Tools for improving executive functions and helping children with autism become more flexible and resilient

Lauren Kenworthy, PhD
Associate Professors, Pediatrics, GW Medical School
Director, Center for Autism Spectrum Disorders
Children’s National Medical Center

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lkenwort@cnmc.org
GOAL: Increase your understanding of executive functions and how to enhance them

PLAN

1. The problem: Poor outcome
2. Define Executive Functions (EF) & why they matter for outcomes
3. Understand & accommodate EF deficits:
   a. Flexibility
   b. Organization/Integration
4. Teach flexibility, organization & planning skills
Adult Outcome in HFASD

• 46% of children with ASD have IQ in the average range

• Despite average intelligence, adult outcome remains poor (Henninger & Taylor, 2012; Howlin et al., 2004; Howlin & Moss, 2012; Shattuck et al., 2012; Roux et al., 2013).
  – Underemployed, underpaid, socially excluded,
  – Poor adaptive skills, dependent on parents (88%)
  – Even when compared to other developmental disabilities

• Over 25% of the young adults without ID have no daytime activities of any kind (Taylor & Mailick Seltzer, 2010)
Debbie Fein: What Leads to Optimal Outcome?

• A few children with ASD can reach *typical* levels of social functioning with no residual symptoms
• Earlier intervention and more ABA (Orinstein et al, JDev Behav Pediatr, 2014)
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What is Executive Function?

Cognitive Regulation
- Initiate
- Plan & Working Memory
- Organize/Integrate
- Monitor

Behavior Regulation
- Inhibit
- Self-Monitor

Emotion Regulation
- Flexibility
- Emotional Control
Executive Dysfunction (Teuber, 1964): “The curious dissociation between knowing & doing”

**EF problems in ASD relate to:**

- **Learning**
- **Adaptive daily living skills** (Lopata et al, 2012, Gilotty et al, 2002)
- **Family stress** (Lounds, 2007)
- **Adult outcomes** (Hume et al, 2009)
**EF relates to autism sx and supports social learning**

- **Joint attention:** “early developing self-organizing facility” (Mundy, 2003)
- **Prolonged visual fixation in infants later dx’d with ASD, coincides with emergence of ASD behaviors** (Zwaigenbaum et al, 2005)
- **EF predicts change in ToM (independent of age, language, NVIQ)** (Pellicano, 2010)
- **Indirect “trickle-down” effect of EF training on TOM performance** (Fisher and Happé 2005) and social skills (Kenworthy & Anthony et al, 2014)
<table>
<thead>
<tr>
<th>Looks Like Won’t…</th>
<th>Could be Can’t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oppositional, Stubborn</td>
<td>Difficulty shifting</td>
</tr>
<tr>
<td></td>
<td>Avoiding overload</td>
</tr>
<tr>
<td>Can do it if he wants to</td>
<td>Difficulty shifting</td>
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<tr>
<td></td>
<td>Lack of salience</td>
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<tr>
<td>Self Centered</td>
<td>Impaired social cognition</td>
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<tr>
<td></td>
<td>Poor self monitoring</td>
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<tr>
<td>Won’t put good ideas on paper</td>
<td>Poor fine motor</td>
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<tr>
<td></td>
<td>Disorganization</td>
</tr>
<tr>
<td>Sloppy, erratic</td>
<td>Poor self monitoring</td>
</tr>
<tr>
<td></td>
<td>Overloaded</td>
</tr>
<tr>
<td>Won’t control outbursts</td>
<td>Overloaded</td>
</tr>
<tr>
<td></td>
<td>Disinhibition</td>
</tr>
<tr>
<td>Doesn’t care what others think</td>
<td>Impaired social cognition</td>
</tr>
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<td></td>
<td>Poor self monitoring</td>
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Unstuck Team

Ivymount Model Asperger Program/Take2 Summer Camp

• Katie Alexander
• Lynn Cannon
• Monica Werner

Children’s National Center for Autism Spectrum Disorders

• Laura Anthony
• Lauren Kenworthy
• John Strang
• Cara Pugliese

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Unstuck Philosophy: Accommodate, then Remediate

Neural Diversity is a civil right...

Overwhelmed people can’t learn

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

- Avoid Overload
- Can’t vs Won’t
- Keep it Positive
What is Executive Function?

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Emotion Regulation
- Flexibility
- Emotional Control
Most Common EF Challenges in ASD

Flexibility
- Transitioning from one activity to another
- Changes in routine
- Violations of expectations
- Seeing more than one way of doing things
- Easy to get stuck
“Asperger’s is like a vise on your brain. And each unexpected event is like another turn on the vise...it just keeps building until you feel like you’re going to explode. Sometimes when you explode, it comes out the wrong way.”

- A young student with ASD
What does cognitive inflexibility look like in school and at home?

Can’t or Won’t?

• Accept feedback
• Accept different opinions, ideas
• Handle frustration
• Start something they don’t want to do
• Stop meltdowns
• Stop doing something even they have been told to stop
• Avoid shutting down when something is challenging
• Stop correcting people
• Let other kids take the lead when playing
Inflexibility Risks and Accommodations

Difficulty with violations of expectations

- Schedules, Routines, Predict change, Flexible Adult

Rigid interpretations of rules

- Respect need for clear, explicit expectations, Flexible Adult

Overwhelming intense feelings

- Breaks, Downtime, Safe Address, Flexible Adult

Problems Negotiating

- Compromise, Explicit Etiquette Rules, Flexible Adult

Repetitive Behaviors/Intense Interests

- Decide where they can/can’t happen, agree on a sign
Accommodations: Inflexibility

Inflexibility is adaptive. It 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
- Persistence
- Reliability
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- Changes in routine
- Violations of expectations
- Seeing more than one way of doing things
- Easy to get stuck

Planning/Organization
- Knowing how to accomplish a goal
- Prioritizing
- Identifying main idea and organizing thinking
- Can’t see the forest for the trees
What do organization/integration deficits look like in school and at home?

Can’t, or Won’t?
• Gets stuck on details
• Get good ideas onto paper
• Stop dominating a classroom discussion
• Let go of a small mistake or inconsistency
• Behave in unstructured groups
• Set a goal
• Link new learning to old learning
• Write a well organized paragraph
• Draw meaning from a reading assignment
• Know what to study for on a test
Missing the big picture risks

– **Lack of generalization**: “My daughter can peel a potato but she can’t peel a sweet potato because they are not the same thing.”

– **Lack of awareness** that a problem exists

– **Difficulty knowing what is important**: “Recently, my son lost his backpack on his bike ride home. To fix the problem, he called 911. Fortunately, the police officer understood.”

– **Difficulty anticipating** obstacles

– Dealing with failure
Accommodations for Disorganization

- 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.
- Study guides, closed format tests
- Writing rubrics
“Sometimes it’s easier if you break the work up into little chunks.”
Break it Down

John has a book I want

- Hit John, take book
  - Time out-
    - Miss TV time
  - Was this what I wanted?

- Ask John for a turn
  - Look at book, give it back,
    - get TV time
  - Was this what I wanted?
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- Make Big Picture Explicit
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The Importance of Inner Speech

Social context

Language

Self directed speech

Self regulation

Executive control

(Luria, 1961)
Articulatory Suppression and Planning

Wallace et al. (2009) *Journal of Autism and Developmental Disorders*
Poor planning/Inner Speech/Working Memory Looks Like: Won’t follow directions, work independently

- Talk Less, Write More: White Boards
- Use technology for tracking tasks, calendar, writing
- Communication: e-mail, texting
- Notes
- Computer-based curricula
- Socratic method
Unstuck Philosophy: Accommodate, then Remediate

Neural Diversity is a civil right...

Overwhelmed people can’t learn

- Talk Less, Write More
The most important accommodations of them all: **Be Flexible and Keep it Positive!!**

Emotions are Contagious  
…and Flexibility is too

Reinforcement Breaks the Cycle

- Child mad
- You’re mad
- Child Madder
- You’re madder

1. Correction or command
2. Praise
3. Praise
4. Praise
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Employment Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonverbal</td>
<td>May be less likely to verbally disrupt fellow coworkers</td>
</tr>
<tr>
<td>Limited social interest</td>
<td>May stay more focused on work and not waste time</td>
</tr>
<tr>
<td>Strong sensory preferences</td>
<td>May enjoy working in a quiet office</td>
</tr>
<tr>
<td>Is very schedule- or rule-bound</td>
<td>Comes to work on time, takes breaks at the right time, and returns from break on time</td>
</tr>
<tr>
<td>Appears ritualistic or compulsive</td>
<td>May offer excellent attention to detail and quality control</td>
</tr>
</tbody>
</table>
Overload: Looks like anxiety, impulsivity, meltdowns
Brenda Smith Myles: *AS and Difficult Moments*
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Teaching Executive Function Skills
OR... bridging the dissociation between knowing and doing

The Challenge:
• A student with ASD: “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?”
• EF skills are hard to generalize (Ylvisaker et al, 2003)

The Strategy:
• Embed teaching in the real world: school & home
• Show, model and coach
- Consistency across settings
- Checklists
- Cues
- White Boards
- Coach
- Make Implicit Explicit
- Scaffold-fade-generalize
- Humor, rewards
- Collaborate with child

Teach and use key scripts and words

Teach by doing

Use visual supports

Make it fun!
Teaching: Why Be Flexible

• Advantages of physical flexibility
• The “facts” of life
• What to do when what I want is impossible
• Pie charts: getting part of I want is better than getting nothing at all
Teach How to Be Flexible: Self-Regulatory Scripts

- Avoid too much talking
- Refer to the big picture
- Build an alliance—you’re helping
- Need to be practiced
How to be Flexible: Words and Scripts

Flexible

- Great job being flexible

Unstuck

- I'm getting stuck on ____, how can I get unstuck?

Compromise

- Let's compromise so we both get some of what we want

Plan A/Plan B

- What is our plan?
- What is our Plan B?
## Flexibility Scripts

<table>
<thead>
<tr>
<th>Big Deal/Little Deal</th>
<th>How can we make this big deal into a little deal?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice/No Choice</td>
<td>Is this a no choice situation?</td>
</tr>
</tbody>
</table>
| Handling the Unexpected | What will change?  
                           | What will stay the same?  
                           | Why is the change happening? |

Ylvisaker & Feeny, 1998; Feeny & Ylvisaker, 2008
**GPDC** (goal, why, plan, do, check)

<table>
<thead>
<tr>
<th>Goal</th>
<th>To have fun at recess</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why</td>
<td>Recess is my free time</td>
</tr>
<tr>
<td>Plan A</td>
<td>Ask Johnny if he wants to play soccer</td>
</tr>
<tr>
<td>Plan B</td>
<td>(If J says, “no”) Ask Melissa to play soccer</td>
</tr>
<tr>
<td>Plan C</td>
<td>Swing on the swings</td>
</tr>
<tr>
<td>Do</td>
<td>Follow my plans</td>
</tr>
<tr>
<td>Check</td>
<td>Did I meet my goal?</td>
</tr>
<tr>
<td></td>
<td>Which plan worked?</td>
</tr>
<tr>
<td></td>
<td>Would I do it the same or different next time?</td>
</tr>
</tbody>
</table>
On Target for Life

Teaching techniques:

**Scripts and Vocabulary** – simple and meaningful words and phrases used in many contexts to teach and generalize skills:

“*How to increase power in my life?”*

“That’s an interesting **detail**. How long should we get stuck on it?”

“What is the **big picture**?”

“When and how to **compromise**”

“**Eyes on the prize**”

“**Making it real!**” (using the skills in my life)
On Target for Life

Organizing visuals:

- **Flexibility**
  - Plan A/B
  - Compromise

- **Big Picture**
  - Stuck on a detail?
  - Goal-Why-Plan-Check

---

**APPROVAL BOOSTERS**

- Be Respectful and Think about others

---

**POWER**

- Choices
- Goals
- Rewards

Power Equation Visual
<table>
<thead>
<tr>
<th>Power Loss</th>
<th>Power Boosters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stuck thinking &amp; feeling</td>
<td>Flexible thinking &amp; feeling</td>
</tr>
<tr>
<td>Stuck on a detail</td>
<td>Big picture thinking</td>
</tr>
<tr>
<td>Not Caring When You Upset Others</td>
<td>Boosting Your Approval</td>
</tr>
<tr>
<td>Zoning out</td>
<td>Actively Listening</td>
</tr>
<tr>
<td>Being negative</td>
<td>Supporting Others</td>
</tr>
<tr>
<td>Being Rigid</td>
<td>Compromising</td>
</tr>
<tr>
<td>Jumping into your Plan without the Big Picture</td>
<td>Checking Your Plan for Dangers</td>
</tr>
<tr>
<td>Forgetting or Giving up on the Goal</td>
<td>Being persistent</td>
</tr>
</tbody>
</table>

Eyes off the Prize    Eyes on the Prize
Time use on an average weekday for full-time university and college students

NOTE: Data include individuals, ages 15 to 49, who were enrolled full time at a university or college. Data include non-holiday weekdays and are averages for 2009 - 13.
Danger Pie or Balanced Pie?

- Sleeping: 9.5 hours
- Leisure: Games/TV/Social Media: 5 hours
- Leisure: Exercise: 7.5 hours
- Grooming: 1 hour
- Work: 1 hour

Pie chart representing time allocation.
Not interested in goal

Thinking about goal

Creating Your Plan

Put Your Plan A into Action

Put Your Plan B/C/D into Action

Continue to work on Big Picture

Goal:

Why:

Plan: 1.

2.

3.

4.

5.

Check:

Stuck?
Blinded Classroom Observations

Kenworthy & Anthony et al, 2014
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)
- *The Incredible Flexible You & Superflex* Michelle Garcia Winner
- *Smart by Scattered* Dawson & Guare (2009)
- *Late Lost and Unprepared* Cooper-Kahn & Dietzel (2008)
Find your people:
What do these people have in common?

• Tim Page, Pulitzer prize winner
• Vernon Smith, noble laureate
• Satoshi Tajiri, creator of Pokémon
• Matt Savage, “Mozart of jazz”
• Daryl Hannah, actor
• Dan Aykroyd, comedian
• Heather Kuzmich, model
• Richard Borcherds, mathematician
• Michael Burry, US investment fund manager