Unstuck and On Target: Improving Executive Function, On-Task and Flexible Behavior

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Overview

- Does Executive Function matter in the real world?
- What is Executive Function and how does it develop?
- How can we help?
  - An Ounce of Prevention = Accommodations or Supports
  - Teaching Executive Function Skills
Global Problem of Executive Dysfunction:

“The curious dissociation between knowing and doing” (Teuber, 1964)
Executive Function and Adaptive Behavior

WISC FSIQ vs. VABS Composite

• EF abilities are linked to adaptive play, social and communication problems (Gilotty et al., 2002)

Kenworthy et al
Executive Function and Learning: Teacher EF ratings @ 4 years predict Math Fluency @ 6 yrs

EF problems in ASD & ADHD relate to:


- **Learning** (Akshoomoff, 2005; Blair & Razza, 2007; Raver et al, 2011)

- **Family stress** (Graziano et al, 2011; Lounds, 2007)

- **Adult outcomes** (Hume et al, 2009)
### Executive Function and Moral Turpitude

"Won’t" versus "Can’t"?

| “Oppositional, Stubborn” | Cognitive inflexibility  
|                         | Protective effort to avoid being overwhelmed  
| “Can do it if he wants to” | Difficulty shifting  
| “Doesn’t try” | Poor initiation  
|                 | Impaired planning & generativity  
| “Won’t put good ideas on paper” | Poor fine motor  
|                     | Disorganization  
| “Sloppy, erratic”  
| “Careless errors” | Poor self monitoring  
|                     | Impulsive  
|                     | Overloaded  
| “No self control” | Overload  
|                     | Disinhibition  
| “Not listening” | Poor attention or working memory  
| “Pushy, interrupts constantly” | Impulsive disinhibited  

"Not listening"
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What is EF?

Metacognitive Problem-Solving

- Initiate - begin task, activity, attention
- Working Memory - hold information actively in mind
- Plan - anticipate future events and develop steps
- Organize - establish, maintain order
- Self-monitor - attend to behavior/ performance; revise
What is EF?

Behavioral/ Emotional Regulation

- Inhibit - stop an action or not react to impulse
- Shift - move from one task or situation to another
- Emotional Control - regulate emotional response
How does Executive Function develop?

Figure 1. Developmental course of frontal functions based on average effect sizes of age-related change in performance on measures of frontal lobe functioning.
How does Executive Function develop?  
...in typical children...

SCIENCE TELLS US THE HUMAN BRAIN DOESN'T FULLY MATURE UNTIL A PERSON IS IN HIS EARLY TWENTIES.

ESPECIALLY THE PREFRONTAL CORTEX, WHICH GOVERNS RATIONAL THINKING. SO SCIENCE WOULD SUGGEST THAT PUNISHING JEREMY FOR TAKING YOUR CAR WOULD BE UNJUST.

SCIENCE SCHMIENCE... LET'S HAMMER HIM!

NOW YOU'RE SOUNDING LIKE A MOTHER!
How does Executive Function develop?
...in children with Executive Dysfunction...

- Significant age effects on the Working Memory subscale of the parent completed Behavior Rating Inventory of Executive Function (BRIEF); driven by worse ratings among 14-18 year olds compared to 5-7 year olds.
Inflexibility Risk: Getting Stuck

- Difficulty with violations of expectations
- Trouble “going with the flow”
- Rigid interpretations of rules
- Getting stuck on an idea or a perception
- Overwhelming intense feelings
- Trouble taking direction from others
- Difficulty negotiating, accepting differing viewpoints
- Repetitive Behaviors/Intense Interests
What about Vygotsky?

Social context

- Language
- Self directed speech
- Self regulation
- Executive control

(Luria, 1961)
Articulatory Suppression and Planning

- Articulatory suppression significantly reduced planning performance in the typically developing group ($p<.05$), not in the ASD group.
- Performance in the typically developing group under articulatory suppression closely resembled ASD performance under normal conditions.
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Unstuck Team

The Ivymount School Model Asperger Program
Take2 Summer Camp
- Katie Alexander
- Lynn Cannon
- Monica Werner

Children’s National Center for Autism Spectrum Disorders
- Laura Anthony
- Lauren Kenworthy
- Caroline Luong Tran
- John Strang
- Jenni Sokoloff
- Meagan Wills
Unstuck Philosophy: Accommodate, then Remediate

Neural Diversity is a civil right...

- Predictability and structure
- Make Big Picture Explicit
- Talk Less, Write More

- Avoid Overload
- Can’t vs Won’t
- Keep it Positive
Accommodations: Inflexibility

- Inflexibility is adaptive: limits unexpected, overloading events
  - Overload is dangerous: It leads to anxiety, impulsivity, inappropriate behavior
  - Overload creates profound risk in context of: Social isolation, teasing and bullying
  - In a mine field it is wise to use caution

- Respect
  - Routines that don’t interfere
  - Deep datasets
  - Expertise in areas of interest
Accommodations: Organization/Planning

- Emphasis on goals
- Safe Address
- Teach to strength: explicit short rules, recipes, checklists and routines.
- Put new information in familiar context.
- Explicitly review inferences, nuances.
- Predict decline in abilities as size of group increases.
“Sometimes it’s easier if you break the work up into little chunks.”
John has a book I want

Hit John, take book

Ask John for a turn

Time out-Miss TV time

Look at book, give it back, get TV time

Was this what I wanted?

Was this what I wanted?
Accommodations: Working Memory
Talk Less, Write More

• **Time:** Google calendar, iCal, Pure Calendar App, Outlook

• **Tasks:** Workflowy, ToodleDo, GoogleTasks, Checklists, recipes

• **Writing:** Noodle Tools, Inspiration, MyStudyBar, Readwritethink.org

• **Communication:** e-mail, texting, white board

• **Behavior:** Routines, rules

Source: The Lab School
Putting it into Action: Predicting and Reducing Overload

Catch Overload Early

Remember the last time your child became overloaded.... What occurred 15, 10 and 5 minutes before overload? Were there any warning signs? List overload warning signs your child makes (e.g. starts to talk loudly/faster/in a higher voice, gets stuck on something, humming, repetitive behaviors increase, more impulsive, more anxious, starts refusing to do things, clenches body):

1. ______________________________________
2. ______________________________________

List triggers (e.g. hunger, crowds, fatigue, too much talking) that lead to your child’s overload:

1. ______________________________________
2. ______________________________________

Defuse the Situation: What to Do

Remember the last time you were able to help your child with ASD avoid overload...

What did you do that calmed your child (e.g., steer them to a quiet place, touch or hold them, make a sign to them that cues them to calm down, use other visual cues, leave them alone)?

1. ______________________________________
2. ______________________________________

What coping strategies did your child use effectively (e.g. take deep breaths, distract self with a favorite activity, think of a favorite thing or place, ask for a hug)

1. ______________________________________
2. ______________________________________

What did you do that helped you stay calm (e.g. breathe deeply, think of how much you love your child, think of a calming melody, look at your child and put yourself in his shoes)?

1. ______________________________________
2. ______________________________________

Defuse the Situation: What not to do

Once your child is overloaded, it is usually not helpful to:

1. **Talk.** Reasoning at this stage makes things worse. Your child is unlikely to be able to process what is said. Learning can not happen when your child overloaded.
2. **Act Impulsively.** If you don’t know how to help your child, don’t do anything. An escalation of your emotions will probably escalate your child.
3. **Rush your child.** It can take a long time to recover from overload. Some children need hours of downtime.

An experienced ER doctor training new ER doctors once said “Don’t just do something, stand there!” When things are not going well it is hard for most of us to hold back, but that is how we observe what is happening and avoid making things worse than they already are.
Make it Fun: Keep it Positive

Emotions are Contagious

You're mad

Child mad

Child Madder

You're madder

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Global Problem of Executive Dysfunction:

- “The curious dissociation between knowing and doing” (Teuber, 1964)
- Hard to generalize EF skills (Ylvisaker et al., 2003)
- A college student with EF deficits: “My biggest problem in college has been executive functioning. I’m not organized, I’m late with everything and I don’t know how to get started. My school did a great job of including me in school, but why didn’t anyone teach me this EF stuff?”
- Consistency across settings
- Coach
- Make Implicit Explicit
- Support-fade-generalize
- Checklists
- Cues
- White Boards
- Humor, rewards
- Collaborate with your child
- Teach and use key scripts and words
- Teach by doing
- Use visual supports
- Make it fun!
Active Coaching

Scaffold  
Fade  
Generalize

http://www.bianys.org/learnet
<table>
<thead>
<tr>
<th>Flexibility Words</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flexible</strong></td>
</tr>
<tr>
<td>• Great job being flexible</td>
</tr>
<tr>
<td><strong>Unstuck</strong></td>
</tr>
<tr>
<td>• I'm getting stuck on ____, how can I get unstuck?</td>
</tr>
<tr>
<td><strong>Compromise</strong></td>
</tr>
<tr>
<td>• Let's compromise so we both get some of what we want</td>
</tr>
<tr>
<td><strong>Plan A/Plan B</strong></td>
</tr>
<tr>
<td>• What is our plan?</td>
</tr>
<tr>
<td>• What is our Plan B?</td>
</tr>
</tbody>
</table>
Flexibility Scripts

Big Deal/Little Deal
- How can we make this big deal into a little deal?

Choice/No Choice
- Is this a no choice situation?

Handling the Unexpected
- What will change?
- What will stay the same?
- Why is the change happening?
Target Goals/Whim Goals

**Target Goal**
To get to school on time

**Possible Whim**
Want to watch TV

**Plan**
Record show to watch later
When you have gotten derailed by a whim goal while making dinner.
“Ooops. My target goal was to make dinner, but here I am checking my e-mail. I guess that is a whim goal that I should only do after I finish making dinner, what do you think?

When you get distracted while shopping.
“Wait a minute, what did we come to the mall for, what was our target goal?” “So eating this ice cream cone right now is a whim isn’t it?”

Before a play date.
“What is your target goal for this play date?”… If no answer or a whim goal is offered: “What about making sure Elias has a good time so he will want to play with you again? Or what about having Elias become your friend?” … “What are whims that could get in the way of your target goal”? If no answer or an inappropriate whim is offered: “What about wanting to go first in every game you play?”

Target key times of day when your child often gets derailed.
Before going to bed you could say, “What do you think the target goal is for the morning before school?” [Or: “My target goal for the morning before school is getting you to school on time and me to work on time.] Write the goal down on a post-it note. Then say, “What whims could get in our way?”

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Goal, Plan, Do, Check

Goal
What do we want to do?

Plan
How will we do it?

Do
Let's try our plan

Check
How did it work?
Running errands:
My goal was to finish all my errands today, so I could just relax tomorrow, and my plan was to do the grocery shopping, get the car fixed, get your prescription filed and get home in time to run before dinner, but now it is 5pm and I have only done the first two steps on my plan, can you help me come up with a plan B?

Your spouse wants to go out with old friends:
If your goal is for me to let you go out on Saturday night, you need a plan that includes giving me a foot rub during the day!

Your child is resisting homework:
You had a goal of getting an A in math right? Wasn’t part of the plan for achieving that goal doing your homework?
Goal: What do you want to do? Keep my room clean

Plan A: How do you want to do it?
Put clothes away:
  - Clean clothes in the closet
  - Dirty Clothes in the hamper
Put toys in toy box
Put books on bookshelf
When I finish cleaning my room, I get to play a game with Mom.

Do: When do you want to try out your plan? I will create a checklist of my plan and do the plan everyday after snack, checking off my checklist as I go. Every time that I do my plan, I get to play a game with mom.

Check: How did it go? Do I need to add any steps to the checklist?
**CLEAN ROOM CHECKLIST**

<table>
<thead>
<tr>
<th>Steps to a clean room...</th>
<th>Check it off!</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pick up clothes</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
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<td>4.</td>
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<td>5.</td>
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<td>6.</td>
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<tr>
<td>7.</td>
<td></td>
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<tr>
<td>8.</td>
<td></td>
</tr>
<tr>
<td>9. Get my reward!</td>
<td></td>
</tr>
</tbody>
</table>
Unstuck Trial:  
Participant Demographics  
Kenworthy & Anthony et al., 2014

<table>
<thead>
<tr>
<th></th>
<th>Unstuck (n=47)</th>
<th>Social Skills (n=20)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male</strong></td>
<td>87%</td>
<td>90%</td>
</tr>
<tr>
<td><strong>White</strong></td>
<td>70%</td>
<td>55%</td>
</tr>
<tr>
<td><strong>On Psychotropic Medication</strong></td>
<td>55%</td>
<td>60%</td>
</tr>
<tr>
<td><strong>Mean (SD)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>9.49(1.00)</td>
<td>9.58(1.10)</td>
</tr>
<tr>
<td>Mother’s education</td>
<td>1.91(0.88)</td>
<td>1.95(0.76)</td>
</tr>
<tr>
<td>Father’s education</td>
<td>2.04(1.12)</td>
<td>1.95(0.91)</td>
</tr>
<tr>
<td>WASI FSIQ</td>
<td>108.80(18.52)</td>
<td>107.63(17.20)</td>
</tr>
<tr>
<td>ADOS Social+Comm</td>
<td>11.64(3.76)</td>
<td>12.00(4.39)</td>
</tr>
<tr>
<td>ADOS Stereotyped Beh</td>
<td>1.98(1.71)</td>
<td>1.90(1.33)</td>
</tr>
</tbody>
</table>
WASI Block Design
Higher Score = Better Performance

Cohen’s $d=0.65$
Mean Challenge Task Flexibility
Higher score = Less flexible

Cohen’s $d = -0.72$

Kenworthy & Anthony et al., submitted
Proportion of Individuals Who Improved by Blinded Classroom Observation

![Bar chart showing the proportion of individuals who improved in various classroom observations. The x-axis represents different classroom observations including Reciprocity, Rule Abidance, Transitions, Gets Stuck, Negativity/Overwhelm, and Participates. The y-axis represents the percent improved. The chart indicates that the proportions for Social Skills and Unstuck vary across these observations.](Kenworthy & Anthony et al, submitted)
Parent & Teacher BRIEF Shift
Higher score = Less flexible

Parent Cohens $d=-0.64$; Teacher Cohen’s $d=-0.89$
Conclusions

- Unstuck = SS for social skills
- Unstuck > SS for flexibility, problem solving, and transitioning, negativity and following rules in class
- Unstuck > SS real world planning/organization
- Many Unstuck gains maintained 1 year after intervention

Anecdotal evidence

- Parent: “This has been a life changing experience for my daughter”
- Teacher: “One student had three meltdowns per day, and UOT reduced her outbursts to two occurrences in one quarter”
- Parent: “UOT was a lifesaver for us this year!”
Books on Supporting and Teaching Executive Function

- *Solving Executive Function Challenges: Simple Ways to Get Kids with Autism Unstuck and on Target* Kenworthy et al (2014)
- *Smart by Scattered* Dawson & Guare (2009)
- *Late Lost and Unprepared* Cooper-Kahn & Dietzel (2008)