

## RANDOMIZED CONTROLLED TRIAL OF GROUP DBT SKILLS AND MINDFULNESS TRAINING FOR ADHD AMONG COLLEGE STUDENTS

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## INTRODUCTION

### DIAGNOSTIC CRITERIA

- ADHD behavioral criteria
  - Inattention (poor attention regulation)
  - Hyperactivity/impulsivity
- Childhood onset
- Functional impairment



2

American Psychiatric Association, 2000

## INTRODUCTION

### PREVALENCE



Children  
~8%



College & Adult  
~5%

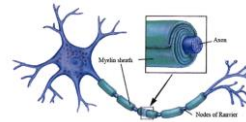
3

DuPaul et al., 2009

## DEVELOPMENTAL CONTEXT

### SELF-REGULATION

- Self-regulation in emerging adults (18-24)



- Ongoing myelination of DLPFC until ~25

4

Giedd, 2004; Huizinga et al., 2006; Liston et al., 2006; Steinberg et al., 2009

## DEVELOPMENTAL CONTEXT

### SELF-REGULATION

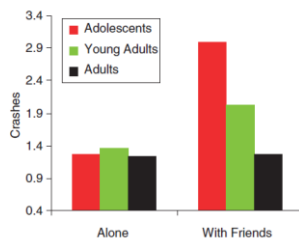


Fig. 2. Risk taking of adolescents, young adults, and adults during a video driving game, when playing alone and when playing with friends. Adapted from Gardner & Steinberg (2004).

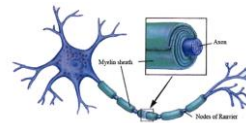
5

Gardner &amp; Steinberg, 2005; Steinberg, 2007

## DEVELOPMENTAL CONTEXT

### SELF-REGULATION

- Self-regulation in emerging adults (18-24)



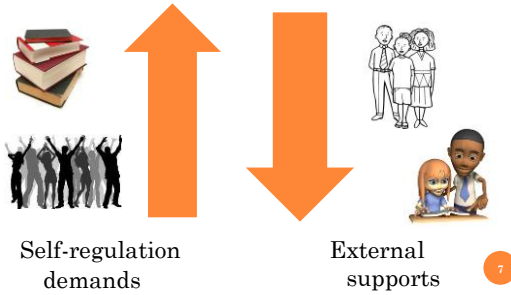
- Ongoing myelination of DLPFC until ~25
- Socio-emotional vulnerability
- “Double-deficit” in self-regulation

6

Fleming &amp; McMahon, 2012; Giedd, 2004; Huizinga et al., 2006; Liston et al., 2006; Steinberg et al., 2009

## INTRODUCTION

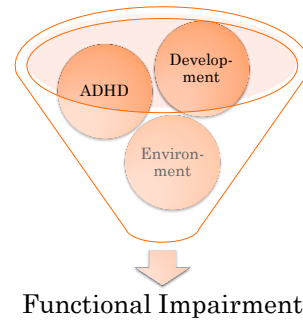
### ENVIRONMENTAL CONTEXT OF COLLEGE



7

## INTRODUCTION

### FUNCTIONAL IMPAIRMENT IN COLLEGE



8

## INTRODUCTION

### FUNCTIONAL IMPAIRMENT IN COLLEGE

- Academic
- Psychological
- Social
- Occupational
- Driving

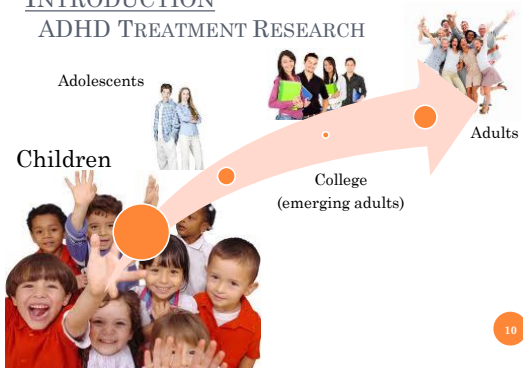


9

e.g., Barkley et al., 2002; Blase et al., 2009; Frazier et al., 2007; Rooney et al., 2001; Shifrin et al., 2010

## INTRODUCTION

### ADHD TREATMENT RESEARCH



10

## INTRODUCTION

### TREATMENT RESEARCH —COLLEGE

- Medication with adults
  - Reduces core symptoms & impairment
- Medication with college students
  - One brief controlled trial (Vyvanse)
- Concerns regarding medication:
  - Nonresponse and residual impairment
  - Medication adherence

11

DuPaul et al., 2012; Meaux et al., 2006, 2009; Rabiner et al., 2008; Wilens et al., 1998, 2002

## INTRODUCTION

### TREATMENT RESEARCH —ADULTS

Treatment	Hrs	vs. Control <i>d</i>	Response Rates	
			Treatment	Control
Individual CBT	12	0.53-0.60	53-67%	23-33%
Group CBT	24	0.46-0.67	42-53%	12-28%
Group Mndfl.	20	---	30%	---
Group DBT/Mndfl.	26	(0.70)	---	---

12

Philipsen et al., 2007; Safren et al., 2010; Solanto et al., 2010; Tang et al., 2007; Zylowska et al., 2008

## INTRODUCTION

### SPECIFIC AIMS

- Treatment development approach:
  - Adapt intervention principles that show efficacy with adults and adolescents with ADHD...
  - ... to the developmental and environmental context of college...
  - ... and see if it works.

13

## METHOD

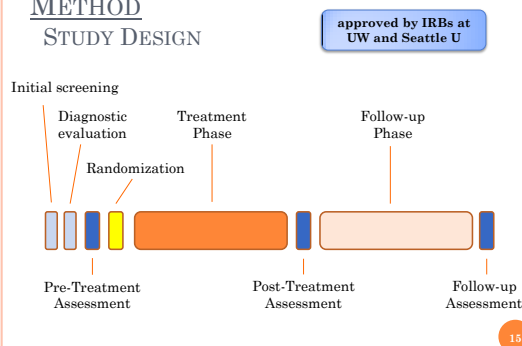
### RECRUITMENT

- University of Washington, Seattle Pacific University, and Seattle University
- Offices providing student services
  - Student disability services offices (e.g., DRS)
  - Student health centers (e.g., Hall Health)
  - Counseling centers
- Email, flyers, brochures

14

## METHOD

### STUDY DESIGN



15

## METHOD

### INCLUSION CRITERIA

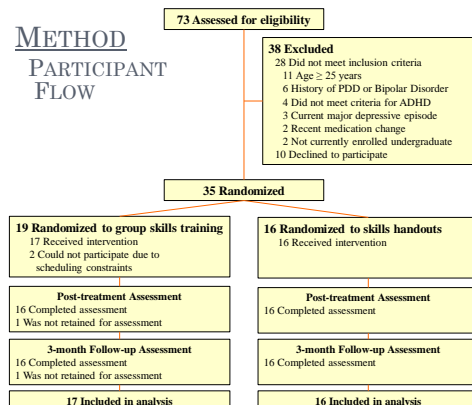
- Currently enrolled undergraduate
- Age 18-24
- Meet revised DSM-IV-TR criteria for ADHD (PI or combined type)
  - At least 4 inattentive symptoms
  - Functional impairment (2+ domains)
  - Childhood onset (by age 12)
- Willingness to be randomly assigned and participate in either treatment

16

Barkley, 2011

## METHOD

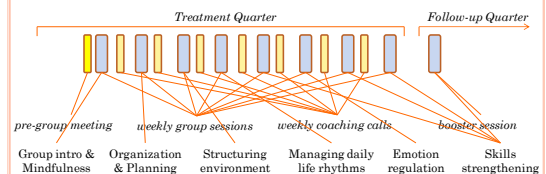
### PARTICIPANT FLOW



17

## METHOD

### TREATMENTS: GROUP CBT SKILLS TRAINING



- DBT skills training format
- Group leader & co-leader
- Supervisor & DBT consultation team

18

Linehan 1993, Safren et al., 2010, Solanto et al., 2010

## METHOD

### TREATMENTS: GROUP CBT SKILLS TRAINING

#### Session format:

- 10 Opening mindfulness practice & discussion
- 5 Skills teaching review
- 30 Homework review with diary card
- 5 Midpoint mindfulness practice
- 35 New skills teaching & practice
- 3 Assign homework practice
- 2 Closing mindfulness

#### Coaching calls:

Motivation, skills generalization, feedback

19

ADHD Skills Group Diary Card		Initials: _____ ID #: _____	How often did you record? ____ Daily ____ 2-3x 4-6x Once	Date started: ____ / ____ / ____								
Day of Week	SLEEP (hrs)	THREAT (what?)	EAT ✓	EXERCISE mins.	Med. as Rx'd	Alcohol #	Cab- ene #	Other drugs #	Planner am: n: pm	ENVIR. D.S.	FOCUS D.S.	SKILL D.S.
TUE												
WED												
THU												
FRI												
SAT												
SUN												
MON												

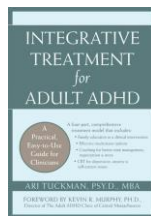
20

## METHOD

### TREATMENTS: SKILLS HANDOUTS

#### Self-guided skills handouts

- Psychoeducation
- Organization & planning
- Structuring environment
- Time management
- Emotion regulation & stress management



21

Tuckman, 2007

## RESULTS & DISCUSSION

### SAMPLE CHARACTERISTICS

- $N = 33$
- Age:  $M = 21.3$  (range 18-24)
- 42% female
- Race:
  - 58% White, 15% Latino, 6% Asian, 3% Black, 18% Multi-racial/Other
- 73% public university
- Verbal IQ:  $M = 110$  (range: 82-147)

22

## RESULTS & DISCUSSION

### SAMPLE CHARACTERISTICS

#### ADHD subtype

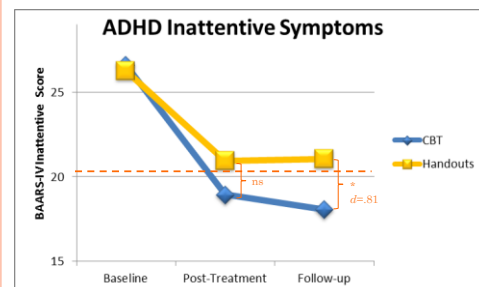
- 30% ADHD inattentive (revised)
- 55% ADHD inattentive (full DSM-IV-TR)
- 15% ADHD combined (full DSM-IV-TR)

#### Psychiatric medication status

- 64% stimulant only
- 9% stimulant + SSRI
- 3% SSRI only
- 24% no medication

23

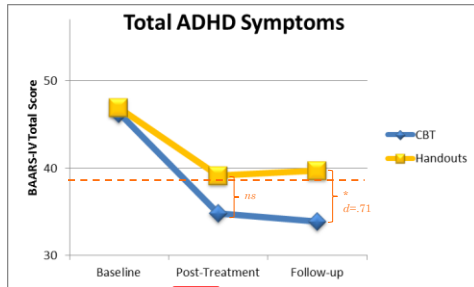
### #1: EFFICACY—ADHD SYMPTOMS



RM ANOVA:  $F(2, 62) = 3.13$ ,  $p = .05$ ,  $\eta^2 = .092$   
 post:  $F(1, 31) = 2.25$ ,  $p = .14$ ,  $d = .35$   
 follow-up:  $F(1, 31) = 5.82$ ,  $p = .02$ ,  $d = .81$

24

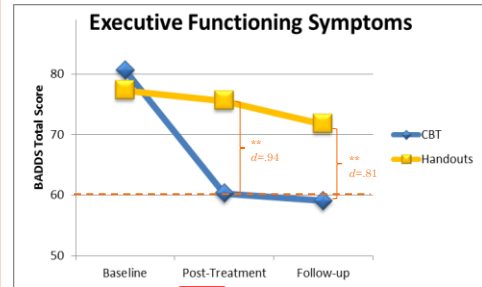
## #1: EFFICACY—ADHD SYMPTOMS



RM ANOVA:  $F(2, 62) = 3.18, p = .053, \text{partial } \eta^2 = .093$   
 post:  $F(1, 31) = 2.41, p = .126, d = .47$   
 follow-up:  $F(1, 31) = 6.09, p = .018, d = .71$

25

## #1: EFFICACY—EXECUTIVE FUNCTIONING

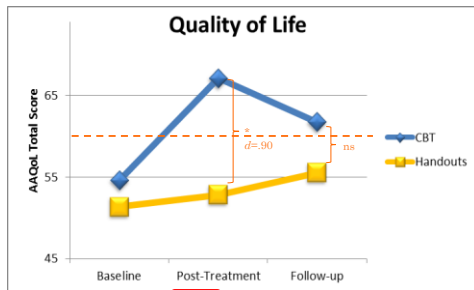


RM ANOVA:  $F(2, 62) = 5.46, p = .007, \text{partial } \eta^2 = .150$   
 post:  $F(1, 31) = 9.85, p = .004, d = .94$   
 follow-up:  $F(1, 31) = 7.61, p = .01, d = .81$

Biederman et al., 2006

26

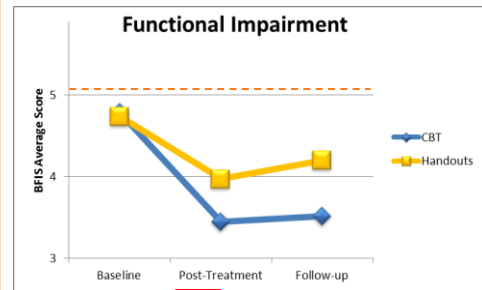
## #1: EFFICACY—QUALITY OF LIFE



RM ANOVA:  $F(2, 62) = 3.47, p = .038, \text{partial } \eta^2 = .101$   
 post:  $F(1, 31) = 6.63, p = .016, d = .90$   
 follow-up:  $F(1, 31) = .423, p = .52, d = .21$

27

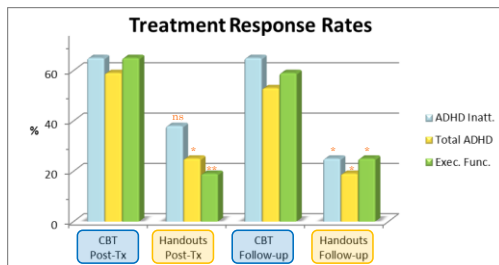
## #1: EFFICACY—FUNCTIONAL IMPAIRMENT



RM ANOVA:  $F(2, 62) = 1.91, p = .16, \text{partial } \eta^2 = .059$   
 post:  $F(1, 31) = 6.63, p = .016, d = .37$   
 follow-up:  $F(1, 31) = 7.61, p = .01, d = .49$

28

## #1: EFFICACY—TREATMENT RESPONSE

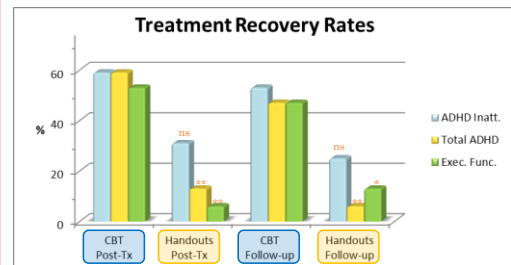


POST-TREATMENT:  
 ADHD Inatt.:  $\chi^2(1) = 2.44, p = .12$   
 Total ADHD:  $\chi^2(1) = 3.86, p = .049$   
 Exec. Func.:  $\chi^2(1) = 7.13, p = .008$

FOLLOW-UP:  
 ADHD Inatt.:  $\chi^2(1) = 5.24, p = .02$   
 Total ADHD:  $\chi^2(1) = 4.16, p = .041$   
 Exec. Func.:  $\chi^2(1) = 3.86, p = .049$

29

## #1: EFFICACY—TREATMENT RECOVERY

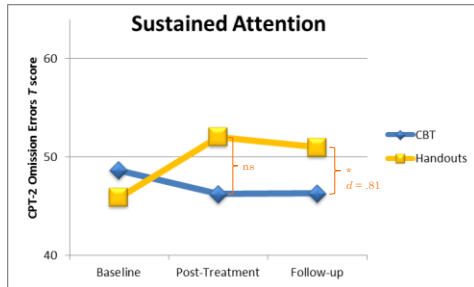


POST-TREATMENT:  
 ADHD Inatt.:  $\chi^2(1) = 2.53, p = .11$   
 Total ADHD:  $\chi^2(1) = 7.64, p = .006$   
 Exec. Func.:  $\chi^2(1) = 8.51, p = .004$

FOLLOW-UP:  
 ADHD Inatt.:  $\chi^2(1) = 2.70, p = .10$   
 Total ADHD:  $\chi^2(1) = 6.92, p = .009$   
 Exec. Func.:  $\chi^2(1) = 3.66, p = .03$

30

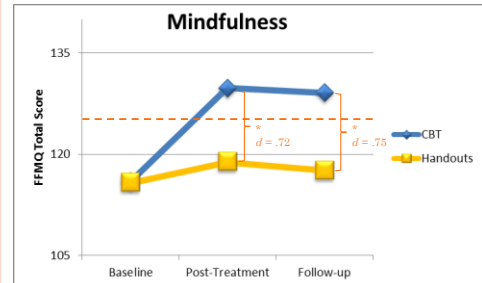
## #1: EFFICACY—NEUROPSYCH. PERFORMANCE



RM ANOVA:  $F(2, 60) = 3.09, p = .066, \eta^2 = .093$   
 post:  $F(1, 30) = 3.50, p = .071, d = .74$   
 follow-up:  $F(1, 30) = 4.50, p = .043, d = .81$

31

## #1: EFFICACY—MINDFULNESS



RM ANOVA:  $F(2, 62) = 4.19, p = .031, \eta^2 = .118$   
 post:  $F(1, 31) = 4.28, p = .044, d = .72$   
 follow-up:  $F(1, 31) = 6.70, p = .023, d = .75$

32

## RESULTS & DISCUSSION

### SPECIFIC AIM #1: EFFICACY

Treatment	Hrs	vs. Control		Response Rates	
		Hrs	d	Treatment	Control
Individual CBT	12	0.53-0.60		53-67%	23-33%
Group CBT	12	0.46-0.67		42-53%	12-28%
Group Mndfl.	10	---		30%	---
Group DBT/Mndfl.	13	(0.70)		---	---
Group DBT/Mndfl.	8	0.55-0.94		59-65%	19-38%

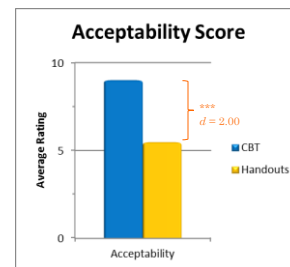
\*adjusted to individual intervention time

Philippen et al., 2007; Safren et al., 2010; Solanto et al., 2010; Zylowska et al., 2008

33

## RESULTS & DISCUSSION

### SPECIFIC AIM #2: ACCEPTABILITY



CBT vs. Handouts:  $t(30) = 5.59, p < .001, d = 2.00$

Group sessions attended:

88%

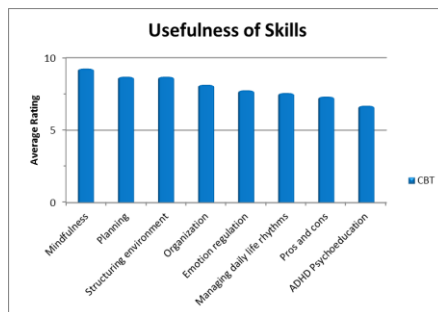
Group treatment dropout:

6%

34

## RESULTS & DISCUSSION

### SPECIFIC AIM #2: ACCEPTABILITY



35

## RESULTS & DISCUSSION

### SPECIFIC AIM #3: ACCEPTABILITY

#### Group skills training feedback:

"The mindfulness technique was priceless."

"The group activities and the weekly check-ins [helped]. Also the weekly calls helped a lot."

"Doing things mindfully has significantly improved my ability to focus during those activities and also in other related situations. ...Also, breaking down some of my issues and receiving support was helpful, as was public accountability."

"Definitely could have been at least a couple weeks longer."

"I just want to say thanks so much to Andrew, Lyndsey, and the rest of my group for being so fantastic and supportive. You are my ADHD family!!"

#### Skills handouts feedback:

"It was very informative. It helped me develop ways to manage."

"A pamphlet won't do anybody with ADHD good : / "

36

## RESULTS & DISCUSSION

### SPECIFIC AIM #4: FEASIBILITY

- Initial feasibility estimate
  - 6 participants per group
  - 3 hours weekly skills leader time vs.  
6 hours weekly individual therapist time
  - 50% resource load vs. individual CBT

37

## RESULTS & DISCUSSION

### STRENGTHS

- Internal validity
  - Randomized design
  - Blinded assessment
  - Intent-to-treat analyses
  - Low attrition rate (3%)
  - Conservative approach to missing data
- External validity
  - Treatment-seeking population
  - Diverse sample (e.g., race, college, ADHD severity)

38

## RESULTS & DISCUSSION

### LIMITATIONS

- Small sample size
- Lack of control for:
  - Nonspecific factors of psychotherapy
  - Therapist effects
- No semi-structured assessment with clinician global rating
- Inclusion of participants meeting revised DSM-IV-TR criteria

39

## RESULTS & DISCUSSION

### FUTURE DIRECTIONS

- Stage II efficacy trial (single- or multi-site)
  - Powered for moderate effect sizes
  - Time-matched control
  - Larger group sizes
  - Therapist training
  - Broader assessment battery
- Component analysis

40

## RESULTS & DISCUSSION

### CONCLUSIONS

- Preliminary evidence of:
  - Efficacy
    - Executive functioning
    - Quality of Life
    - ADHD symptoms } \*trend
    - Mindfulness } \*exploratory
    - Sustained attention
  - Acceptability
  - Feasibility
- Support for larger randomized trial

41

## ACKNOWLEDGMENTS

- Bob McMahon & labmates
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- Laura Knouse, Ari Tuckman
- Lyndsey Moran
- Paige, Meagan, Joseph, & Anthony

42