



# EXECUTIVE FUNCTION IN PRESCHOOL DEAF AND HARD OF HEARING CHILDREN

*FCEI 2016 Bad Ischl*

Evelien Dirks

NSDSK

# EXECUTIVE FUNCTION



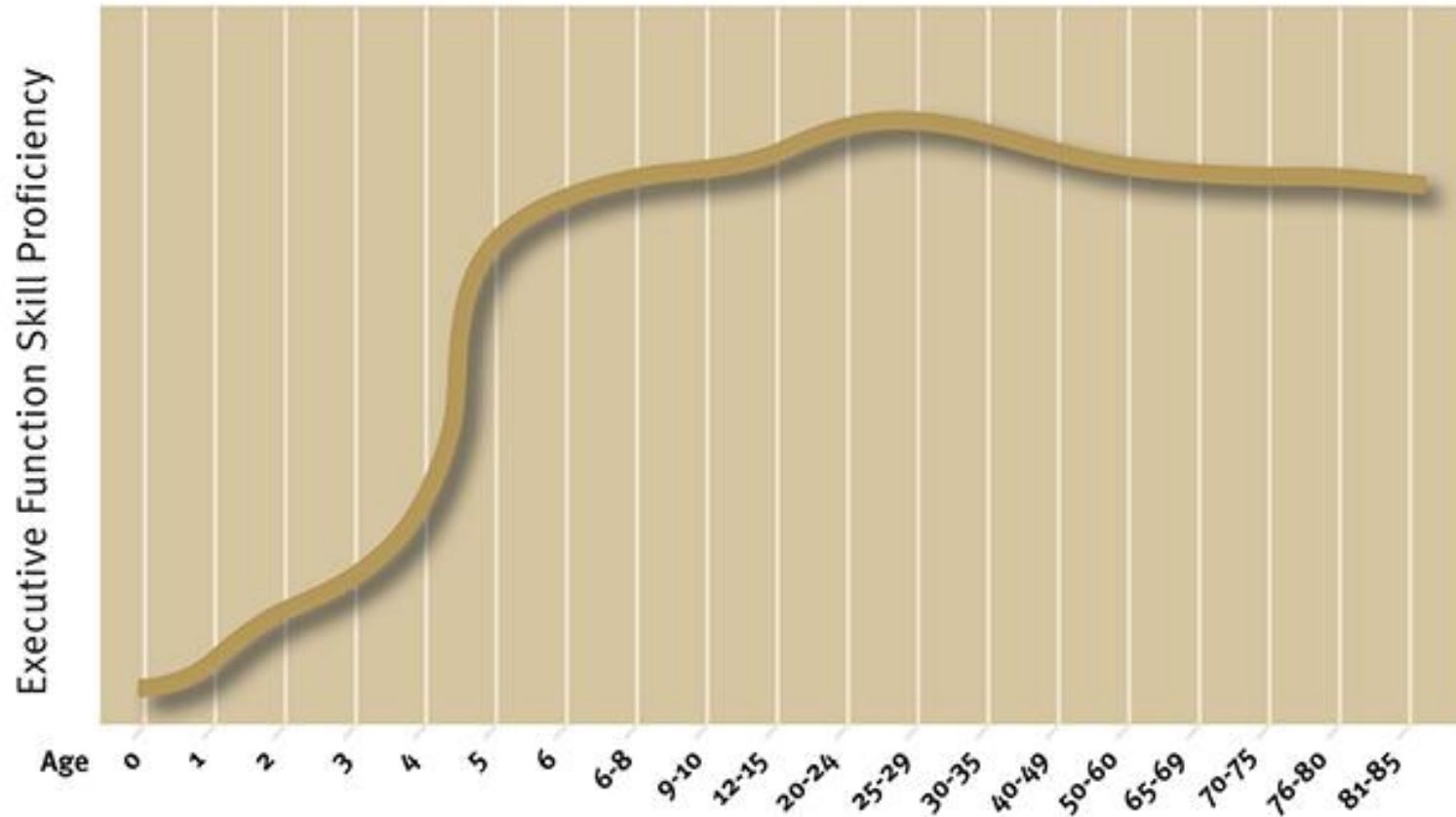
Executive function (EF) is an umbrella term for several higher order, self-regulatory functions such as:

- Working memory
- Inhibition
- Flexibility
- Planning

# EXAMPLE



## Executive Function Skills Build Into the Early Adult Years



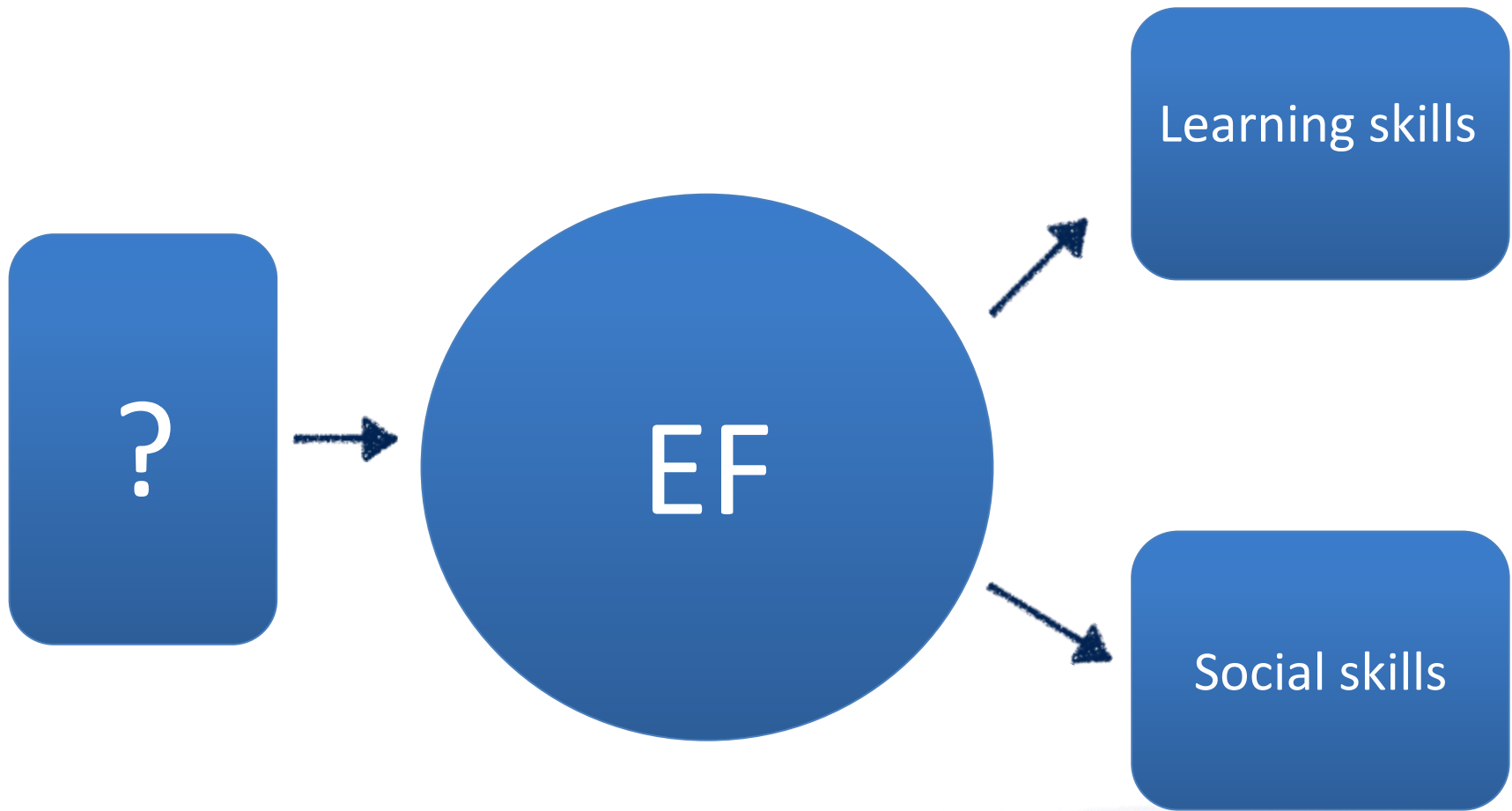
# RESEARCH IN YOUNG DHH CHILDREN

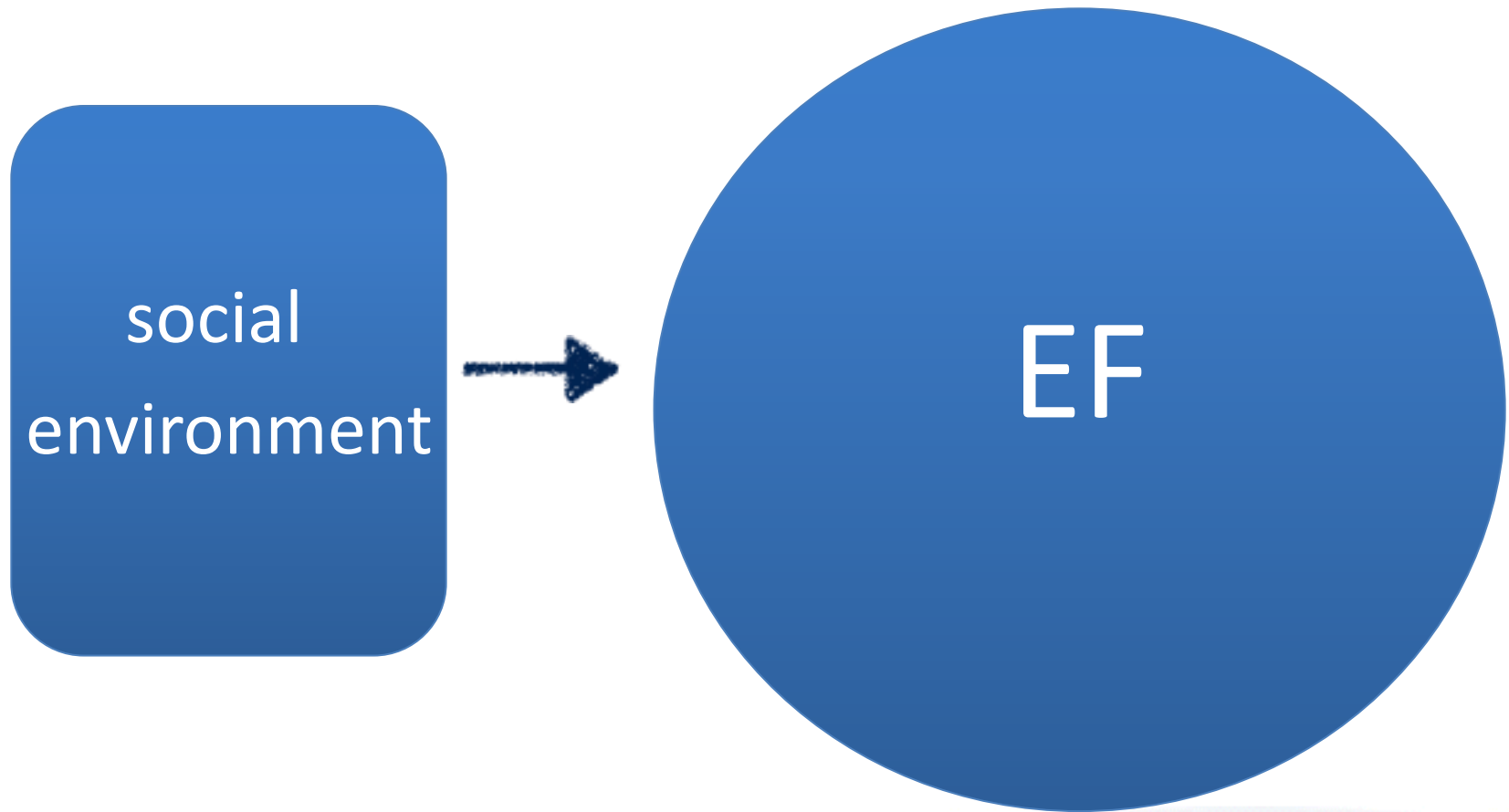
- Piskora e.a. (2010)
  - 46 pre-school children
  - Brief-P
- Holt e.a. (2013)
  - 20 pre-school CI children
  - Brief-P
  - Language ability
- Beer e.a. (2014)
  - 20 pre-school CI children
  - Brief-P
  - EF tasks
  - Language ability



# RESULTS EF IN YOUNG DHH CHILDREN

- Difficulties with:
  - Working memory
  - Inhibition
  - Flexibility
  - Emotion regulation
  - Planning
- Association working memory and language ability







# DEVELOPMENT OF EF

“use it or lose it”

- Prefrontal cortex
- Postnatal development
- Brain plasticity



# PARENTING AND EF

Carlson e.a. (2003)

3 dimensions:

- Scaffolding
- Sensitivity
- Mind-mindedness



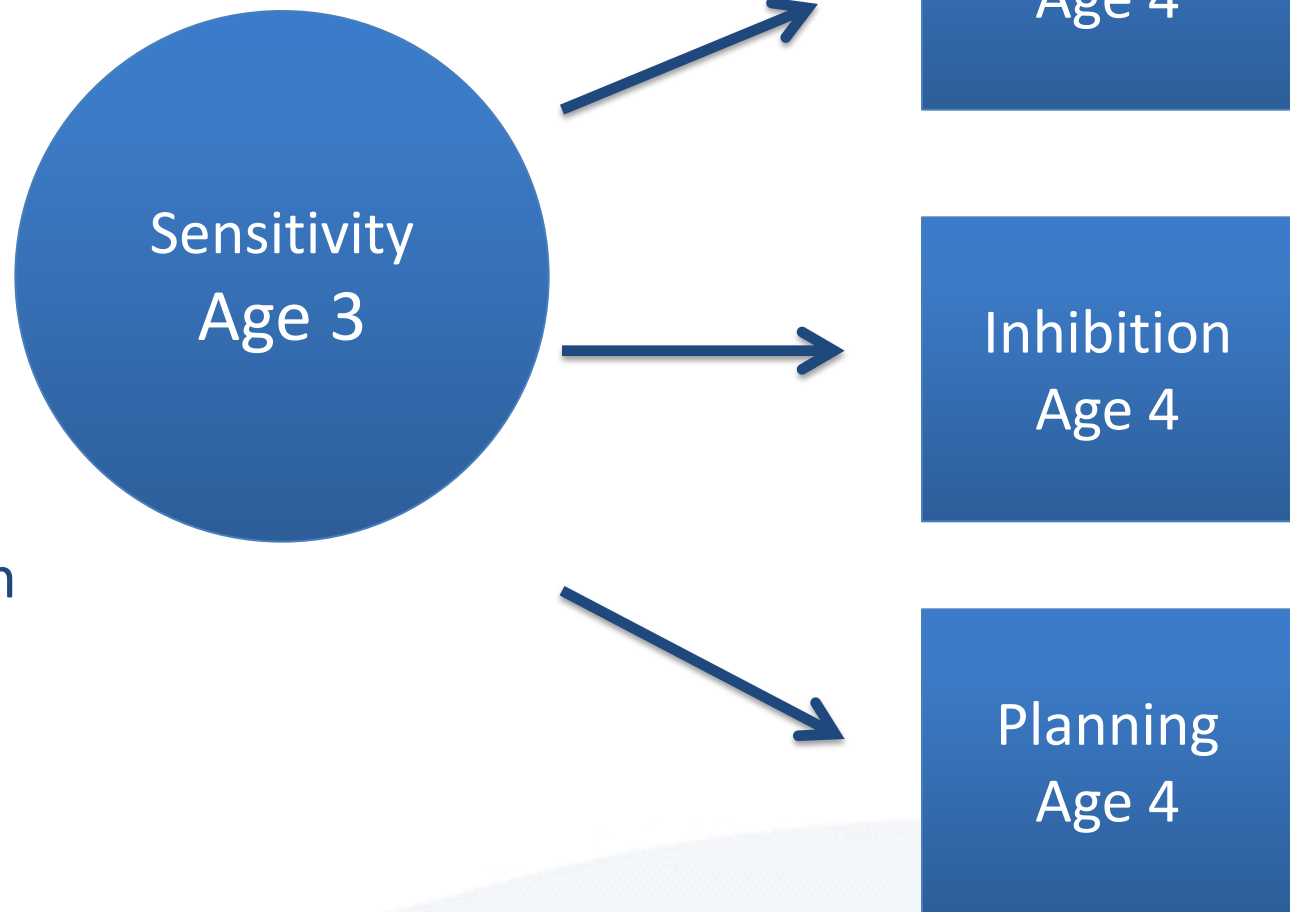
Related to working memory, inhibition, flexibility, and planning

# RESEARCH BERNIER E.A. (2010)

- Parent-child interaction (age 12 months)
  - Sensitivity
  - Mind-mindedness
  - Scaffolding
- EF Tasks at 18 mnd and 24 months
  - Working memory
  - Inhibition
  - Flexibility
- Results:

All parent related variables were predictive of EF

# GENERATION-R STUDY



- 544 children
- Sensitivity
- Brief-P

# PILOT STUDY



## *Participants*

- 20 toddlers with hearing loss (mean age 3;2 jaar)

## *Instruments*

- Brief-P
- Language ability
- Video of free play situation parent and child
  - Sensitivity (Emotional Availability Scales, Biringen 2008)
  - Mind-mindedness (Meins, 2015)

# BRIEF-P

## Behavior Rating Inventory of Executive Function - Preschool (Giola et al, 2000)

- 2-5 jaar year old
- 5 scales:
  - Working memory
  - Inhibition
  - Flexibility
  - Emotion regulation
  - Planning

### Working memory:

- Has a short attention span

### Inhibition:

- Interrupts others

### Flexibility:

- Becomes upset in new situations

### Emotion Regulation:

- Has explosive angry outbursts

### Planning

- Gets caught up in details

# SENSITIVITY

Emotional Availability Scales (Biringen, 2008)

The ability to “read” a child and to be emotionally and openly communicative with that child



# MIND-MINDEDNESS

Meins (2015)



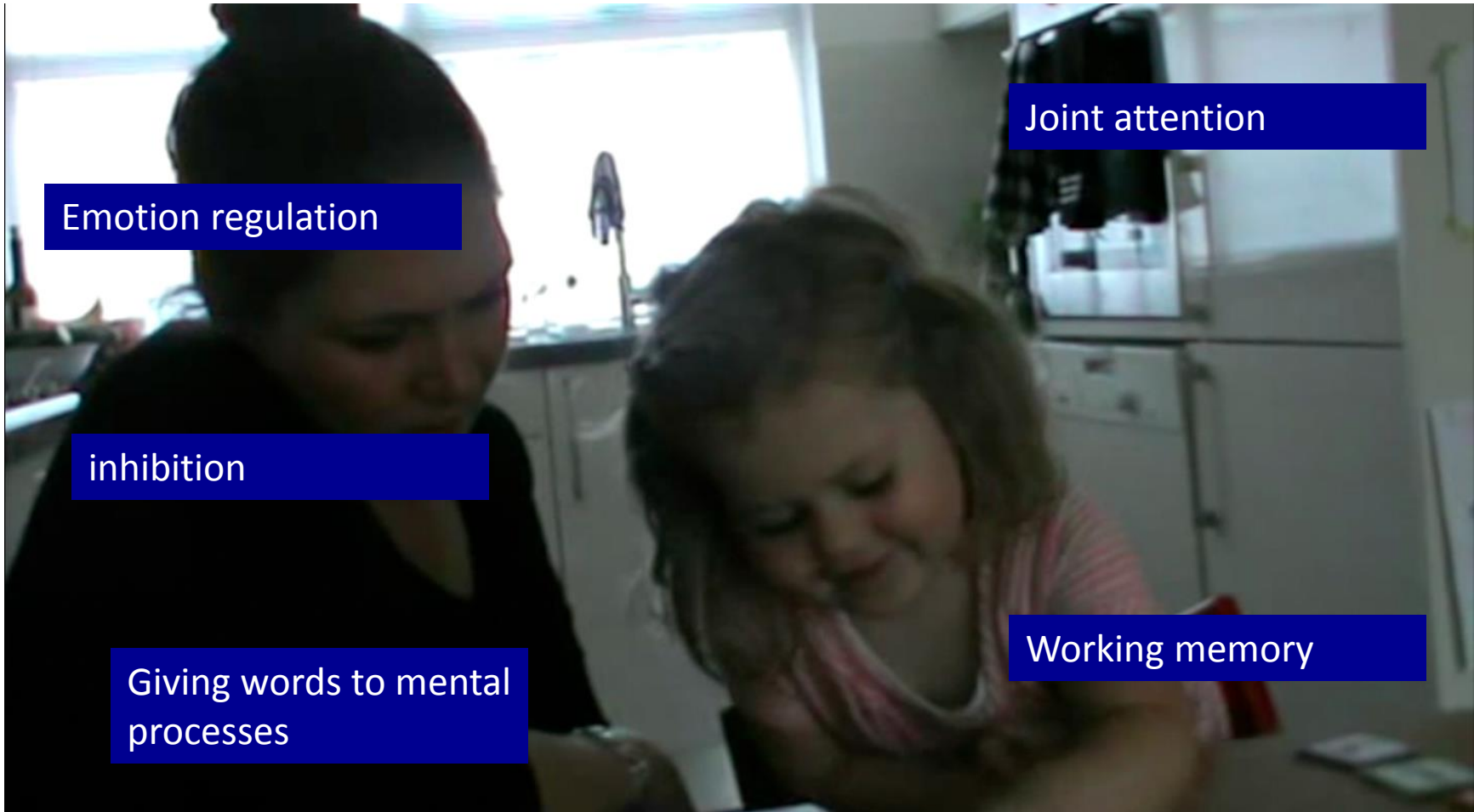
Parents ability or willingness to represent their children's likely thoughts and feelings

*Like, dislike, don't like, love, want, prefer, favourite, hate, can't stand  
decide, making a decision, know, recognise, remember, recall, realise, interested, not  
interested, notice, focused, intent, expect  
happy, sad, scared, afraid, joyful, gleeful, serious, grumpy, stressed, moody .....*



# VIDEO





Emotion regulation

inhibition

Giving words to mental processes

Joint attention

Working memory

# RESULTS EF

	Mean	% clinical DSH	% clinical norm
EF total	95	16	6
Inhibition	26	11	8
Flexibility	13	11	6
Emotion regulation	14	11	3
Working memory	26	26	9
Planning	15	16	5

# ASSOCIATIONS EF

	Sensitivity	MM	Receptive language	Expressive language
EF total	-.28	-.37	-.28	-.27
Inhibition	-.18	-.26	-.14	-.05
Flexibility	.06	-.34	.04	.07
Emotion regulation	-.02	-.28	-.07	.07
Working memory	-.44*	-.34	-.48*	-.43
Planning	-.17	-.33	-.24	-.31

# CONCLUSIONS PILOT

- DHH preschoolers more often difficulties concerning with EF, especially in working memory
- Associations between EF and:
  - Sensitivity
  - Receptive language

# FUTURE RESEARCH

- Expand pilot study (N=50)
- Parent based interventions



# ACTIVITIES

## 6-18 months

- Hiding games
- Lap games
- Songs
- Conversations
- Imitation games
- Simple role play

## 18-36 months

- Songs
- Active games
- Conversations
- Storytelling
- Matching/Sorting games
- Puzzles
- Imaginary play

## 3-5 year

- Songs
- Active games
- Conversations
- Storytelling
- Matching/Sorting games
- Puzzles
- Imaginary play
- Reading
- Cooking

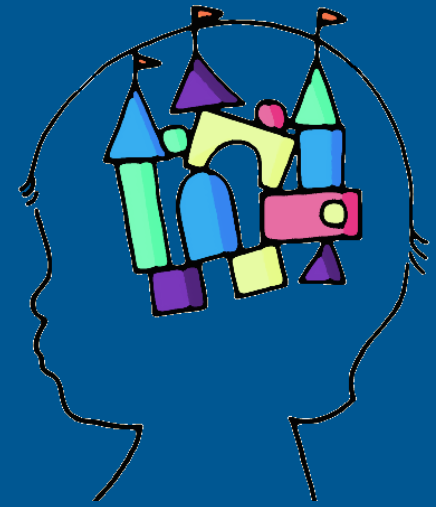


Enhancing and Practicing Executive Function Skills with Children from Infancy to Adolescence



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