SUPPORTING EXECUTIVE FUNCTIONING IN INFANTS AND TODDLERS

PRESENTED BY HOLLY HIGGINS WILCHER
FOR BETTER BRAINS FOR BABIES
THURSDAY, SEPTEMBER 24, 2015
LEARNING OBJECTIVES

• Identify skills that constitute executive functioning
• Identify how the infant brain shapes executive functioning and related skills
• Identify risk factors that can disrupt executive functioning skill development
• Explore how to nurture executive functioning skill development in young children
POLL: WHO IS HERE?

- Early Childhood Teachers
- Early Childhood Program Administrators
- Early Intervention Specialists
- Home Visitors
- Early Childhood Mental Health Specialists
- Higher Education Faculty
- Trainer/Adult Educators
- Technical Assistance Specialists
- Policy Makers
- Others?
WHAT ARE EXECUTIVE FUNCTIONS?

ACTIVATION
- Organizing
- Prioritizing
- Getting to work

FOCUS
- Tuning in
- Sustaining focus
- Shifting attention

EFFORT
- Regulating alertness
- Sustaining effort
- Adjusting processing speed

EMOTIONS
- Managing frustration
- Modulating emotions

MEMORY
- Holding on and working with information
- Retrieving memories

ACTION
- Monitoring and regulating one’s actions

Executive function and self-regulation skills depend on three types of brain function: working memory, mental flexibility, and self-control. These functions are highly interrelated, and the successful application of executive function skills requires them to operate in coordination with each other.

SOCIAL EMOTIONAL AND EXECUTIVE FUNCTIONING

“Soft Skills”, Emotional Intelligence, etc.

- Conscientiousness
- Perseverance
- Curiosity
- Sociability
- Self-Confidence
- Cooperativeness
- Empathy
- Emotional Stability, Self-Regulation
POLL: WHAT EXECUTIVE FUNCTIONS AND/OR SOFT SKILLS DO YOU RELY ON MOST TO DO YOUR JOB?
EXECUTIVE FUNCTIONING RELIES ON THREE TYPES OF BRAIN PROCESSES

- Working Memory
- Cognitive Flexibility
- Inhibitory/Self Control

= Executive Functioning
Executive Function Skills Build Into the Early Adult Years

Why is Executive Functioning Important?

<table>
<thead>
<tr>
<th>School Readiness and Achievement</th>
<th>Positive Behaviors</th>
<th>Good Health</th>
<th>Successful Work</th>
</tr>
</thead>
</table>

- Good Health
- Successful Work
- Positive Behaviors

School Readiness and Achievement

- Why is Executive Functioning Important?

School Readiness and Achievement

- Why is Executive Functioning Important?
POLL: TRUE OR FALSE

In a 2006 study teamwork was identified as more important to potential employers than reading proficiency.
"VERY IMPORTANT" TO EMPLOYERS

<table>
<thead>
<tr>
<th></th>
<th>College Graduates</th>
<th>High School Graduates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Oral Communication</td>
<td>95%</td>
<td>70%</td>
</tr>
<tr>
<td>2. Teamwork</td>
<td>94%</td>
<td>72%</td>
</tr>
<tr>
<td>3. Work Ethic</td>
<td>94%</td>
<td>80%</td>
</tr>
<tr>
<td>4. Written Communication</td>
<td>93%</td>
<td>53%</td>
</tr>
<tr>
<td>5. Critical Thinking</td>
<td>92%</td>
<td>58%</td>
</tr>
<tr>
<td><strong>6. Reading</strong></td>
<td><strong>88%</strong></td>
<td><strong>62%</strong></td>
</tr>
<tr>
<td>7. Ethics/Responsibility</td>
<td>86%</td>
<td>63%</td>
</tr>
<tr>
<td>8. Leadership</td>
<td>82%</td>
<td>29%</td>
</tr>
<tr>
<td>9. Information Technology</td>
<td>81%</td>
<td>53%</td>
</tr>
<tr>
<td>10. Creativity/Innovation</td>
<td>81%</td>
<td>36%</td>
</tr>
<tr>
<td>11. Self-Direction</td>
<td>78%</td>
<td>43%</td>
</tr>
<tr>
<td>12. Diversity</td>
<td>72%</td>
<td>52%</td>
</tr>
<tr>
<td><strong>13. Mathematics</strong></td>
<td><strong>64%</strong></td>
<td><strong>30%</strong></td>
</tr>
<tr>
<td><strong>14. Science</strong></td>
<td><strong>33%</strong></td>
<td><strong>9%</strong></td>
</tr>
</tbody>
</table>

(Casner-Lotto & Benner, 2006)
POLL: TRUE OR FALSE

Babies are born with executive function skills.
BABIES AREN’T BORN WITH THESE SKILLS
A- NOT-B TASK

DIMENSIONAL CHANGE CARD SORT TASK

From around 15 years old
Working memory, shifting attention and inhibitory control relatively stable and close to adult level.
DISRUPTIONS IN EXECUTIVE FUNCTION

- Toxic Stress
- Neglect
- Abuse

- Lack of and/or Unhealthy Relationships
- **Anything** that Disrupts Healthy Development of Brain Architecture
DEVELOPING RESILIENCE

http://developingchild.harvard.edu/science/key-concepts/resilience/
POLL: WHICH OF THE FOLLOWING DOES RESEARCH SHOW IS THE STRONGEST PROTECTIVE FACTOR IN SUPPORTING RESILIENCE OF CHILDREN AT RISK

A. IQ
B. One stable and committed relationship with a supportive parent, caregiver, or other adult
C. Genetic Predisposition
D. Birth Order
STACK THE SCALES

Supportive Adult-Child Relationships
Self-Efficacy and Perceived Control
Adaptive Skills and Self-Regulatory Capacities
Faith, Hope, and Cultural Traditions
RECENT RESEARCH

• First evidence that abilities in infancy predict executive functions at age 11. (Rose, et al., 2012)

• Impact of prenatal risk on toddler effortful attention at age 27 months became nonsignificant once the model considered genetic influences were (Leve et al., 2013)

• EF skills at the beginning of preschool are a significant predictor of receptive vocabulary skills at the end of preschool, controlling for receptive vocabulary at the beginning of preschool (Weiland, et al., 2014)

• Maternal positive affect and infant frontal brain electrical activity measured when the children were 10 months jointly and uniquely predicted both preschool and post-kindergarten EF. (Kraybill & Bell, 2013).

• When well taught and when practiced regularly, it has been shown to be capable of improving mental health and well-being, mood, self-esteem, self-regulation, positive behavior and academic learning (Flock, et al., 2015; Weare, 2013).
POLL: CHILDREN ARE MORE LIKELY TO BUILD EFFECTIVE EXECUTIVE FUNCTION SKILLS IF THE IMPORTANT ADULTS IN THEIR LIVES ARE ABLE TO DO WHICH OF THESE?

A. Engage in activities in which they practice the skills
B. Guide them from complete dependence on adults to gradual independence
C. Protect them from chaos, violence, and chronic adversity, because toxic stress caused by these environments disrupts the brain circuits required for executive functioning and triggers impulsive, “act-now-think-later” behavior.
D. All of the above
E. None of the above
CHILDREN ARE MORE LIKELY TO BUILD EFFECTIVE EXECUTIVE FUNCTION SKILLS IF THE IMPORTANT ADULTS IN THEIR LIVES ARE ABLE TO

✓ Support their efforts;
✓ Model the skills;
✓ Engage in activities in which they practice the skills;
✓ Provide a consistent, reliable presence that young children can trust;
✓ Guide them from complete dependence on adults to gradual independence; and
✓ Protect them from chaos, violence, and chronic adversity, because toxic stress caused by these environments disrupts the brain circuits required for executive functioning and triggers impulsive, “act-now-think-later” behavior.
CRITICAL FACTORS FOR BUILDING EXECUTIVE FUNCTIONING SKILLS

- Children's Relationships
- Engagement Opportunities
- Live, Learn and Play Places
HOW CAN ADULTS PROMOTE THE DEVELOPMENT OF SKILLS THAT SUPPORT INFANT AND TODDLER EXECUTIVE FUNCTION?

- Establish Dependable Routines
- Model Prosocial Behavior
- Create and Maintain Supportive, Reliable Relationships
- Offer Activities that Foster Creative Play & Social Connection
- Teach Children How to Cope with Stress
- Encourage Vigorous Exercise
- Provide Opportunities for Autonomous Decision Making
**EXECUTIVE FUNCTION ACTIVITIES FOR 6- TO 18-MONTH-OLDS**

<table>
<thead>
<tr>
<th>Category</th>
<th>Activities</th>
</tr>
</thead>
</table>
| Lap Games for Younger Infants     | • Peek-a-boo  
                                 | • Trot, Trot to Boston; This is the Way the Farmer Rides; Pat-a-Cake         |
| Hiding Games                      | • Hide a toy under a cloth  
                                 | • Hiding another object  
                                 | • Having older infants hide themselves                                    |
| Imitation or Copying Games        | • Waving  
                                 | • Placing toy animals in a barnyard                                         |
| Simple Role Play                  | • Taking turns with any activity                                            |
| Conversations                     | • Mapping Words to Objects                                                  |
| Finger Plays                      | • Ensy Weensy Spider  
                                 | • Where is Thumbkin                                                        |
EXECUTIVE FUNCTION ACTIVITIES FOR 18- TO 36-MONTH-OLDS

**Active Games**
- Follow the Leader
- Freeze Dance
- Hokey Pokey

**Conversations and Storytelling**
- Have children identify the feelings and emotions of characters

**Matching and Sorting Games**
- Simple puzzles and sorting shapes and colors

**Imaginary Play**
- Sweeping
- Cooking in the pot
- Asking children questions while they’re pretending
RESOURCES AND APPLICATION OPPORTUNITIES

RESOURCE - Enhancing and Practicing Executive Function Skills with Children from Infancy to Adolescence
An activities guide for building executive function
Download PDF

RESOURCES AND APPLICATION OPPORTUNITIES

http://developingchild.harvard.edu/
RESOURCES AND APPLICATION OPPORTUNITIES

http://deltraining.com/courses/Executive_Function/content-frame.htm

Executive Functioning
Online Learning Module
RESOURCES AND APPLICATION OPPORTUNITIES

http://www.mindinthemaking.org/category/activities/#
RESOURCES AND APPLICATION OPPORTUNITIES

CLOSING THOUGHTS, COMMENTS, & REFLECTIONS
REFERENCES


• Building the brain’s "air traffic control" system: How early experiences shape the development of executive function; Working Paper 11. Center on the Developing Child at Harvard University, http://developingchild.harvard.edu/library/reports_and_working_papers/

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• Executive Dysfunction among Children with Reading Comprehension Deficits, Locascio, Gianna; Mahone, E. Mark; Eason, Sarah H.. Journal of Learning Disabilities, v43 n5 p441-454 Sep 2010


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• What are executive functions? (2011). Center on the Developing Child at Harvard University, [www.developingchild.harvard.edu](http://www.developingchild.harvard.edu)