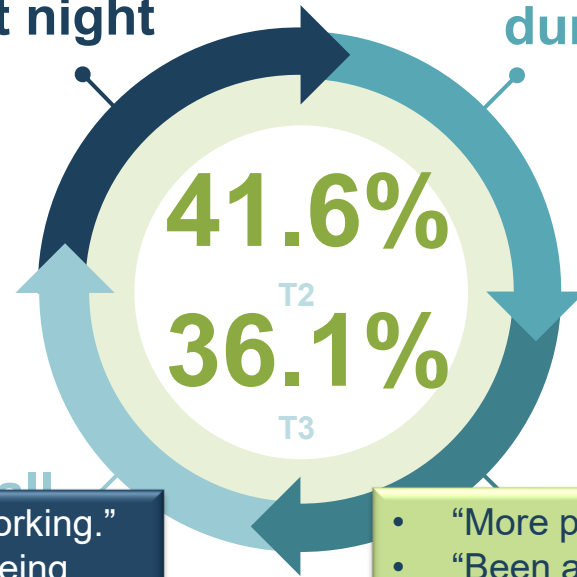
# Sleep



# Infants' Sleep During First Lockdown

Longer to fall asleep at night

Sleep less during day

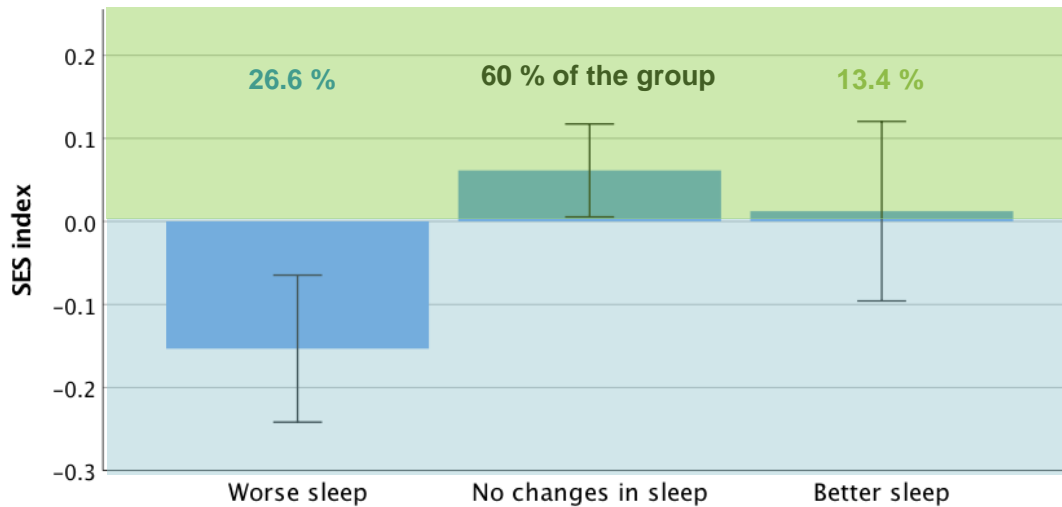


Longer to fall

- “Not as stimulated as we were working.”
- “Definitely unsettled about not seeing friends.”
- “More time with us has made her struggle when we leave the room at night.”

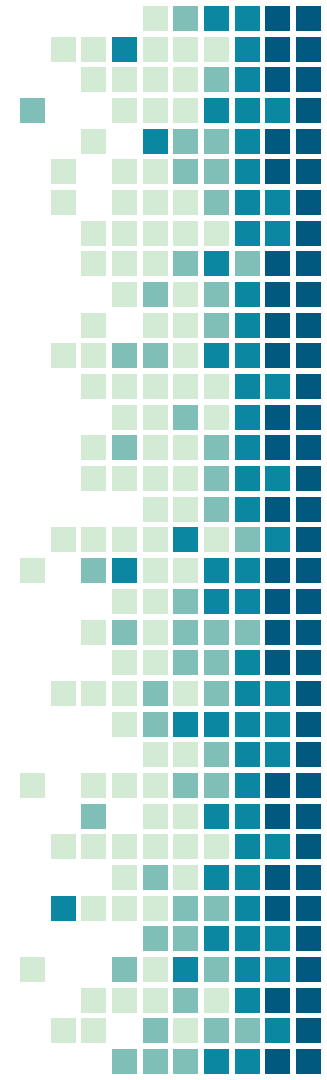
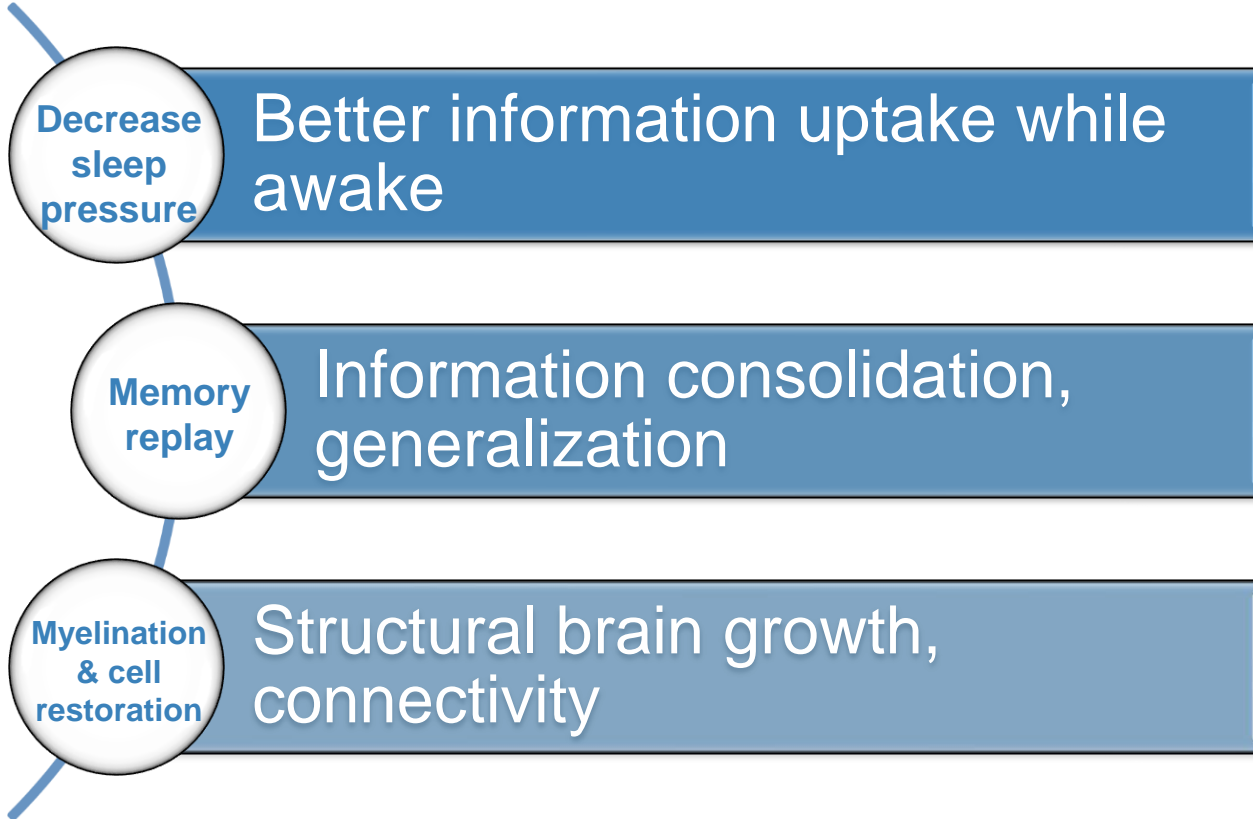
- “More physically tired from long walks / exercise”
- “Been able to establish daily routine that does not change due to working.”
- “Does not have to wake up for nursery so sleeps longer in the morning.”

# SES associated with changes in sleep Peri-Lockdown



Error Bars: +/- 1 SE

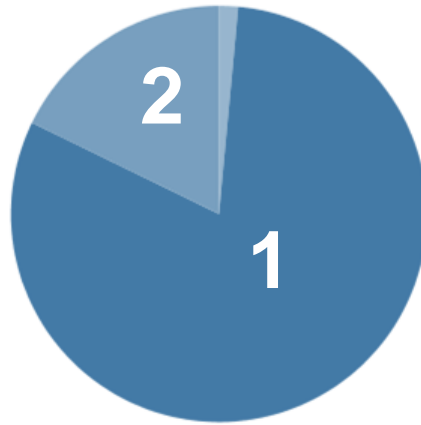
# Sleep and Cognitive Development



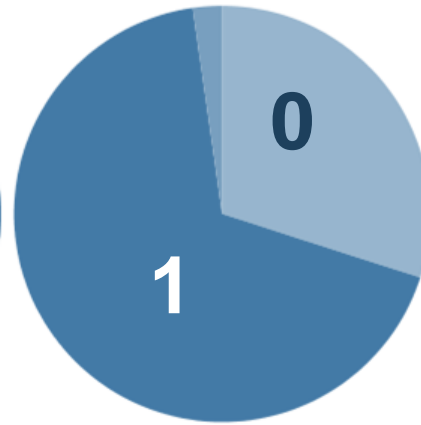
# Developmental change in the number of naps in our data



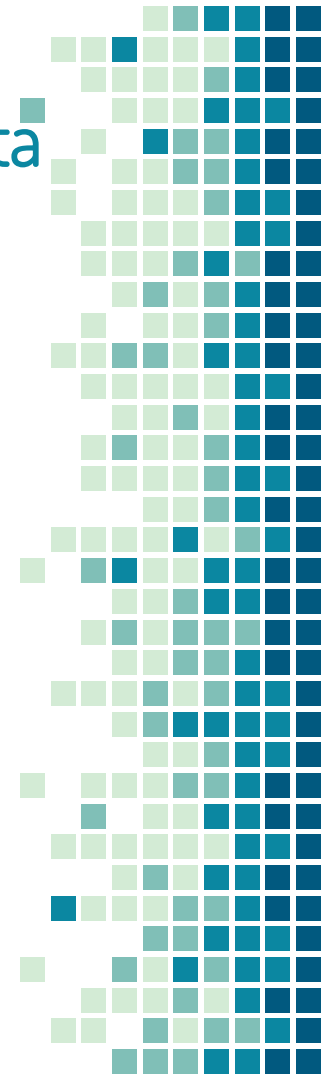
8-to-12-months



1-to-2-year-olds



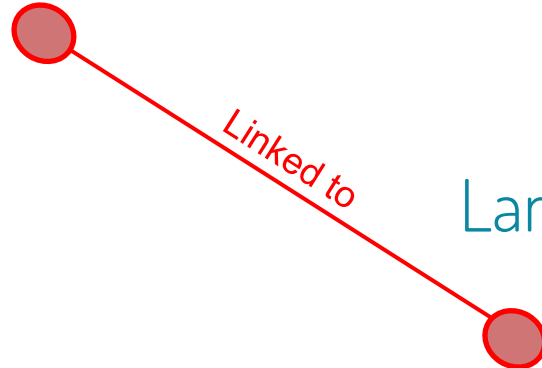
2-to-3-year-olds



Number of naps -



Length of day sleep +



Language Skills

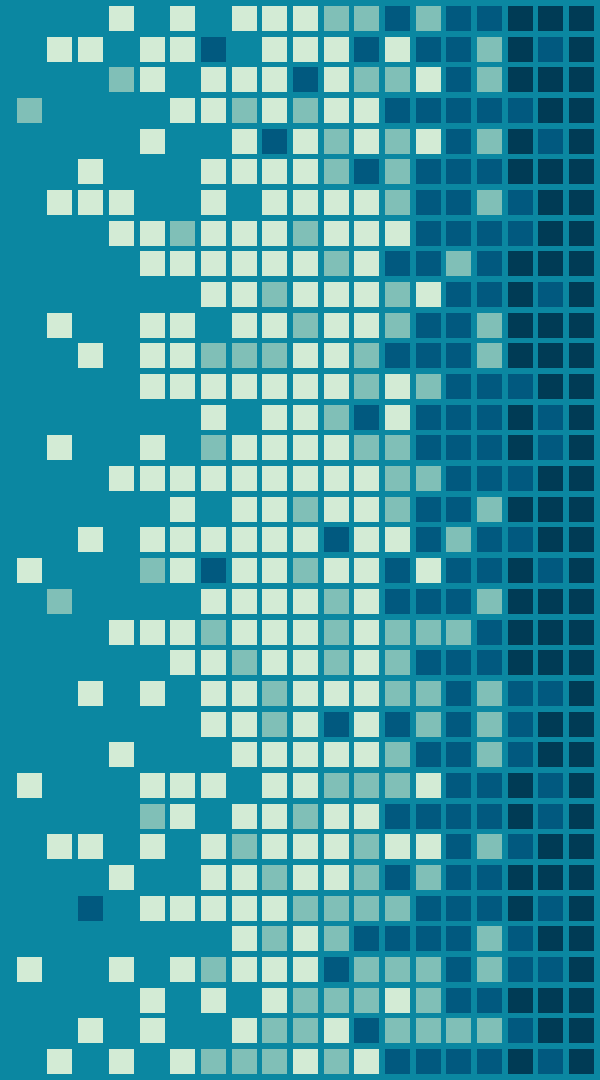


Thinking Skills



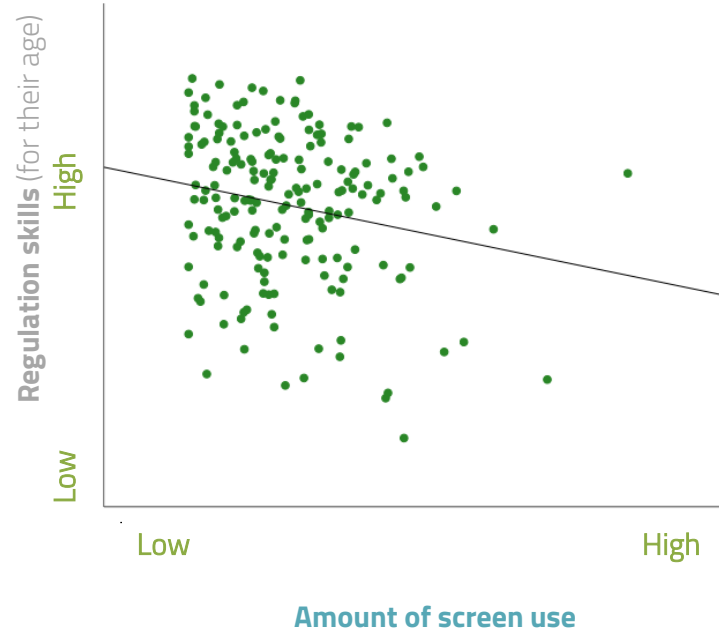
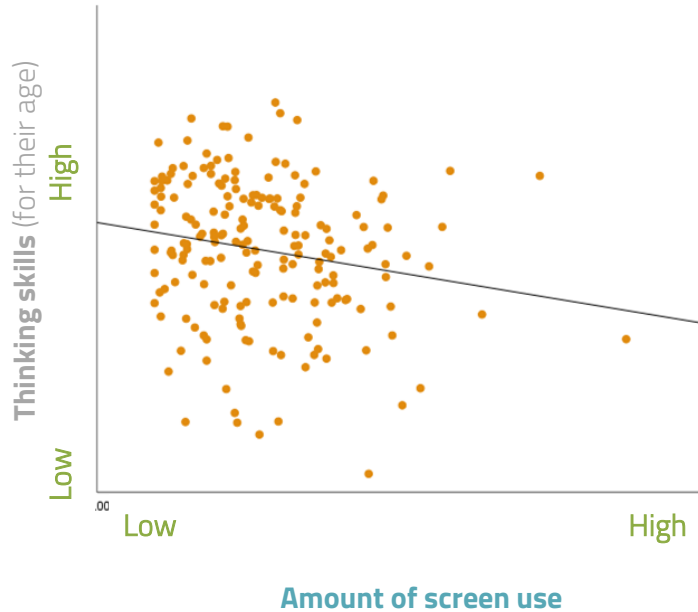


# Screen Use





Children who spent a lot of time using screens tended to have lower thinking skills and lower regulation skills



# Screen Use



## PROS

### Educational:

- can open up new worlds
- inspire the imagination
- introduce new words and ideas

Entertaining or calming

Gives parents a break / time to do other things

## CONS

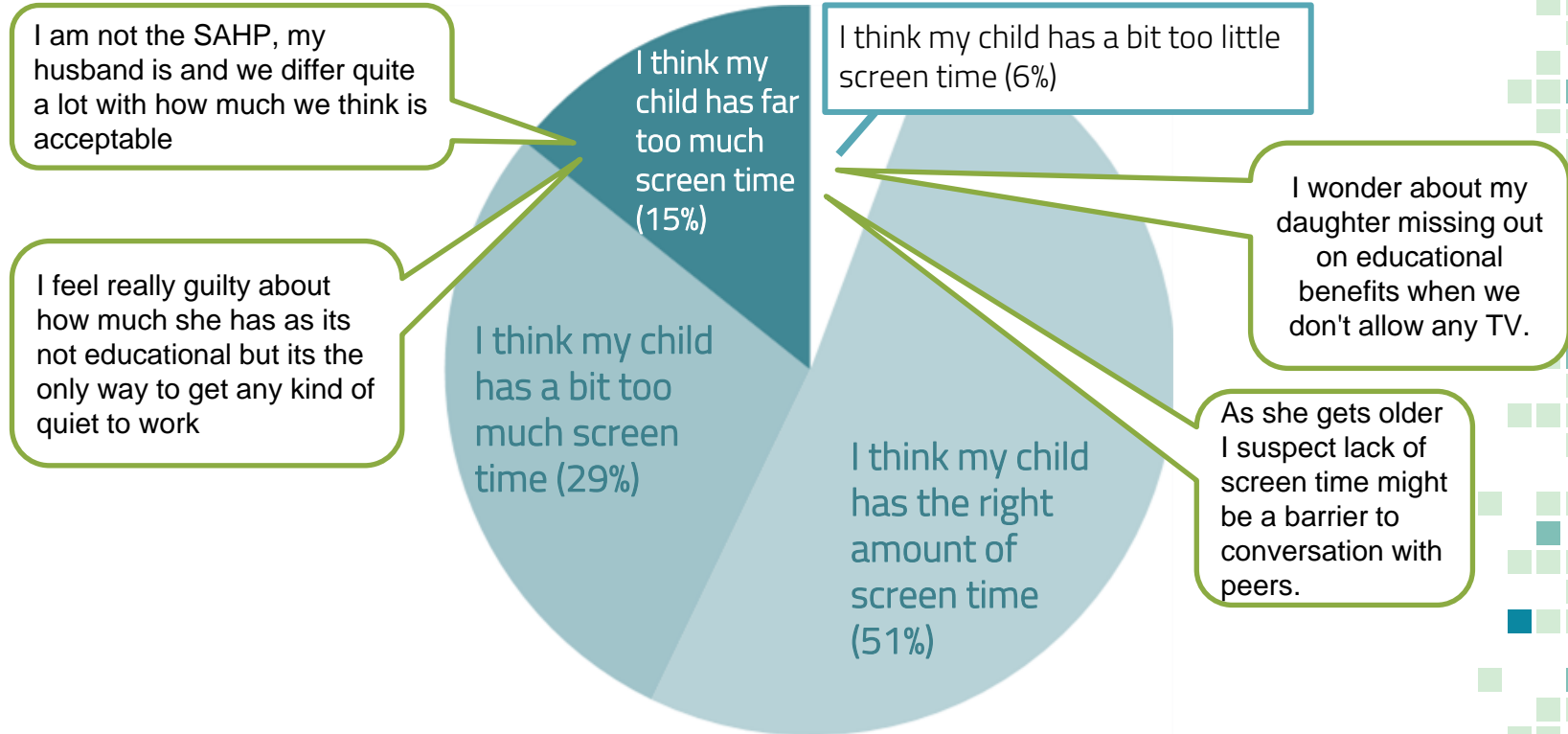
Harder to learn from screens than 3D objects

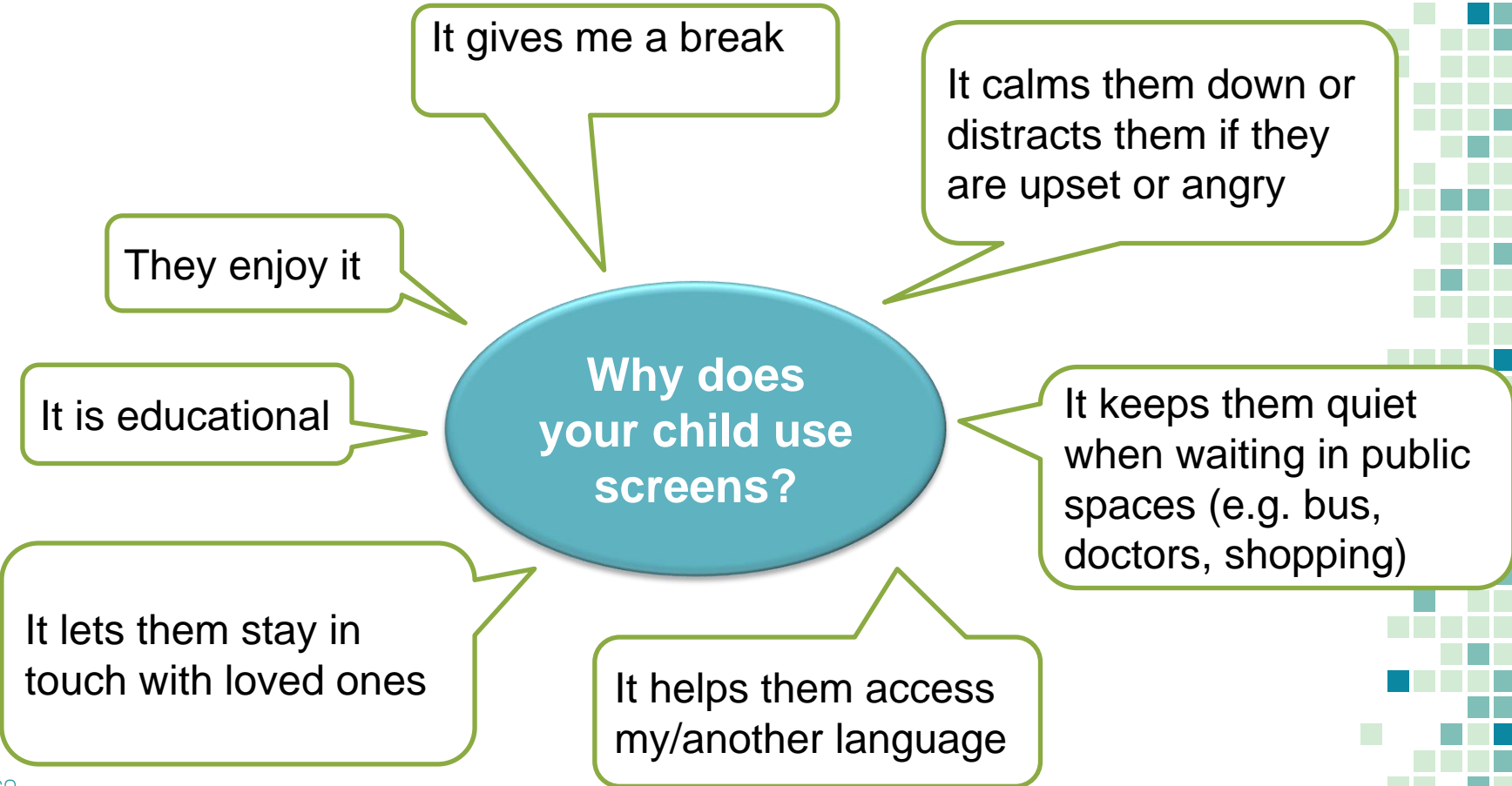
Constant background TV may hold back developing attention and language skills

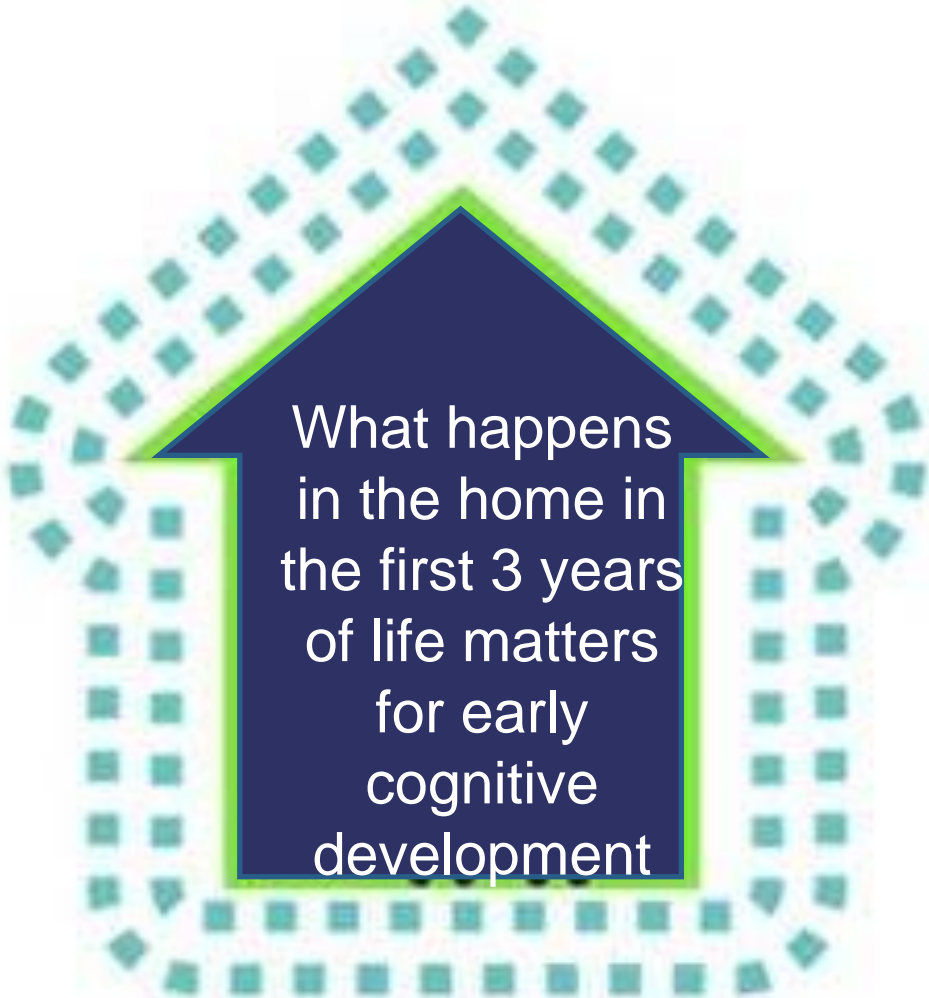
Can limit opportunities for toddlers to develop self-regulation skills

Can take time away from more energetic activities

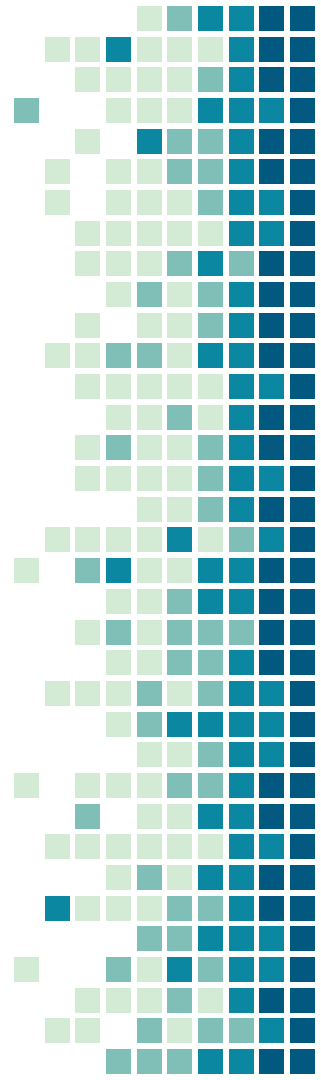
# Parents' feelings about screen time







What happens  
in the home in  
the first 3 years  
of life matters  
for early  
cognitive  
development





## Breakout rooms 20 minutes

Idea 1	
What the idea is	
Resources needed	
How/who it helps	

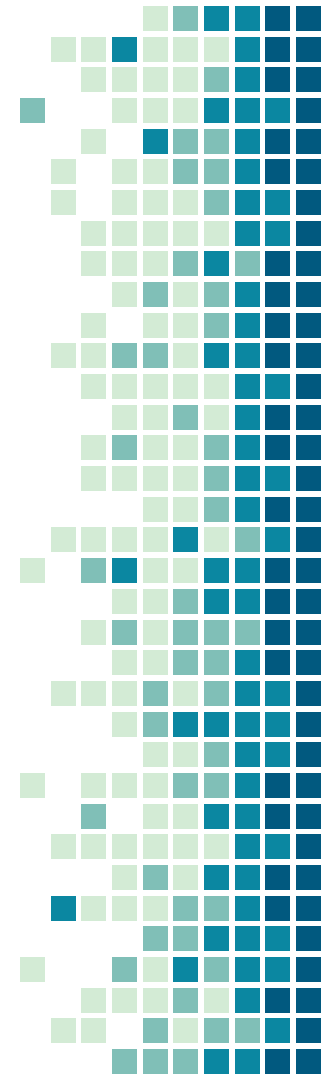




# ECEC Language & EF

# Social gradients in ECEC access

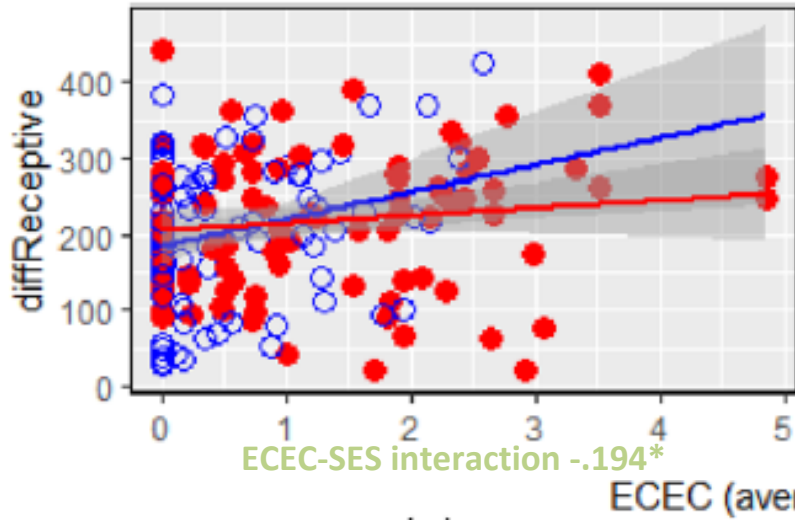
	<b>Lower SES: M (SD)</b>	<b>Higher SES: M (SD)</b>
ECEC prior to Spring Lockdown (days per week)	.78 (1.08)	1.69 (1.72)
ECEC during 2020 pandemic	.51 (.69)	1.28 (1.16)



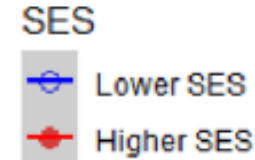
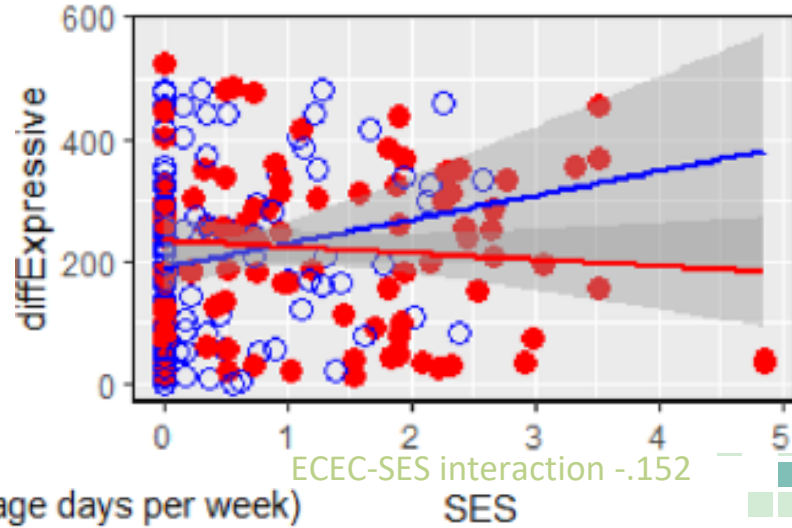


# Difference scores by ECEC and SES

## Receptive Vocabulary

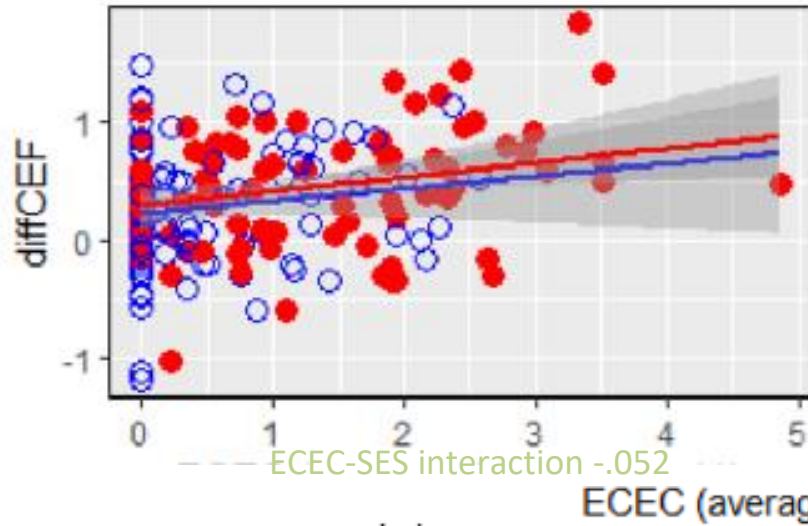


## Expressive Vocabulary

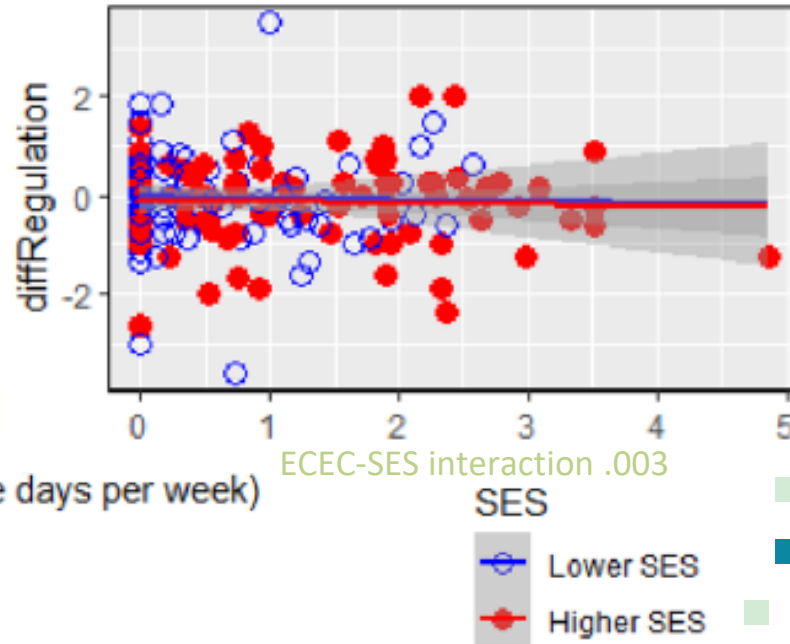


# Difference scores by ECEC and SES

## Thinking Skills

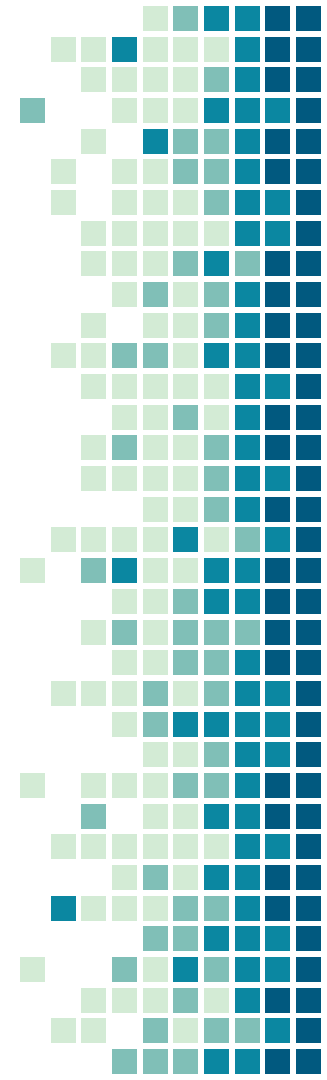


## Regulation Skills



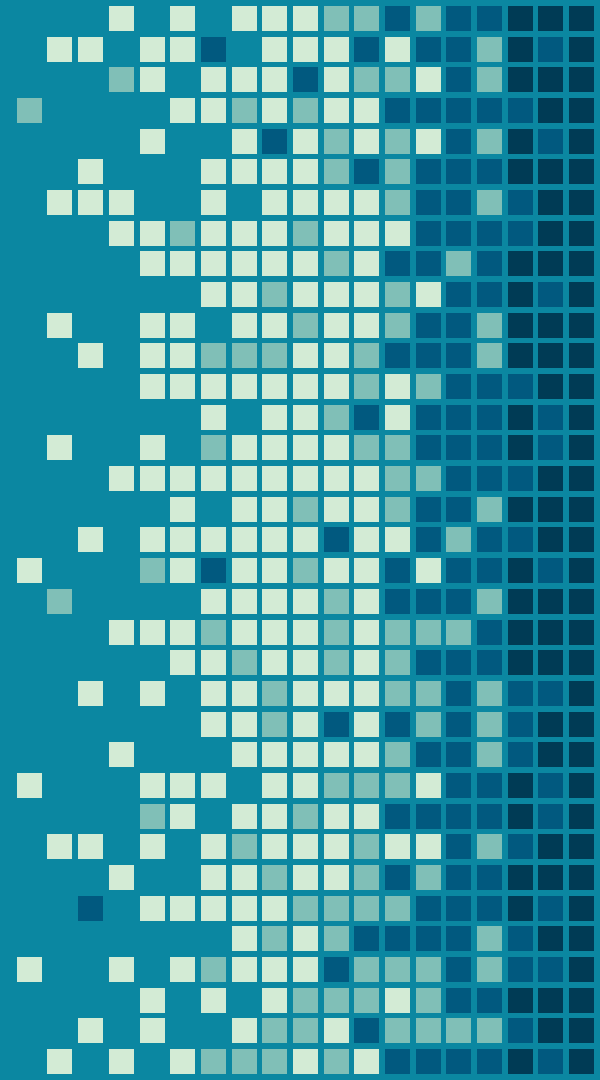


Attending  
ECEC matters  
for early  
cognitive  
development

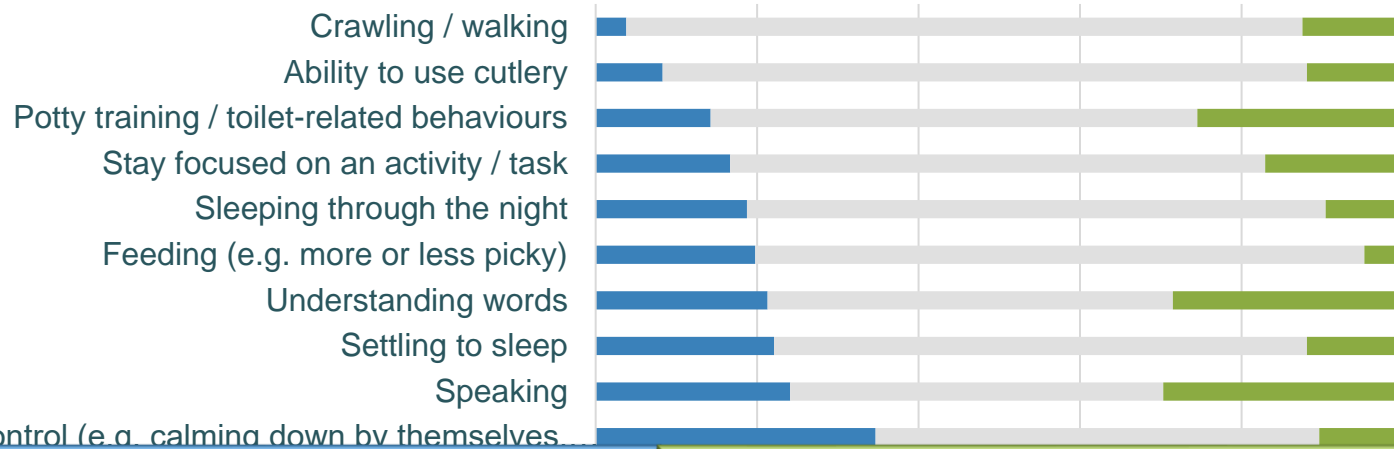




# Parental Perceptions on the Effects of Lockdown



# The effects of lockdown and Social Distancing on...



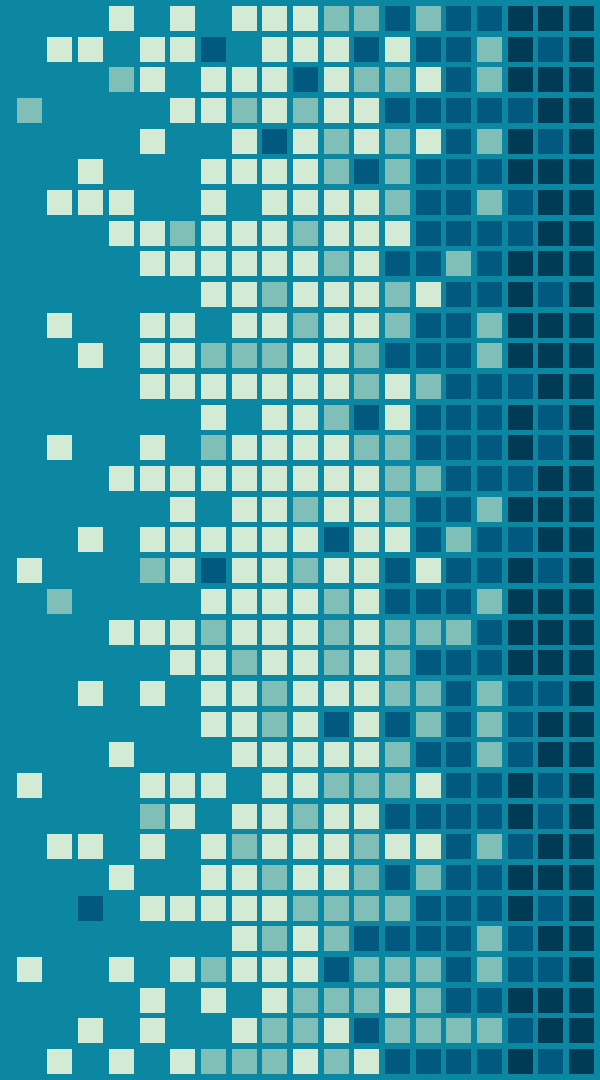
“Developed fear of strangers. Particularly men. If a man starts to try and talk to her she becomes incredibly scared, panic crying, hiding her face in me...”

“His emotional well-being has taken a huge hit. He cries much more frequently and has numerous tantrums each day. He smiles a lot less than before...”

“We were astonished by the improvement in our daughter’s mood, behaviour and development during lockdown. She is so much more settled than she was at nursery. Her language has improved extraordinarily in a way that a vocabulary test alone doesn’t show - the fluency of her speech and her use of grammar have improved to a remarkable degree simply from the fact she has had direct communication with an adult nearly all the time.”



# Summary & Discussion



# Summary & Discussion

## ■ Enriching Activities and SES

- Pre-Lockdown  Low and High SES
- Peri-Lockdown  Low and High SES

Outdoor space and Books access



DfE's surveys

# Summary & Discussion

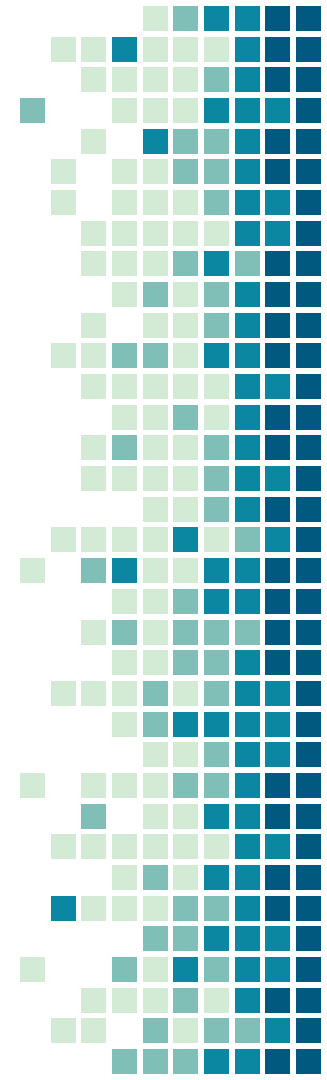


+ Language Growth ●



+ Enriching Activities

- Reading a book
- One-to-one speaking
- Arts and crafts
- Indoor exercise





# Summary & Discussion

- High early EF scores

were associated with:

— screen use +

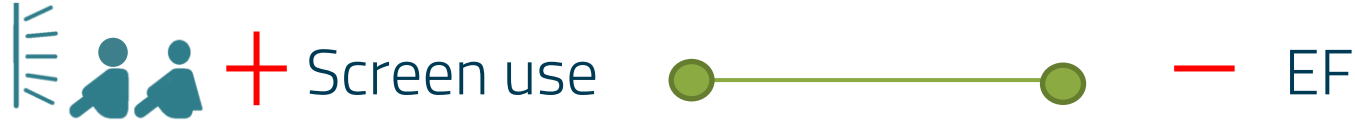
+ enriching activities with their parent —

Peri-Lockdown  
SES disadvantage

Poorer parent-reported EF



# Summary & Discussion



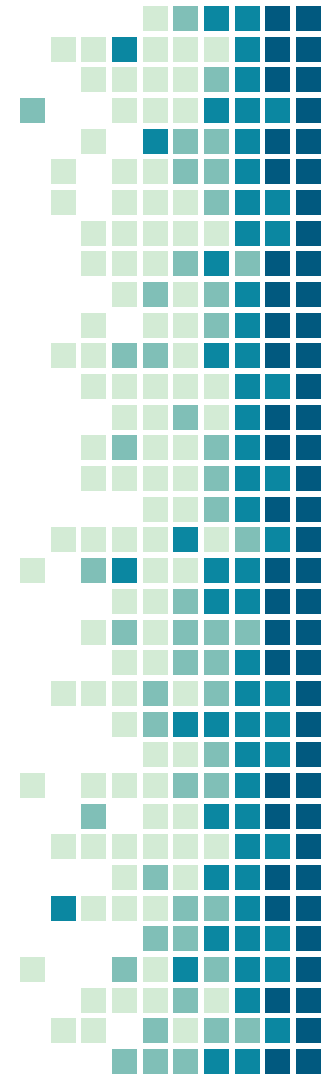
- disrupts sleep quality
- underdeveloped coping mechanisms

# Summary & Discussion



+ ECEC attendance:

- Language skills → Lower-SES +
- Thinking skills +

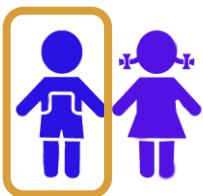


# Summary & Discussion



High levels of depression stress and anxiety among parents

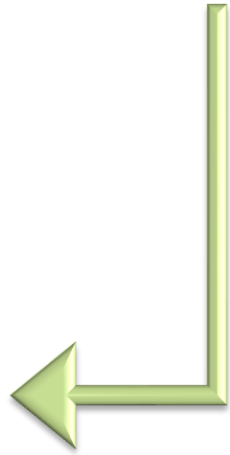
+ More disadvantaged parents



Regulation

~~Cognitive EF~~

~~Language Outcomes~~



DfE's surveys

Pierce et al. (2020)

Babies in Lockdown

SEED Study

# Summary & Discussion

Lockdown(s) &  
Social Distancing policies



Social Skills



Emotional Control



Practical Skills

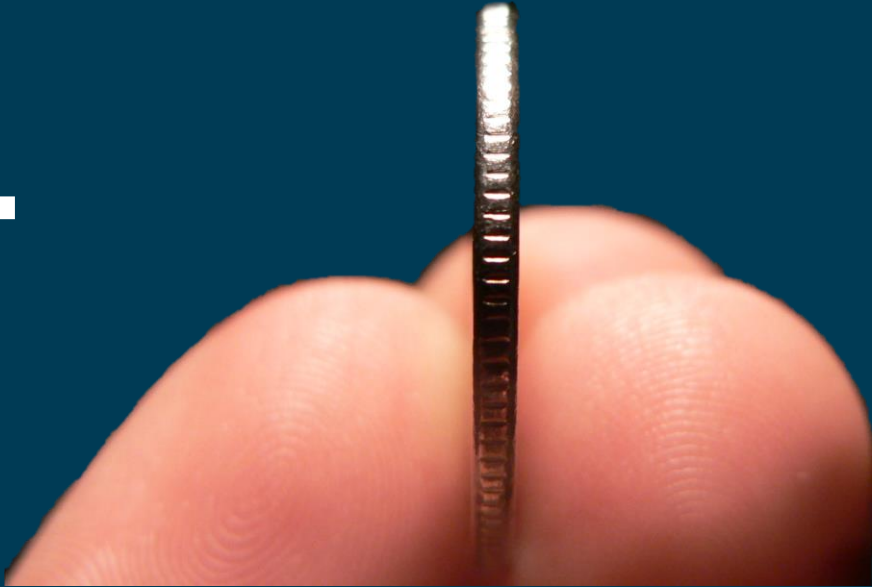
Babies in Lockdown

Ofsted EYs report

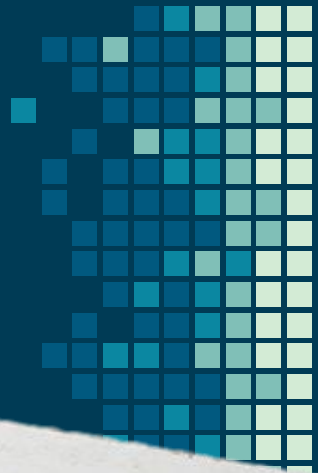
# Lockdown

+

-



**MIND THE GAP**

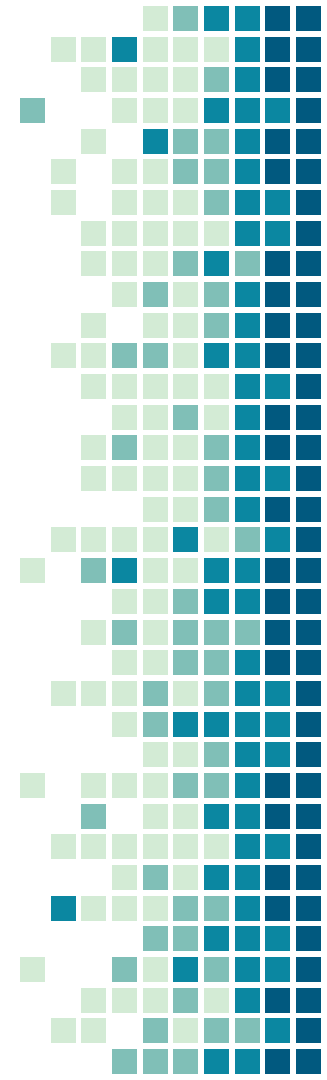


# How can we support parents to help their children to thrive?

**Inform  
parents**

**Reduce  
barriers**

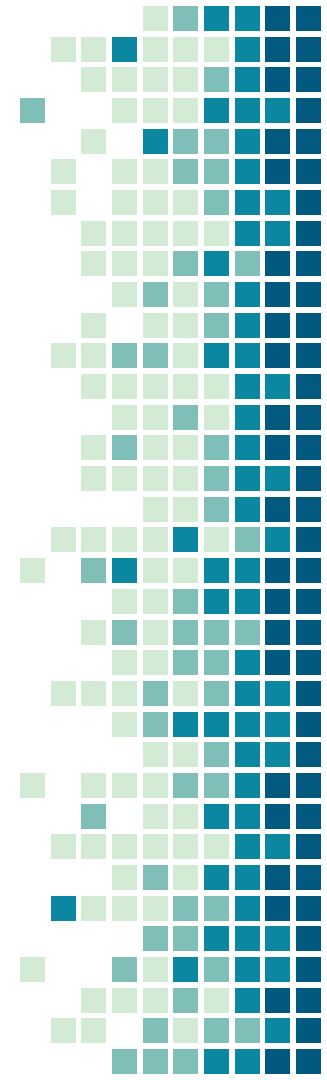
**Provide  
options**





# Recommendations

- Promoting and supporting family engagement in enriching activities.
  - Importance of enriching activities.
  - Risks high screen use
  - Access to communal resources
  - Paid parental leave



# Recommendations

- Encourage nursery attendance
  - High-quality education
    - Source of enriching activities
    - Enhance children's communication environments (Roulstone et al., 2011)
    - Improves children's cognitive and socio-emotional outcomes (Sylva et al., 2004).
  - Increase funding and encourage take-up

The logo for the SEED Study, featuring a grid of squares in various shades of blue and green, with a yellow banner across the middle containing the text "SEED Study".

SEED Study

# Recommendations

- Semiformal support networks (e.g., playgroups) actively encouraged and resourced.
  - Source of enriching activities
  - Promote child health
  - Links to formal support
  - Self-managed peer support

FaHCSIA, 2011

CFCA, 2016

# Recommendations

- Providing mental health support for parents.
  - Raising awareness
  - Providing advice
  - **Soft entry points**
  - Partnerships with mental health charities

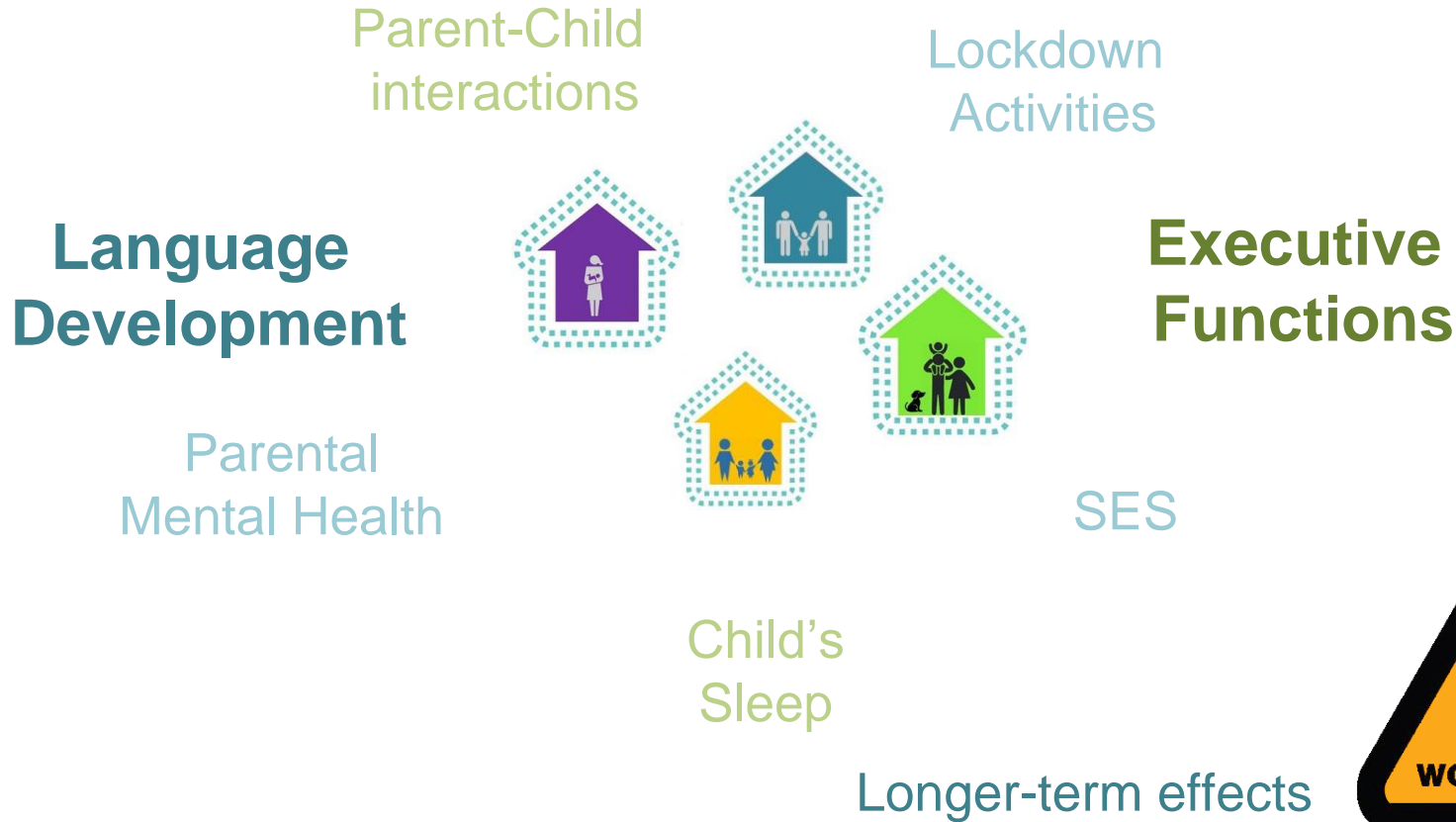
DfE's surveys

Pierce et al. (2020)

Babies in Lockdown

SEED Study

# Follow up



*Time 5– Spring 21  
Lockdown  
12 months after*

ASQ

SDQ

Social support

COVID-19 effects

Videos

Transcriptions

Scaffolding

Longer-term effects





Shannon Gibson

Catherine Davies  
Teodora Gliga  
Alexandra Hendry  
Michelle McGillion

UK Research and Innovation's rapid response to COVID-19  
(ES/V004085/1)

# Diolch yn fawr iawn!



Global Language  
Covid team

[ngonzalez-gomez@brookes.ac.uk](mailto:ngonzalez-gomez@brookes.ac.uk)

<https://babylab.brookes.ac.uk/research/social-distancing-and-development>

