Behavioral Interventions for Anxiety and Irritability in Children and Adolescents with Autism Spectrum Disorder

Denis G. Sukhodolsky, Ph.D.

Yale Child Study Center

Yale Child Study Center

FROM GENERATION TO GENERATION

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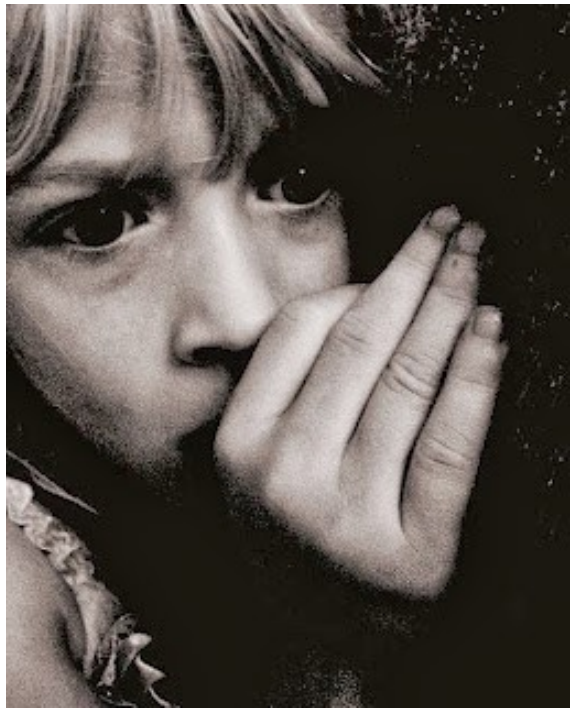
Autism Spectrum Disorder (ASD)

- Core symptoms
  - Impairment in social interaction and communication
  - Restricted interests and repetitive behavior

- Associated features
  - Cognitive impairment
  - Deficits in adaptive functioning
  - Anxiety
  - Disruptive behavior problems

Anxiety in ASD

- Excessive fearfulness
- Changes in routines and social situations
- Can be related to core ASD symptoms
- Co-occurring anxiety disorders may be present
- Social anxiety may be difficult to diagnose
- Contributes to impairment in functioning



Cognitive-Behavior Therapy for Anxiety

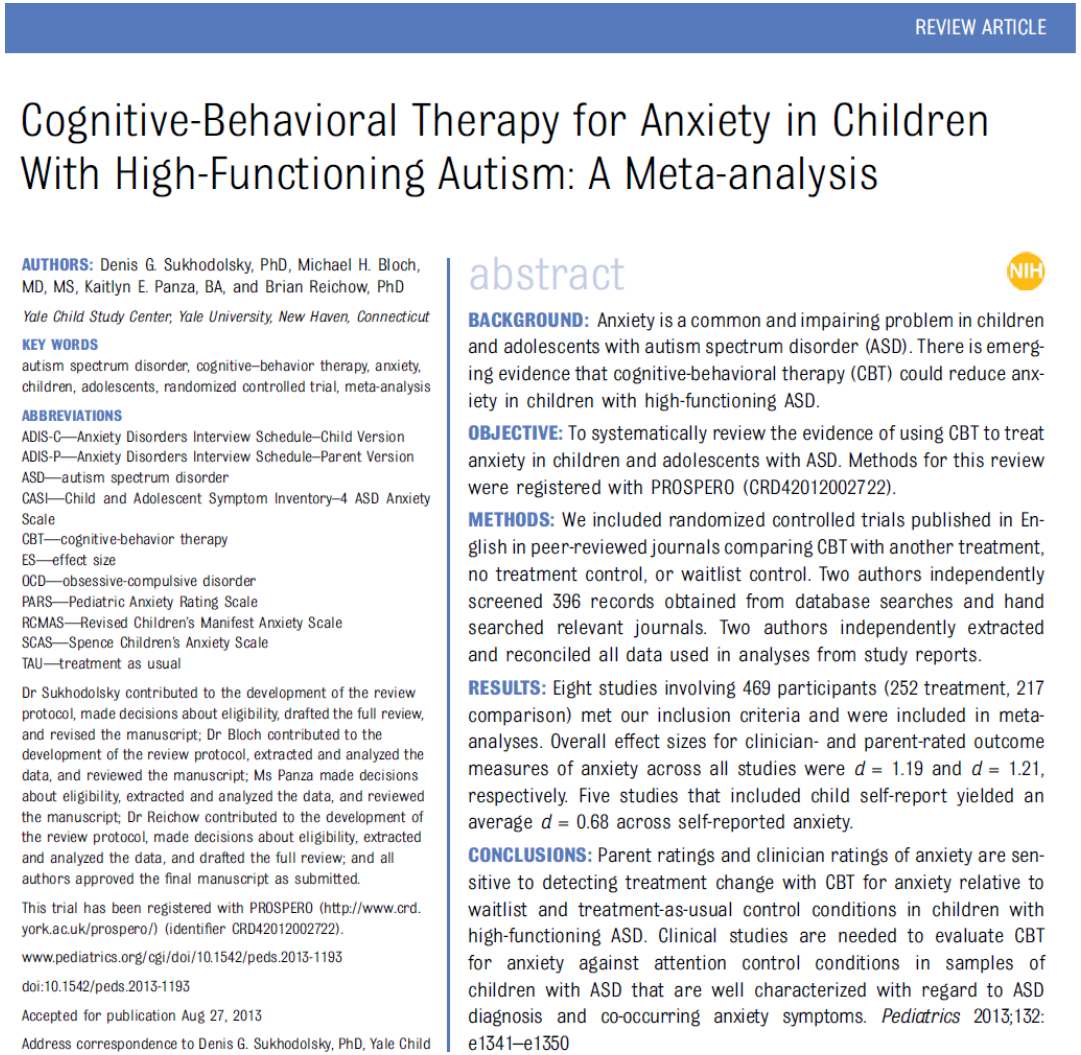
CBT is a well-established intervention for anxiety in children without autism.

Key components: education, emotion regulation, and exposure and response prevention.

Short-term duration, 8 to 16 weekly sessions.

Treatment is conducted with the child and includes parent involvement.

Is CBT helpful for anxiety in ASD?



REVIEW ARTICLE

Cognitive-Behavioral Therapy for Anxiety in Children With High-Functioning Autism: A Meta-analysis

AUTHORS: Denis G. Sukhodolsky, PhD, Michael H. Bloch, MD, MS, Kaitlyn E. Panza, BA, and Brian Reichow, PhD

Yale Child Study Center, Yale University, New Haven, Connecticut

KEY WORDS

autism spectrum disorder, cognitive–behavior therapy, anxiety, children, adolescents, randomized controlled trial, meta-analysis

ABBREVIATIONS

ADIS-C—Anxiety Disorders Interview Schedule–Child Version
ADIS-P—Anxiety Disorders Interview Schedule–Parent Version
ASD—autism spectrum disorder
CASI—Child and Adolescent Symptom Inventory–4 ASD Anxiety Scale
CBT—cognitive-behavior therapy
ES—effect size
OCD—obsessive-compulsive disorder
PARS—Pediatric Anxiety Rating Scale
RCMAS—Revised Children's Manifest Anxiety Scale
SCAS—Spence Children's Anxiety Scale
TAU—treatment as usual

Dr Sukhodolsky contributed to the development of the review protocol, made decisions about eligibility, drafted the full review, and revised the manuscript; Dr Bloch contributed to the development of the review protocol, extracted and analyzed the data, and reviewed the manuscript; Ms Panza made decisions about eligibility, extracted and analyzed the data, and reviewed the manuscript; Dr Reichow contributed to the development of the review protocol, made decisions about eligibility, extracted and analyzed the data, and drafted the full review; and all authors approved the final manuscript as submitted.

This trial has been registered with PROSPERO (http://www.crd.york.ac.uk/prospero/) (identifier CRD42012002722).

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Address correspondence to Denis G. Sukhodolsky, PhD, Yale Child

abstract

BACKGROUND: Anxiety is a common and impairing problem in children and adolescents with autism spectrum disorder (ASD). There is emerging evidence that cognitive-behavioral therapy (CBT) could reduce anxiety in children with high-functioning ASD.

OBJECTIVE: To systematically review the evidence of using CBT to treat anxiety in children and adolescents with ASD. Methods for this review were registered with PROSPERO (CRD42012002722).

METHODS: We included randomized controlled trials published in English in peer-reviewed journals comparing CBT with another treatment, no treatment control, or waitlist control. Two authors independently screened 396 records obtained from database searches and hand searched relevant journals. Two authors independently extracted and reconciled all data used in analyses from study reports.

RESULTS: Eight studies involving 469 participants (252 treatment, 217 comparison) met our inclusion criteria and were included in meta-analyses. Overall effect sizes for clinician- and parent-rated outcome measures of anxiety across all studies were $d = 1.19$ and $d = 1.21$, respectively. Five studies that included child self-report yielded an average $d = 0.68$ across self-reported anxiety.

CONCLUSIONS: Parent ratings and clinician ratings of anxiety are sensitive to detecting treatment change with CBT for anxiety relative to waitlist and treatment-as-usual control conditions in children with high-functioning ASD. Clinical studies are needed to evaluate CBT for anxiety against attention control conditions in samples of children with ASD that are well characterized with regard to ASD diagnosis and co-occurring anxiety symptoms. *Pediatrics* 2013;132: e1341–e1350

Main Findings:

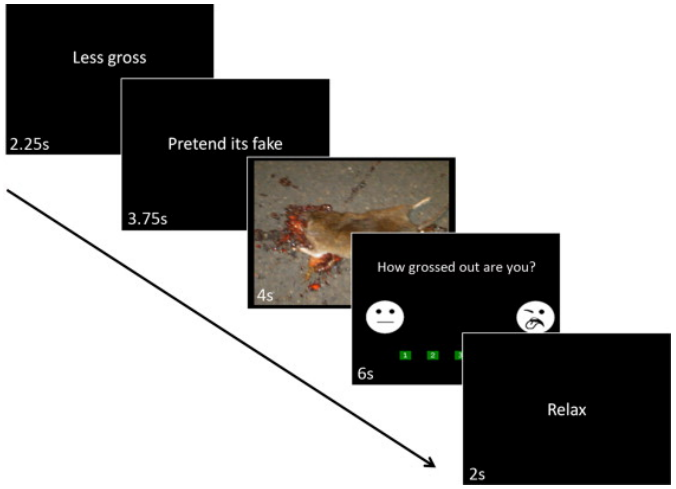
- 8 randomized controlled studies of CBT for anxiety were located.
- CBT was superior to waitlist on parent and clinician-rated anxiety.
- Effect sizes were 1.19 for parent ratings, 1.21 for clinician ratings and 0.68 for child self-report.

Sukhodolsky, Bloch, Panza, Reichow *Pediatrics,* 2013

Neural Mechanisms of CBT for anxiety in ASD

Subjects:

- 10 children with ASD and anxiety (3 girls, 7 boys),
- Age range from 10 to 13 years old
- Full Scale IQ ranged from 79 to 122
- Score ≥ 19 on the child symptom inventory anxiety scale
- 4 unmedicated and 6 on stable medication



Pitskel et al, Dev Cogn Neurosci, 2014

Treatment:

- 12-15 sessions of CBT for anxiety (Woods et al, 2009)

Outcomes:

- Clinician-rated Pediatric Anxiety Rating Scale (PARS)
- fMRI with emotion regulation and face perception tasks

Hariri et al, Neuroreport, 2000

Exposure and response prevention

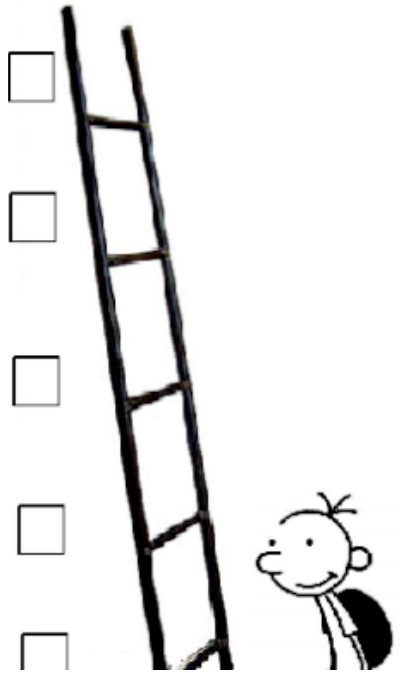
Social fears:

"Being rejected or offended in front of other children"

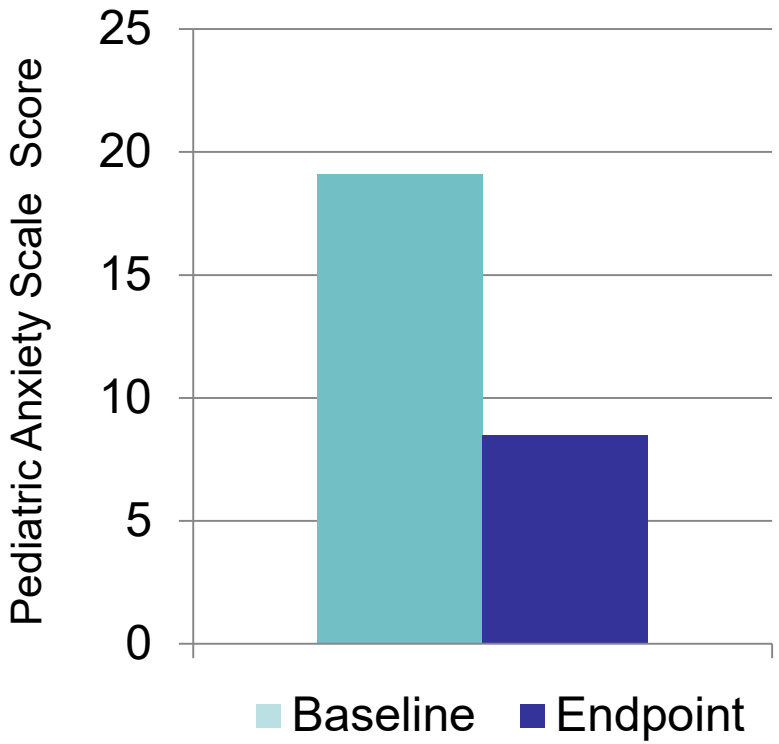
"I feel I will be embarrassed somehow…"

Exposure hierarchy:

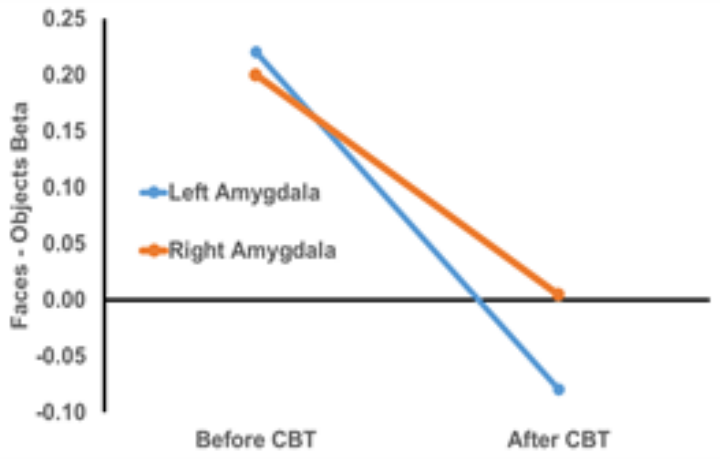
- Arrive to school 5 minutes before the first class.
- Say hi to one kid in the morning.
- Sit next to 7th grade children in the morning meeting.
- Participate in a group project at school.
- Spend at least 10 minutes in the lunch room.



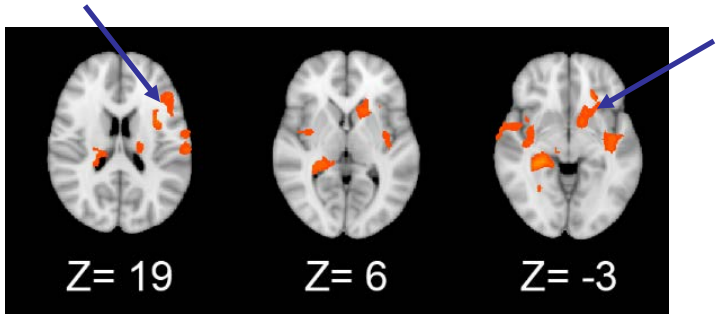
Biomarkers of CBT for anxiety in ASD



55% reduction in anxiety



a) Reduced amygdala activation to faces vs. objects

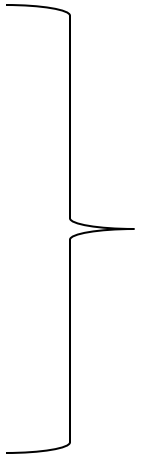


b) Increased activity in dorsolateral prefrontal cortex and anterior cingulate during emotion regulation

Unpublished pilot data, Sukhodolsky et al 2016

Disruptive behaviors in ASD

- Anger outbursts
- Tantrums
- Aggression
- Self-injury



Irritability

- Noncompliance

Impact of disruptive behavior

- Impairing in their own right
- Burden on family
- Interference with education
- Risk of injury
- Risk of property damage
- Derail development

Role of core ASD symptoms

- Rigidity *(frustrated by minor changes in routines)*
- Failure to recognize social context *(cursing at school principal)*
- Unusual triggers of frustration *(rule violation)*
- Communication *(perseverating on topics of no interest to others)*
- Deficits in social domain *(frustration with social situations)*
- Exaggerated nonverbal expressions (*loud voice*)

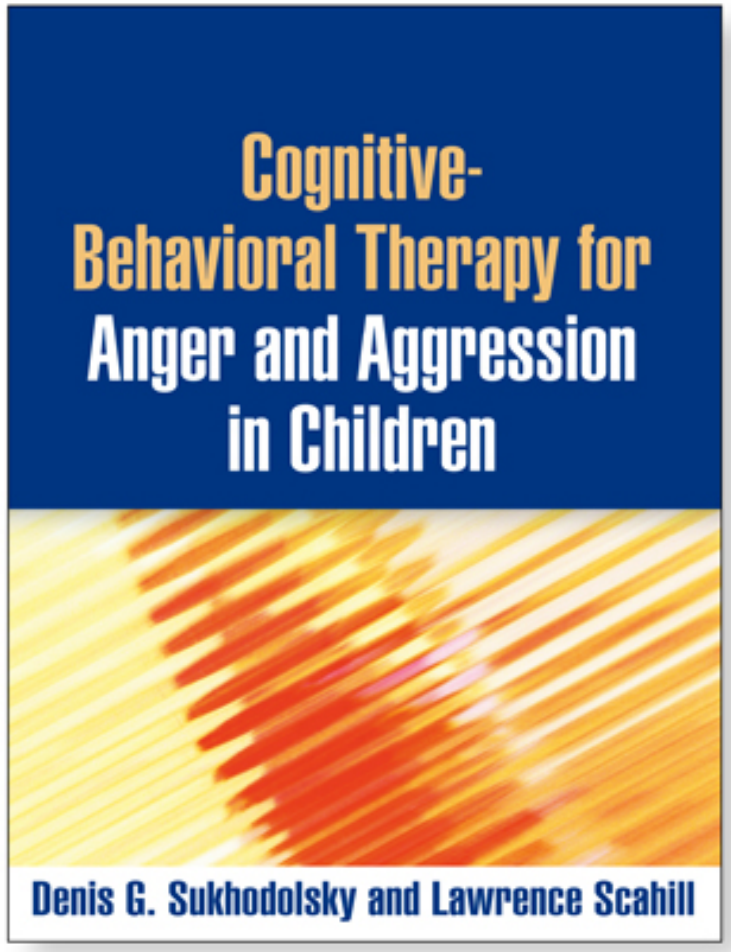
Primary treatment options for irritability

- Applied Behavior Analysis (ABA)
- Psychopharmacology
- Parent Management Training (PMT)

Irritability in adolescents with ASD

- Disruptive behavior is likely to persist in adolescence.
- Medication has side effects.
- Parent training and ABA programs don’t make use of the cognitive and communication skills of adolescents with higher-functioning ASD.
- Why not try CBT for typically developing children with disruptive behavior disorders?

CBT for irritability in typical development



Treatment format:

- 12 weekly sessions
- Dedicated parent component
- Optional school consultation

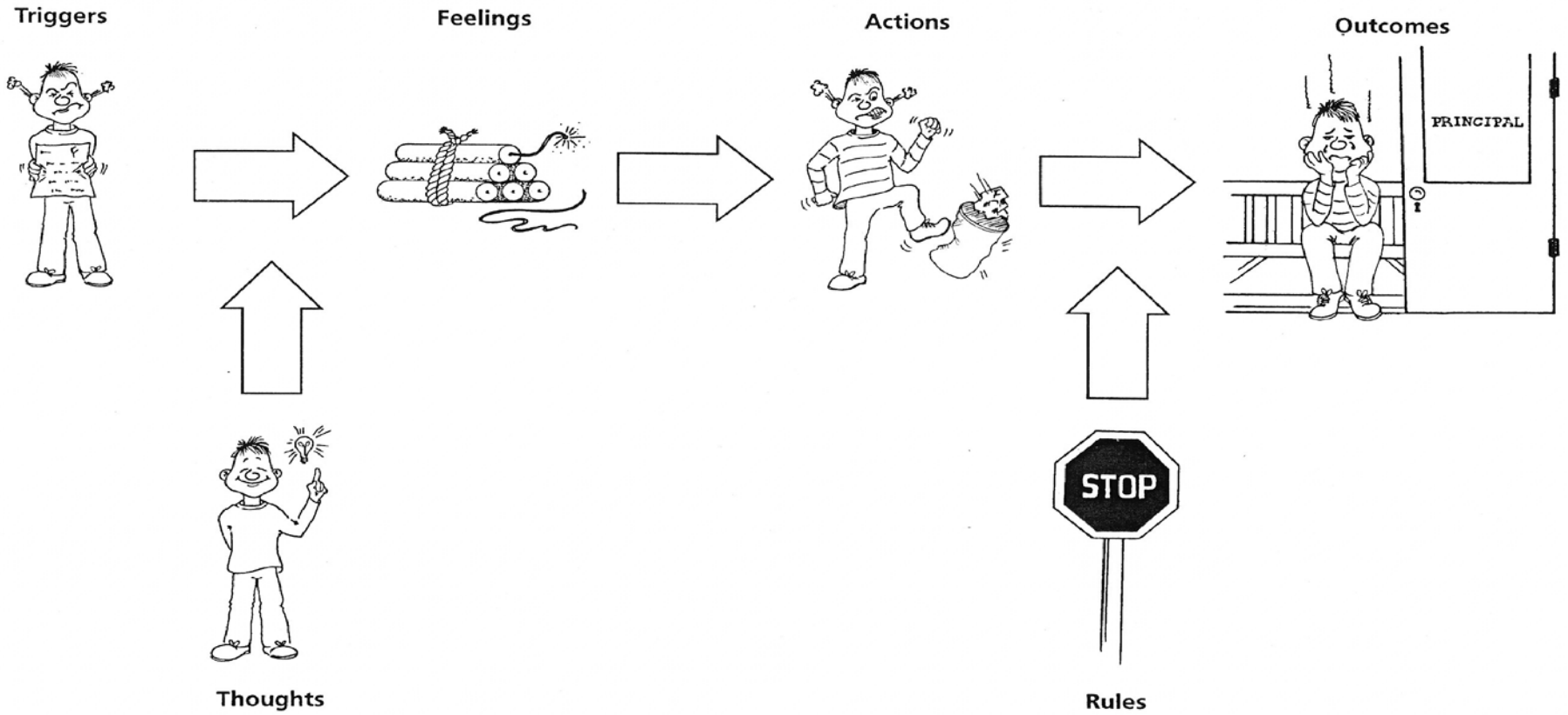
Treatment goals:

- To reduce frequency and intensity of anger outbursts and aggression
- To increase skills for managing frustration
- To improve social problem-solving

Education about anger episode

HANDOUT 1

Elements of an Anger Episode



Identify triggers of anger

HANDOUT 2

Anger Triggers

Common Anger Triggers

Your Anger Triggers

1. _____

2. _____

3. _____

4. _____

5. _____

Use calming thoughts

One child in our program reported that a kid in his music class was throwing paper clips at him when the teacher was not looking, and he made a list of thoughts that went through his mind:

- *I'm gonna punch him in the face*
- *Human nature is driving me crazy*
- *It's not worth getting all worked up about* ✓
- *He is an idiot; I don't need to stoop to his level*

Parent training

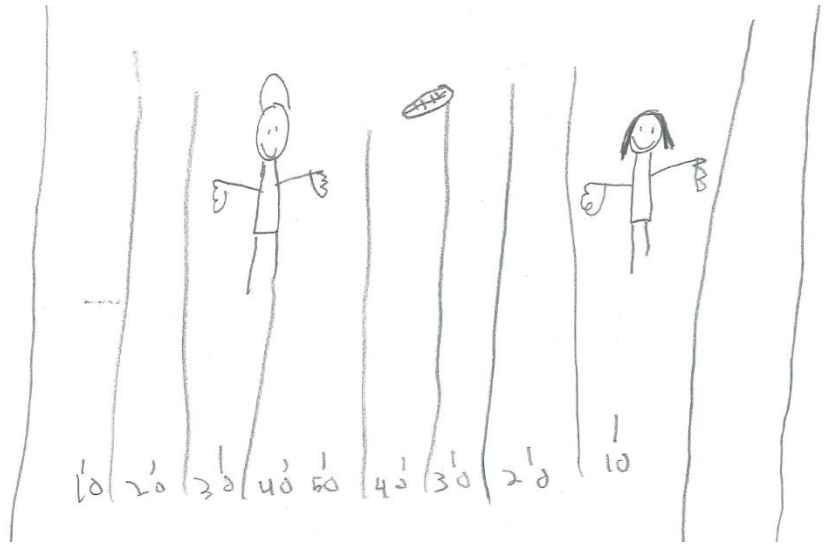
Core principles:

- The ABC of behavior
- Differential attention
- Effective commands
- Praise and rewards
- Daily routines

Patterson, Reid, Dishion (1992)

Rewards

- Look for positive opposites
- “Catch them being good”
- Enjoyable interaction
- Child guided play
- Verbal praise
- Nonverbal praise
- Sticker charts
- Token economies



Behavior therapy for irritability in ASD

Subjects:

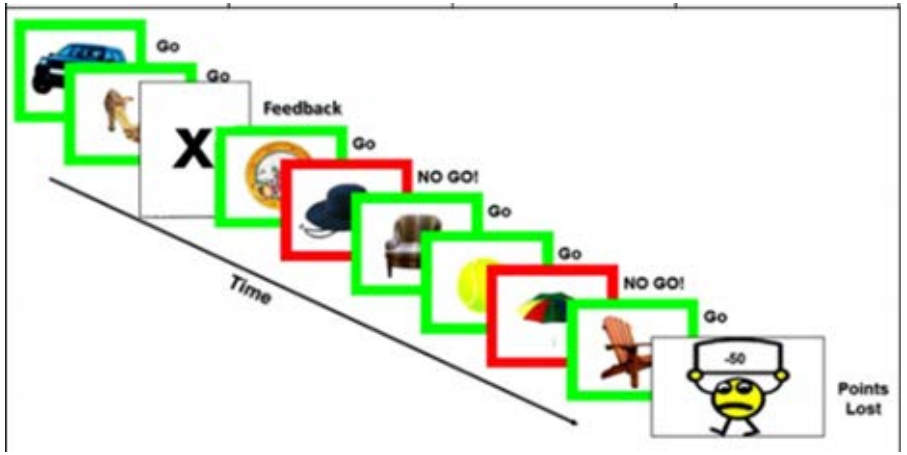
- 9 adolescents (1 girl, 8 boys),
- Age range 11 to 16 years old
- Full Scale IQ ranged from 80 to 112, mean 95
- Score ≥ 16 on irritability scale of Aberrant Behavior Checklist
- 2 unmedicated and 7 on stable medication

Treatment:

12-15 sessions of CBT for irritability

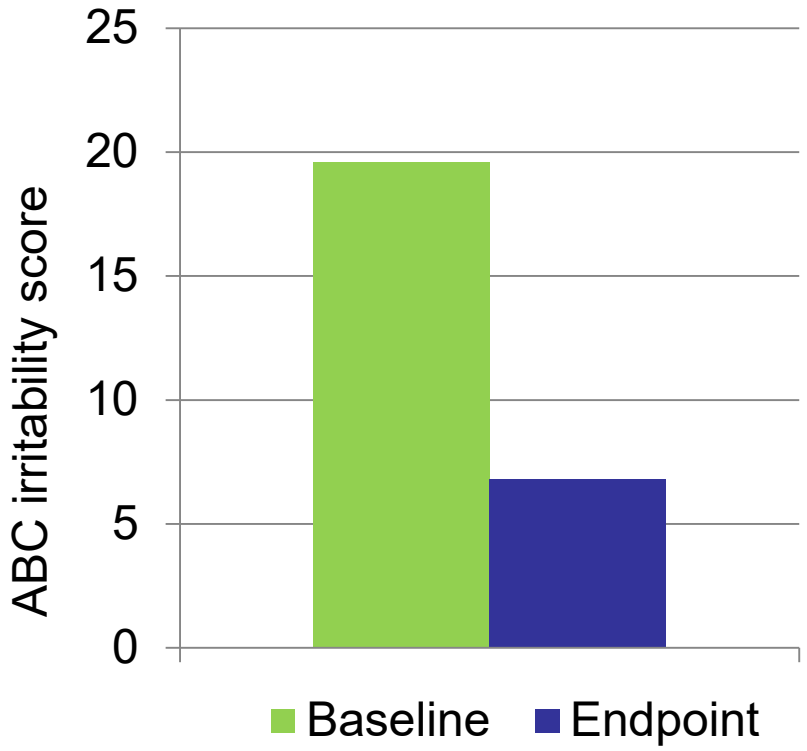
Outcomes:

- Parent-rated ABC irritability scale
- fMRI with frustration-induction GoNoGo task

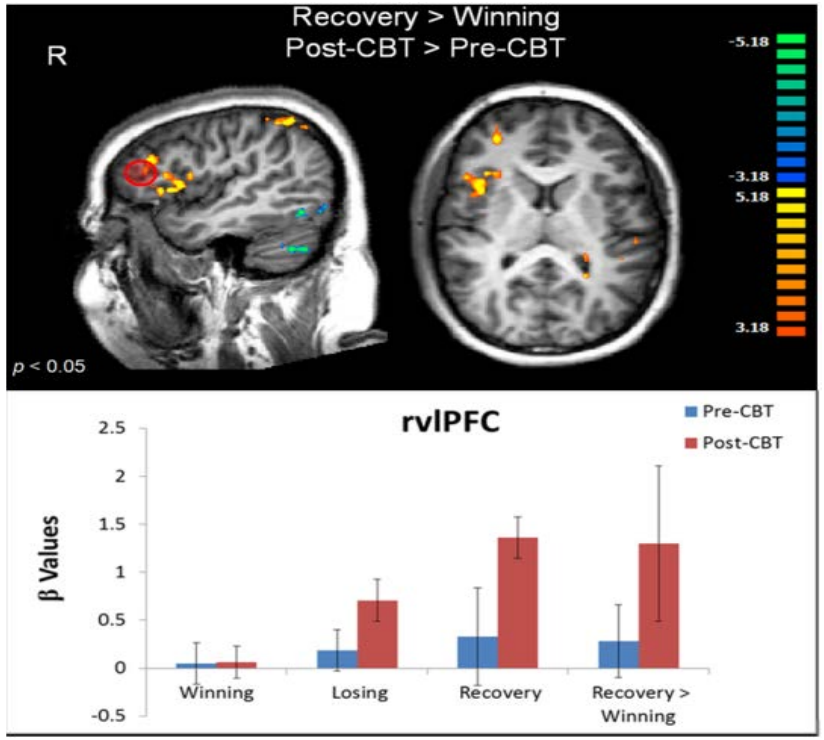


Perlman & Pelphrey, 2010

Behavior therapy for irritability in ASD



65% reduction in ABC irritability score



Increase in prefrontal activity after CBT

Unpublished pilot data, Sukhodolsky et al 2016

RDoC study of CBT for aggression/irritability

- Subjects are randomly assigned to 12 sessions of CBT or 12 sessions of Supportive Psychotherapy (SPT).
- Children perform neurocognitive tasks of emotion regulation and face perception during fMRI scanning and EEG recording at baseline and endpoint.
- Primary clinical outcomes are the Modified Overt Aggression Scale and the CGI-Improvement scale administered by an independent evaluator.

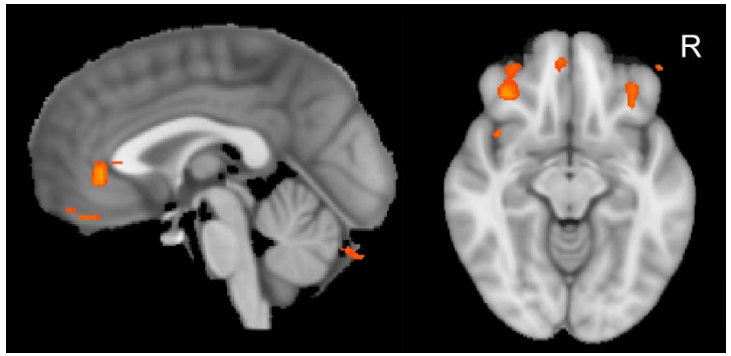
Sukhodolsky, Vander Wyk, …Pelphrey, JCAP, 2016

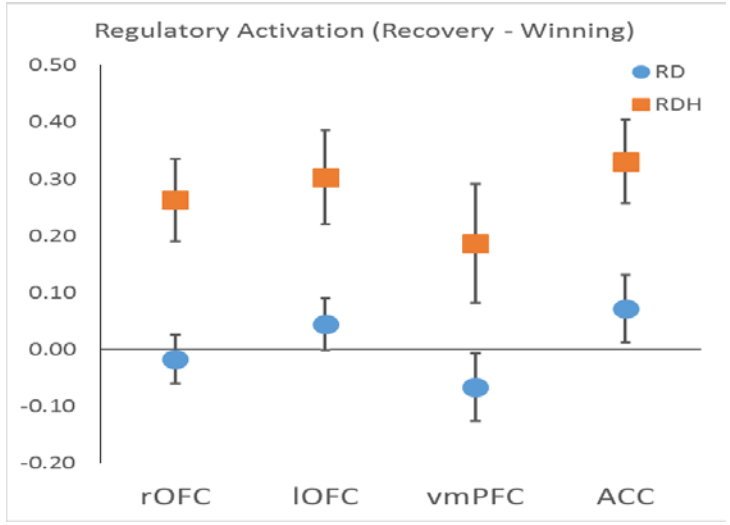
Frustration-induction GoNoGo

3 conditions: Winning – Losing – Recovery

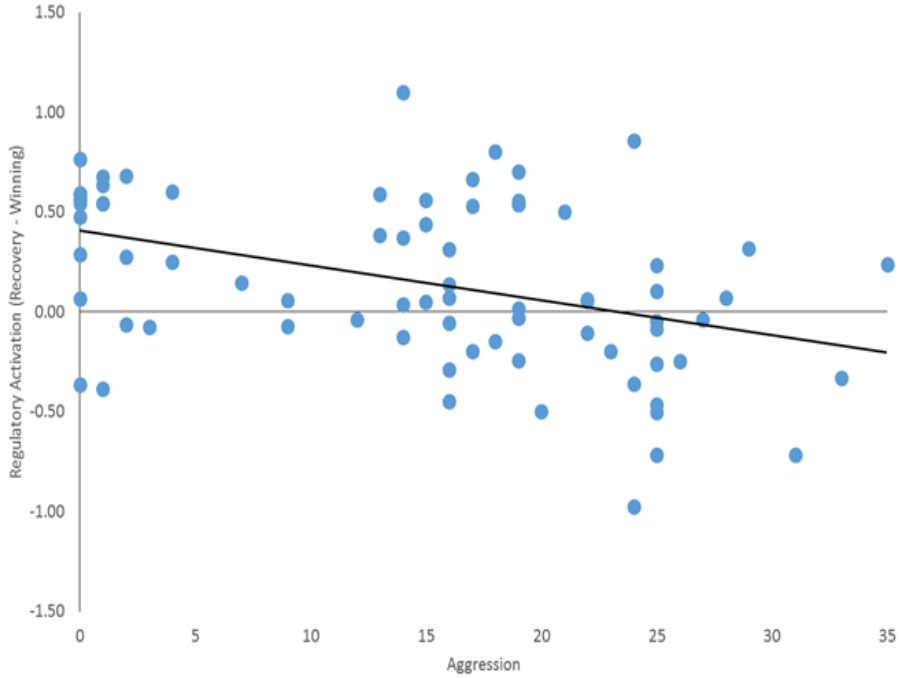
Adapted from Perlman & Pelphrey, 2010

Neural targets of behavior therapy for irritability





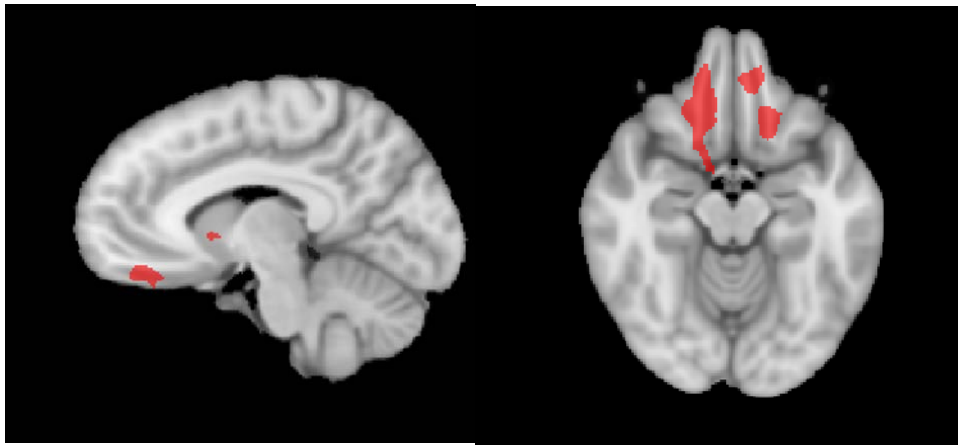
Reduced prefrontal activity in 50 children with aggressive behavior relative to 25 community controls without aggression

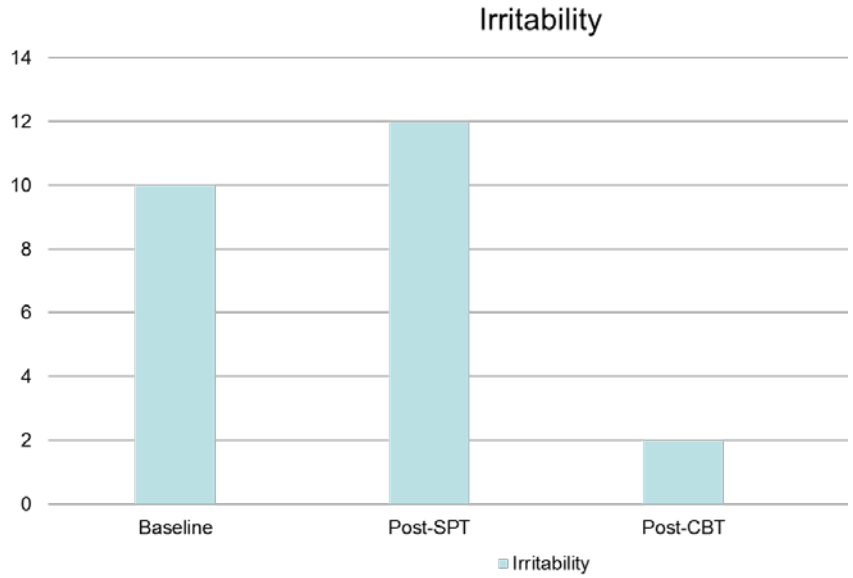


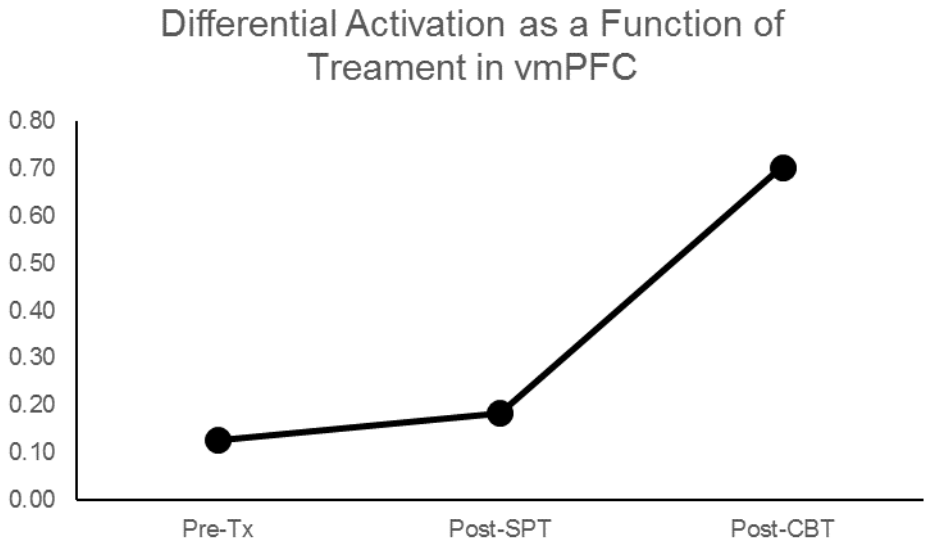
There is a negative correlation r = -0.37 of aggression with the ventromedial prefrontal cortex activation in the emotion-regulation contrast of the frustration-induction GoNoGo task.

Case illustration

Ruby, a 15 year-old girl with ASD, participated in a randomized trial of CBT for irritability. She presented with daily anger outbursts that lasted up to 10-15 minutes and with longer, multiple-hour outbursts 1-2 times per month. Anger was often triggered when routines were impeded or when another person disagreed with an idea that she found highly important. Specific behaviors included standing in one spot, tensing all her muscles, crying, screaming, and making verbal threats.







Modification of behavioral interventions for ASD

- Treatment is focused on target problems
- Flexible implementation
- Includes functional assessment
- Enhanced parent component
- Separate module to address unique social/ communication deficits and restricted interests
- School visit or telephone consultation

Summary

- Cognitive-behavioral therapy can be useful for anxiety in children with ASD.
- More work is needed to develop and test effective behavioral interventions for irritability in adolescents with ASD.
- Research Domain Criteria (RDoC) approach offers a valuable framework for studying common and unique characteristics of children with ASD relative to children with other forms of developmental psychopathology.
- Understanding the neural targets of CBT will enable improvement of existing treatments and the development of novel interventions for children with ASD.

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