STRATEGIES TO ENHANCE EXECUTIVE FUNCTIONING AT HOME AND IN THE CLASSROOM

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Overview

• Define executive functions (EF)

• Discuss the relationship between EF and mental health

• Describe why EFs are important

• Review the current trends for improving EF

• Introduce the thinkSMART™ program’s concrete behavioral approaches to improving EF
What are executive functions (EFs)?

- Control functions needed for the brain to accomplish and maintain goal directed activities
  - “the process of doing”
  - Higher order problem solver
  - “driver” of the brain

Schiltz, 2011; Diamond, 2013; Lundt et al., 2012; Diamond et al., 2012
Executive Functions

- Planning
- Problem Solving
- Inhibition
- Organization
- Cognitive Flexibility
- Fluency
- Time Awareness; Management
- Emotional Control
- Working memory
- Task initiation
EFs and the brain

- The frontal lobes!
  - Executive functions are controlled through various neural circuits within the prefrontal cortex (PFC)

- PFC comprises ~30% of the entire cortex!

- EFs continue to develop into early adulthood (e.g., age 21)
  - Important to intervene early!
When do EFs develop?

EFs begin to develop early!

- **Ages 3-5**
  - inhibition, working memory, cognitive flexibility, goal directed behaviors and planning
  - With WM online→problem solving improves

- **Ages 4-5**
  - Day-to-day EF skills emerge with metacognition, greater flexibility, and inhibitory self-control
  - Preschool age kids reliably show: inhibition, shifting, emotional control, working memory, and plan/organize

- **Ages 6+**
  - task initiation, organization of materials, self-monitoring

- What might deter appropriate development?

Senn, 2004; Isquith, Gioia, & Espy, 2004
EFs and mental health

- Addiction
- Attention Deficit Hyperactivity Disorder (ADHD)
- Conduct Disorder
- Depression
- Obsessive Compulsive Disorder
- Schizophrenia
- Anxiety
- Autism
- Learning Disorders
- Traumatic Brain Injury

EFs suffer disproportionately to other brain areas in response to:
- Sadness
- Stress
- Loneliness
- Lack of physical fitness
- Sleep deprivation

Why are EFs important?

- EFs in childhood predict EF in adulthood and worsen as people age

- Executive functioning has been associated with:
  - school and job success
  - Relationship success (marriage/friendships)
  - Mental and physical health
  - Quality of life
  - Self-reliance/Strong identity development

- In a 30-year follow-up, poor self-control as a child was associated with:
  - Worse health
  - Less monetary earnings
  - Less happiness
  - More crime

Diamond, 2011; Diamond, 2013 (for review); Moffitt et al, 2011; Galambos et al., 2005
Self-control gradient. Children with low self-control had poorer health (A), more wealth problems (B), more single-parent child rearing (C), and more criminal convictions (D) than those with high self-control.

“If correct, the observed gradient implies room for better outcomes even among the segment of the population whose childhood self-control skills were somewhat above average. Universal interventions that benefit everyone often avoid stigmatizing anyone and also attract widespread citizen support” (Moffitt et al., 2011).
Indirect Routes

- Increases Joy
- Improves Physical Fitness
- Increases Feelings of Social Belonging and Support

Direct Route

- Builds Confidence, Pride, and Sense of Self-Efficacy

Builds EFs: Requires Concentration, Focus, Discipline, Holding Complex Sequences in Working Memory, and Quick, Flexible Adaptation to Changed Circumstances

- Reduced Incidence and/or Severity of EF Disorders (e.g., ADHD, Addictions, and Conduct Disorder)

Improved Academic Outcomes and School Success

Positive Feedback Loops
EF Interventions

- The good news: EFs can be improved!
- Computer based programs:
  - CogMed® for working memory
  - Computer games for cognitive flexibility
- School-based programs:
  - Promoting Alternative Thinking Strategies (PATHS)
  - Chicago School Readiness Project (CSRP)
- Alternative programs:
  - Tae kwon do
  - Yoga
  - Mindfulness
  - Aerobics

Klingberg et al., 2010; Diamond & Lee, 2011; Bergman, Nutley et al., 2011; Thorell et al., 2009; Karback & Kray, 2009; Lakes & Hoyt, 2004; Raver et al., 2008, 2001; Riggs et al., 2006; Flook et al., 2010
EF Interventions

• The brain is a huge muscle—needs consistent strengthening!

• What’s the perfect recipe?
  • Practice (daily)
  • Reinforcement (rewards)
  • Skills should be just beyond proficiency
  • Skills improve when EF demands are high and the challenge remains high
  • Transfer of skills increases from training to other areas when EFs are addressed globally, rather than discretely
  • School curricula challenges/trains EFs throughout the day

Wait a second! I didn’t have to be taught those skills. I just did them!

It’s not that hard to use a post-it. I put them all over the place to remind you!
Why behavioral interventions?

• Medications are not enough!
  • Clinical range impairments are typically still observed after stimulants

• Organizational skills can be improved with intervention!

• Many youths lack the proficiency at skills related to day-to-day executive functioning:
  • Organize materials
  • Track assignments
  • Manage time
  • Plan work

Langberg et al., 2008; Pfiffner et al., 2007; Abikoff et al., 2009
Why behavioral interventions?

- Problems with organization, time management and planning are behavioral manifestations of poor EF

- Problems with organization, planning, time management, losing belongings are associated with:
  - Reduced school performance and scholastic attainment
  - Increased conflict with parents and teachers
  - More difficulties with peer relationships

- Problems with organization, planning, and time management persist into adulthood

Barkley & Fischer, 2011; Power et al, 2006; Barkley et al, 1997; Diamantopoulou et al., 2007
• Obstacles for youth (particularly with ADHD):
  • Skills Deficit
  • “Delay aversion” deficit: weaknesses in motivation and follow-through
  • Performance deficit: EF weaknesses in linking behaviors to outcomes

• ADHD is “not a disorder of knowing what to do, but of doing what one knows”—Russel Barkley (2006).
Randomized controlled trial

- Participants (N=180):
  - 3rd-5th grade children
  - ADHD diagnosis
  - Significant problems in organization, time management and planning
- Randomized into one of 3 conditions:
  - Organizational skills training (OST)
  - Performance based intervention
  - Wait-List
- 20 sessions (2x/week for 10 weeks)

Results

• Both treatments improved:
  • Homework management and related problems*
  • Academic proficiency
  • Family cohesiveness and conflict

• Organizational skills training improved:
  • Parent-reported organization, time management and planning
  • Sustained at follow-up

• Support for skills-based, child-focused intervention!

*effect sizes similar to stimulants

Limitations

- Non-generalizable: ADHD only and grade-school
- 40% of youth continued to display clinically significant problems
- Feasibility of 2 sessions per week
- Only focus on some aspects of EF
- Limited parent involvement
I shouldn't have to reward my teen for doing something that he should be doing anyway.

Why should I try something new when my way is working…well, sorta working.

My child should be doing this on her own. Her classmates are doing it without help!

I just don’t want to…

I tell her this over and over again. It’s like she doesn’t even care!

Ugh! I’m going to be up all night finishing this paper…again! I should have started earlier.

He knows what he's supposed to be doing. He just needs to do it!

I’ll take the trash out after I finish playing this video game…

I shouldn't have to reward my teen for doing something that he should be doing anyway.
What is thinkSMART™?

• Format
  • 12-Sessions (1x week)
  • Group intervention
  • Parents included
  • Groups for ages 12+
  • No diagnosis required
  • Cognitive-behavioral approach

• Goals: **think SMARTER, not HARDER!**
  • Psychoeducation on EF
  • Teach behavioral strategies
  • Improve areas of EF weakness
  • Increase independence of youth
  • Increase parent effectiveness
Keys to thinkSMART™

• What does the literature tell us?
  • Skills can be taught to adults and children
  • Practice makes perfect
  • Parents are critical--reinforcement (rewards, praise, prompting)
  • Emotions and the associated cognitions are important targets
  • Groups increase positive modeling, social reinforcement and support
  • Group intervention is cost-effective

• Included in every session:
  • Mindfulness
  • Didactic instruction on skill
  • In-session practice of skill
  • Discussion of obstacles
  • Problem solving
  • At-home skill building activity
  • Weekly reminders

Abikoff et al, 2013; Solanto et al, 2010; Diamond, 2012
thinkSMART™ obstacles

- Youth “buy-in” (feeling like they know or don’t need it)

- Parent commitment

- Effort needed (“change would be too hard”; prefer the easy way)

- Parent EF weaknesses

- Parent “saving” child
thinkSMART™ targets

- Planner use
- Time awareness
- Scheduling
- To-do lists
- Time management
- Breaking things down
- Task initiation
- Increasing motivation & rewards

- Organization
- Long-term planning
- Emotional control
- Effective Communication
- Behavior Activation
- Sleep Hygiene
What makes thinkSMART™ smart?

• *Major* role of the parent

• Weekly practice/habit formation

• Skills based

• Added components: Mindfulness, sleep hygiene, emotion-focus, study skills
Mindfulness

- Empirically supported treatment for:
  - ADHD (kids and adults)
  - Mood
  - Parent-child interactions
  - Pain
  - Anxiety

- Three primary aspects to Mindfulness
  - Attention
  - Awareness
  - Non-judgmental

Segal et al, 2002; Zylowska et al, 2008; Khoury et al., 2013
Skill Building!

- Catch your distraction!
Planner use

- Why use a planner?
  - It’s your brain’s dump!

- What makes a good planner?
  - Week view
  - Enough space
  - Notes section

- Obstacles to planner use:
  - Lazy
  - Don’t have it on me
  - Not enough time to write it down
  - I’ll remember it
  - It’s online
Planner Use

- The problem with technology…
A planner should have one job: PLANNING!

- Remember, if you don’t use it, you lose it!
Time Awareness and Scheduling

• Before you can manage time, you must be aware of time
  • Individuals with ADHD and executive dysfunction have poor time awareness

• Skills:
  • Time estimation
  • Wear a watch

• Efficiency Explosions!
  • Those little bits of time that can make you more efficient
  • Help the child identify these through prompts and modeling
Time Awareness and Scheduling

**Tips for effective scheduling:**
- Multiple your time estimation by 2
- Regular schedule for everyday tasks: Routine is good!
  - After-school routine
  - Strict/rigid is okay!
- Use energy to dictate task order
  - Tired? Do on easy task
- Use *Efficiency Explosions* for little tasks
- If the schedule gets messed up, start again!
To-Do Lists

• What goes on a to-do list?
  • Activities that you can fit in an efficiency explosion (5-30 minutes)
    • If takes longer than that—break it down
  • Things and/or tasks you are worried that you might forget

• Be SPECIFIC
  • All to-do list items should be tangible and concrete

• Be BRIEF
  • Daily to-do list vs. weekly to-do list
  • Can be tasks that are a part of a bigger project

• Think of these as roadmaps
• Newton’s 1st Law!

• Hardest part is getting started…but once you get going…

• 5-minute rule

• How small can you go?
Increasing Motivation and Rewards

Task Completion & Perseverance

- Self Contingent Rewards
  - If-then contingencies
  - Using small “tasks” as rewards (e.g., drink of water)

- No fun until it’s done…unless, you can make it fun to get it done!
Steps to successful organization

1. Group like items (e.g., pens, homework, sports equipment)
2. Decide where to store them*
   - Bedroom
   - Desk
   - Folders
   - Should be linked with the item’s purpose!
   - Stick to this decision—it’s the item’s new home.
3. ALWAYS put items in their place
Organization

School Organization

- Accordion Folders
  - Tabs
  - Sections
- Binders for individual classes
  - Hole punch everything
  - Action v. No Action
- Planner use to help organization
  - List necessary materials in planner
  - Use short hand to reduce burden of writing
- Homework/Study Spot
  - Designate a “place”
  - Reduce distractions
How can educators help?

- Implement these skills in the classroom
- Check the use of planners
- Help create an organizational system for class materials
- Use behavioral reinforcement strategies (e.g., rewards!)
- Use class time to actively break big tasks down
- Set deadlines for “parts” of projects
- Identify and praise a skill that has worked
- Develop a communication plan with parents
Case Study: JP

- Presenting complaint:
  - 13-yo male
  - History of major depression
  - ADHD
  - High average intellect, but low grades
  - Difficulties with task initiation/completion
  - Perfectionism
  - Competitive
Results

Pre-thinkSMART vs Post-thinkSMART

Variables:
- BRIEF_P tntt
- BRIEF_P tSht
- BRIEF_P tEC
- BRIEF_P tBRI
- BRIEF_P tInit
- BRIEF_P tWM
- BRIEF_P tPO
- BRIEF_P tOrg
- BRIEF_P tMon
- BRIEF_P tMI
- BRIEF_P tGEC
• “…he still wears his watch, he uses his planner. It bailed him out a couple of weekends when he forgot to do something then checked and remembered. A new white board in the hall with a list like house key, medicine, lunch, water, homework, etc. has helped him make sure he is less forgetful leaving the house!” –JP’s mother
Keys to improvement

• Parent involvement/engagement
  • “I feel like our relationship is better because we are going through this together! We talk about using the skills.” –Mom of 15 year old boy

• Improved communication
  • “The other day, my mom identified that I was on a thought train [mindfulness skill], which helped me recognize this.” –14 year old boy

• Social comparison
  • “Fine, I’ll write in my planner but only because you’re bringing us cookies if we all do it.”—13 year old girl

• Validation of struggles
  • “wait, you forgot your backpack this week, too?”—13 year old boy
Conclusions

• Executive functions **CAN** be improved through behavioral strategies.

• Creating new habits is **difficult**—**for everyone**!

• Repetition and reinforcement from teachers/parents is critical.

• Youth need to be held accountable and rewarded for use of skills.

• Skills should be practiced **DAILY**.
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