EXECUTIVE FUNCTION IN PRESCHOOL DEAF AND HARD OF HEARING CHILDREN

FCEI 2016 Bad Ischl

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

- Working memory
- Inhibition
- Flexibility
- Planning
EXAMPLE

REPRESENT

PLAN

EXECUTE

EVALUATE
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
Social skills
Learning skills
Social skills
social environment → EF
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


- 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-MINEDNESS

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 ...............
Joint attention

Emotion regulation

inhibition

Giving words to mental processes

Working memory
## RESULTS EF

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>% clinical DSH</th>
<th>% clinical norm</th>
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<tbody>
<tr>
<td>EF total</td>
<td>95</td>
<td>16</td>
<td>6</td>
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<tr>
<td>Inhibition</td>
<td>26</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>Flexibility</td>
<td>13</td>
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<td>6</td>
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<tr>
<td>Emotion regulation</td>
<td>14</td>
<td>11</td>
<td>3</td>
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<tr>
<td>Working memory</td>
<td>26</td>
<td>26</td>
<td>9</td>
</tr>
<tr>
<td>Planning</td>
<td>15</td>
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# ASSOCIATIONS EF

<table>
<thead>
<tr>
<th></th>
<th>Sensitivity</th>
<th>MM</th>
<th>Receptive language</th>
<th>Expressive language</th>
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<td>-.28</td>
<td>-.37</td>
<td>-.28</td>
<td>-.27</td>
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<tr>
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<td>-.26</td>
<td>-.14</td>
<td>-.05</td>
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<tr>
<td>Flexibility</td>
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<td>-.34</td>
<td>.04</td>
<td>.07</td>
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<tr>
<td>Emotion regulation</td>
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<td>-.28</td>
<td>-.07</td>
<td>.07</td>
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<td>Working memory</td>
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<td><strong>-.34</strong></td>
<td><strong>-.48</strong></td>
<td><strong>-.43</strong></td>
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<tr>
<td>Planning</td>
<td>-.17</td>
<td>-.33</td>
<td>-.24</td>
<td>-.31</td>
</tr>
</tbody>
</table>

* indicates statistical significance.
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
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