

## EXECUTIVE AND ORGANIZATIONAL SKILLS INTERVENTIONS FOR YOUTH WITH ADHD

Matthew Jarrett, Ph.D., Assistant Professor,  
Department of Psychology, University of Alabama

## Agenda

- Discuss the importance of executive functioning as a transdiagnostic construct that is particularly associated with ADHD
- Discuss evidence-based interventions for ADHD and for executive functioning
- Discuss interventions such as organizational skills training that might help to compensate for executive functioning deficits

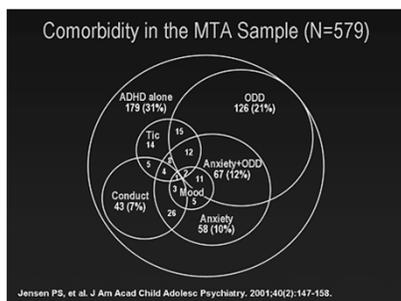
## My Background

- Undergraduate work at Cornell University
- Post-Bac Position
  - Research assistant with the Duke University Medical Center ADHD Program
  - Worked on follow-up phase of MTA Study and brain imaging study with parent-child dyads with ADHD
  - Observations
- Doctoral work at Virginia Tech with Tom Ollendick
  - Research on ADHD and anxiety comorbidity
- Internship at Children's National Medical Center
- Assistant Professor at Alabama since 2010

## Angold, Costello, & Erkanli (1999)

- ADHD and oppositional defiant disorder (ODD)/conduct disorder (CD): Odds Ratio = 10.7
- ADHD and depression: Odds Ratio = 5.5
- ADHD and anxiety: Odds Ratio = 3.0
- What if we compare two disorders but control for the other disorders?
  - ADHD associated with ODD/CD
  - ADHD associated with anxiety
  - ADHD related to depression via ADHD's association with anxiety and ODD/CD

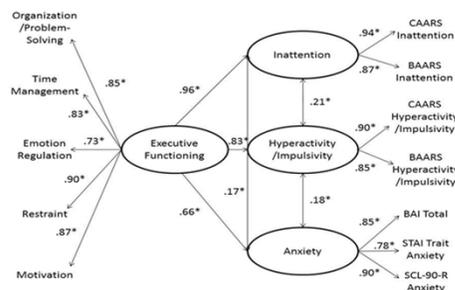
## MTA Study Comorbidity Map



## Executive Functioning as Transdiagnostic?

- Growing interest in "transdiagnostic" mechanisms
  - Comorbidity patterns suggest that there are mechanisms that cut across different disorders
- Executive functioning
  - Higher level brain functions thought to be associated with the prefrontal cortex of the brain
- Executive functioning is associated with a range of psychiatric disorders even after controlling for ADHD
  - EF and depression (Luciana, 2016)
  - EF and anxiety (Eysenck, Derakshan, Santos, & Calvo, 2007; Jarrett, 2015)
  - EF and ODD/CD (Hobson & Rubia, 2011)
  - Hot and cool executive functioning

## Jarrett (2015)



## National Institute of Mental Health Research Domain Criteria (RDoC)

- ▣ <http://www.nimh.nih.gov/research-priorities/rdoc/research-domain-criteria-matrix.shtml>
- ▣ Psychiatric problems to be defined by these underlying processes rather than through typical DSM categories such as ADHD, anxiety disorders, etc.
- ▣ RDoC domains relevant to executive functioning
  - ▣ Cognitive (effortful) control such as inhibition
  - ▣ Working Memory
    - ▣ One of the strongest executive functioning deficits associated with ADHD

## Executive Functioning as Transdiagnostic

- ▣ Questions?

## Treatments for ADHD and Executive Functioning

- ▣ Three well-established treatments for ADHD (Evans, Owens, & Bunford, 2013)
  - ▣ Stimulant medication
  - ▣ Behavioral management interventions at home and at school
  - ▣ Organizational skills training
- ▣ Possibly efficacious
  - ▣ Neurofeedback
- ▣ Experimental
  - ▣ Cognitive training

## ADHD Treatment Challenges

- ▣ Interventions work when applied but children return to pre-treatment levels of functioning when interventions are removed
- ▣ Limited evidence for long-term gains from treatment
- ▣ Why?
  - ▣ Our current treatments do not sufficiently address brain-based deficits
    - ▣ Stimulants do to some extent but less for areas associated with executive functioning (e.g., prefrontal cortex; Spencer et al., 2013)
  - ▣ ADHD increasingly recognized as a neurodevelopmental disorder (i.e., DSM-5 categorization)
    - ▣ How can we make more enduring changes in brain structure and function?

## Brain Development Influences

- ▣ Shaw et al. (2007)
  - ▣ <http://www.youtube.com/watch?v=-.YRFZpJiWF4&feature=channel>
- ▣ Children with ADHD were on average 3 years behind controls
- ▣ Some evidence for children catching up though
  - ▣ Fits with the decline in ADHD that we see in adolescence and young adulthood
- ▣ Importance of thinking about ADHD as neurodevelopmental with varying trajectories

## Executive Functioning Interventions

- Diamond & Lee (2012)
- Treatments for children ages 4 to 12 shown to enhance executive functioning
  - ▣ Computerized training (e.g., Cogmed)
  - ▣ Computer and noncomputer games
  - ▣ Aerobic exercise
  - ▣ Martial arts such as Taekwondo
  - ▣ Mindfulness practices
  - ▣ Classroom curricula (PATHS)

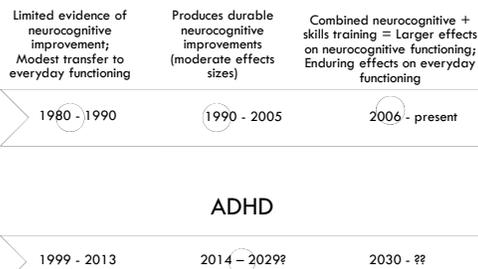
## Limitations of Cognitive Training

- Limited evidence of “far transfer” to date
- Targets are misspecified
  - ▣ Training short-term memory rather than working memory (Cogmed)
  - ▣ <https://www.youtube.com/watch?v=MRmqTNGOV0c>
- New study examining C8 Sciences/ACTIVATE intervention for ADHD
  - ▣ Collaborating with colleague at NYU (Anil Chacko)
  - ▣ Activities target a range of neurocognitive functions simultaneously and are more interactive and child-friendly
    - Intervention also includes physical exercises but not evaluating now
  - ▣ <http://www.c8sciences.com/about/games/>

## Cognitive Training Potential

- Much of this work is in its infancy in relation to ADHD
- Cognitive training for schizophrenia as an example
- Neurocognitive training for schizophrenia took years to develop but now showing good evidence
- In RCTs comparing computerized neurocognitive treatment, skills based treatment (vocational and social skills training), and combined neurocognitive and skills treatment, **combined treatment lead to greater improvements in neurocognitive outcomes and functional outcomes which maintained over time** (Bowie et al., 2012)
- Combined skills training and neurocognitive treatment for ADHD (Chacko, Kofler, & Jarrett, 2014; *Clinical Child and Family Psychology Review*)

## Schizophrenia



## Future Interventions (Diamond & Lee, 2012)

- "The best approaches to improving EFs and school outcomes will probably be those that (a) engage students' passionate interests, bringing them joy and pride, (b) address stresses in students' lives, attempting to resolve external causes and strengthen calmer, healthier responses, (c) have students vigorously exercise, and (d) give students a sense of belonging and social acceptance, in addition to giving students opportunities to repeatedly practice EFs at progressively more-advanced levels."

## Lakes & Hoyt (2004) - Taekwondo

- 200 children in 1<sup>st</sup> through 5<sup>th</sup> grade randomized to Taekwondo or standard physical education for 3 months
- Greater benefits for Taekwondo on:
  - ▣ Prosocial behavior ( $d = .29$ )
  - ▣ Classroom conduct ( $d = .23$ )
  - ▣ WISC-III Arithmetic ( $d = .34$ )
  - ▣ Blind ratings of cognitive ( $d = .49$ ) and affective regulation ( $d = .42$ ) on a physical challenge task
  - ▣ Even more pronounced for boys ( $ds = .42-.8$ )

## Grant to NCCIH

- National Center for Complementary and Integrative Health
  - Interested in mind-body interventions and complementary treatments for disorders such as ADHD (<https://nccih.nih.gov/health/providers/digest/adhd>)
  - Examples of funded studies include yoga, mindfulness, etc.
- Plan is to randomize children to either Taekwondo mixed with physical education or physical education alone
  - Will manualize a school-based Tiger-Rock curriculum
  - Measures of EF, mental and physical health, academic functioning, and peer functioning at pre, 3 months after treatment, and 6 months after treatment

## Interventions for Executive Functioning

- Questions?

## Organizational Skills Interventions

- Considered a “well-established” intervention for children with ADHD
- Should consider this with kids with ADHD who actually have organizational skills deficits (not all kids with ADHD do)
- Two evidence-based protocols that are now commercially available
- Organizational Skills Training for Children with ADHD
  - Designed for grades 3 to 5
- Homework, Organization, and Planning Skills (HOPS) Interventions
  - Designed for grades 6 to 8

## Other Resources for Executive Functioning

- Smart but Scattered
  - Designed for parents of school-age kids
- Smart but Scattered Teens
  - Designed for parents of teens
- The Smart but Scattered Guide to Success
  - Designed for adults
- Executive Skills in Children and Adolescents
  - Designed for school-based clinicians and educators

## Final Thoughts

- Interventions for executive functioning have significant potential but many are still in experimental stages
- Some of these are low cost and low risk (e.g., physical exercise, mindfulness practices)
- Others are very expensive for families and schools
  - Cognitive training
- Many claims for efficacy are unfounded and are starting to get regulated
  - <http://www.bloomberg.com/news/articles/2015-01-22/jungle-rangers-game-maker-agrees-to-cease-adhd-treatment-claims>