Managing Problem Behavior in Children with Autism Spectrum Disorder

James Coplan, MD
Neurodevelopmental Pediatrics of the Main Line
www.drcoplan.com

Some “Problem Behaviors” in children with ASD

- Lack of initiative or persistence
- Inattention
- Hyperfocus
- Task Avoidance
- Noncompliance
- Verbal Aggression
- Physical Aggression
- Self-Injurious Behavior

Basic Premises

- Behaviors or internal states may be biologically driven, socially driven, or both

Disclosures

- Dr. Coplan is author of Making Sense of Autistic Spectrum Disorders: Create the brightest future for your child with the best treatment options (Bantam-Dell, 2010), and receives royalties on its sale

- This presentation will include a discussion of off-label drug use
Basic Premises

- Biologically driven behaviors / states
  - Often occur irrespective of environmental contingencies
  - Do not necessarily serve a social function
  - May be outwardly visible, or may occur as internal neurobiological states
  - Specific behaviors / states are linked to specific brain regions and neurotransmitters

Basic Premises

- Biologically driven behaviors or internal states: Examples
  - Hunger / Satiety
  - Fear
  - Arousal
  - Anxiety
  - Depression
  - Complex behaviors (Tics, Compulsions)

Neuropsychological Traits in Children with ASD

- Abnormal regulation of arousal
- Abnormal regulation of attention
- Abnormal regulation of sleep
- Abnormal Sensory Processing
- Cognitive Rigidity

Neuropsychological Traits in Children with ASD

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- Abnormal Sensory Processing
- Cognitive Rigidity

Basic Premises

- Socially driven behaviors / states
  - Occur in response to environmental contingencies
  - May or may not be externally visible
    - Ex: Sadness vs. crying
  - Serve a social function
    - Attention
    - Access to desired objects or activities
    - Escape from undesired activities
    - And many others....

Basic Premises

- Biologically Driven and Socially Driven systems interact
  - Ex: Task mastery takes longer in children with biologically based developmental delay, affording them with more opportunities to discover that tantrums or SIB are great ways to escape from tasks
Basic Premises
• Either the cause or the function of the behavior (or both) may be a mix of biological and social factors

Grooming Behavior
• Social bonding
• Stress reduction

Forms & Drivers of Behavior

<table>
<thead>
<tr>
<th>Form/Driver</th>
<th>Internal State</th>
<th>External Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological</td>
<td>Hunger, Thirst, Satiety, Fear, Arousal, Pleasure, Pain, Anxiety, Depression, Obessions, Etc.</td>
<td>Hyperventilation, Diaphoresis (sweating), Piloerection (hair on end), Pupillary dilatation, Goal-seeking (food, water, peer group, mate), Aggression, SIB, Tics, Compulsions, Etc.</td>
</tr>
</tbody>
</table>

Basic Premises
• Intervention
  – Should address:
    • Internal and externally visible behaviors / traits / states
    • Biological and social dimensions
  – May requires pharmacologic as well as behavioral measures

Neuropsychological Traits in Children with ASD

Cognitive Rigidity
(Difficulty shifting mental sets)

- Without a doubt
- Reply hazy, try again
- Signs point to NO
- Better not tell you now...

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First sort by: Size / Color / Shape, Then switch to Color / Shape / Size

Cognitive Rigidity
(Difficulty shifting mental sets)

- Insistently repetitious behavior
- Difficulty with unmet expectations
- Perfectionism
- Compulsions
- (Aggression, SIB)

Perfectionism
Obsessions
(Anxiety / Depression)

"Internalizing Behaviors"

Cognitive Rigidity → Anxiety → Disruptive Behavior

“Our son experiences extreme anxiety when what he anticipates isn’t what happens...When we know a change is coming we can prepare him, but those we can’t anticipate are still very upsetting for him...The switch flips in his mind, and it’s out of his control.”

6 y.o. boy with ASD, anxiety, and normal nonverbal IQ

Cognitive Rigidity: Changes in Routine / Unmet Expectations

Rainman, 1988

Anxiety

RM: 9 y.o. boy: ASD, normal IQ, anxiety d/o, disruptive behavior. Mother: Anxiety D/O; PGM hoarding & OCD

Rainman, 1988

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Anxiety

RD. 7 y.o. F, nI IQ, PDD-NOS & Anxiety. Father: GAD

Anxiety

RD. 7 y.o. F, nI IQ, PDD-NOS & Anxiety. Father: GAD

The house is on fire and we are running for our life.

A.W.: 9 year old boy with PDD-NOS and normal IQ (MRN 11-07710)

Depression

KO; 10 yr old female, PDD-NOS, normal IQ

Compulsions

15 y.o. boy Asperger Syndrome

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Perfectionism

Anxiety, Perfectionism, and Disruptive Behavior

B was cooperative and motivated to do well... However, he became increasingly frustrated as the testing progressed... This resulted in a cycle where he repetitively vocalized his need to complete the task and then became angry and frustrated by the questions he was being asked. Even after he was told that he did not have to complete the task it took him about 15 minutes to accept this and leave the office with his mother.... Given his otherwise kind and mild-mannered nature, it does not appear to this examiner that any of B's behavior is primarily oppositional or simply a tool to gain attention or escape a difficult task. When faced with tasks that he perceives as difficult or if he fears that he will make a mistake, B's internal response is so extreme that he appears to lose all ability to regulate the external expression of this emotion.

The Story of Billy's Box - 1
(or, why it's important to ID internalizing behavior)

- 8 y.o. boy with ASD and normal Nonverbal IQ
- Severe tantrums at school
- Antecedents:
  - TRANSITIONS
- Function?
  - Not attention, escape, access
  - “Biological” (i.e. “just part of his ASD”)?

The Story of Billy's Box - 2
(or, why it's important to ID internalizing behavior)

Q: “Billy – You're always getting in trouble at school. What’s going on?”

A: “I'm afraid that if I hand in my work, I'll never get a chance to go back and make it perfect.”
Throughout the session, "Alice" delivered a steady stream of self-deprecating comments, calling herself "stupid," or perseveratively asking if she was "fat." During the Bender, she anxiously and angrily twisted the eraser off the tip of the pencil, while declaring "Why do I keep making stupid mistakes?" As her stress level rose, she escalated to slapping herself, and then punching herself in the face.

**Standard Score: 138**

**Anxiety, Perfectionism, and Self-Injurious Behavior**

**Pearl**

- Self-Injurious Behavior reduces stress

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**Stress Reduction Kit**

**BANG**

**HEAD**

**HERE**

Directions:
1. Place kit on firm surface
2. Follow directions in circle
3. Repeat Step 2 as necessary
4. If unconscious, cease stress reduction

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Solving the puzzle of deliberate self-harm: The experiential avoidance model

Alexander L. Chapman⁎•, Kim L. Gratz⁎, Milton Z. Brown⁎•

“Deliberate Self Harm (DSH) is primarily maintained by negative reinforcement in the form of escape from, or avoidance of, unwanted emotional experiences.”

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Chapman et al. Behav Res & Ther. 44(2); 2006; pp 371-394

Based on Chapman et al. Behav Res & Ther. 44(2); 2006; pp 371-394
Pearl

- It’s not the task per se that the child is trying to escape; it’s preemptive fear of failure
- What the child needs is a Positive Behavior Support Plan for internalizing behavior
  - What would that look like?

Positive Behavior Support Plan for Internalizing Behavior

- Staff Awareness
- Visual Schedules
- Verbal preparation
- Relaxation Techniques
- Cognitive Behavioral Therapy (CBT)
- SSRIs

Not seeing the vase (ignoring internalizing behavior)
Seeing the vase
(recognizing internalizing behavior)

<table>
<thead>
<tr>
<th>Antecedents</th>
<th>Behaviors</th>
<th>Consequences</th>
<th>Perceived Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task Demand</td>
<td>Tantrums</td>
<td>Temporary reduction in anxiety via task avoidance or SIB</td>
<td>Avoidance of self-blame for not completing the task perfectly</td>
</tr>
<tr>
<td>Anxiety</td>
<td>Elopings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perfectionism</td>
<td>Task Refusal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear of Failure</td>
<td>SIB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Not seeing the vase
(ignoring internalizing behavior)

“We caution against the use of the word “stubborn” to characterize R’s classroom behavior. R’s task avoidance and non-adherence to teacher instruction reflect cognitive rigidity and anxiety, rather than “stubborn” behavior. Re-framing his actions will lead to more appropriate intervention, placing the focus on anxiety management and cognitive flexibility, rather than “compliance.”

Positive Behavior Support Plan for Internalizing Behavior

- Staff Awareness
- Visual Schedules
- Verbal Preparation
- Relaxation Techniques
- Cognitive Behavioral Therapy (CBT)
- SSRIs

Visual Schedules

My Calming Sequence

When my worries get too big, Kari Dunn-Buron
I saw the angel in the marble and carved until I set him free.

Michelangelo

Positive Behavior Support Plan for Internalizing Behavior

- Staff Awareness
- Visual Schedules
- Verbal Preparation
- Relaxation Techniques
- Cognitive Behavioral Therapy (CBT)
- SSRIs

Selective Serotonin Reuptake Inhibitors (SSRIs)

- Primary targets
  - Cognitive Rigidity
  - Anxiety
  - Obsessions (thoughts)
  - Compulsions (behavior)
  - Perfectionism
  - Depression
  - Stereotypies: Probably not
- “Downstream” benefit:
  - Disruptive Behavior
  - Quality of Life

Without the chips, no angel!
SSRIs in ASDs

- Side Effects
  - Activation
    - Hyperactivity
    - Irritability
    - Insomnia
    - Agitation
  - Uncommon or irrelevant
    - GI dysfunction
    - Sexual dysfunction
    - “Black Box” warning (suicidal mentation)

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Brand Name</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoxetine</td>
<td>Prozac</td>
<td>The first selective SRI</td>
</tr>
<tr>
<td>Fluvoxamine</td>
<td>Luvox</td>
<td></td>
</tr>
<tr>
<td>Sertraline</td>
<td>Zoloft</td>
<td>May be less activating</td>
</tr>
<tr>
<td>Citalopram</td>
<td>Celexa</td>
<td>Prolonged QT interval</td>
</tr>
<tr>
<td>Escitalopram</td>
<td>Lexapro</td>
<td>Prolonged QT interval</td>
</tr>
<tr>
<td>And others...</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pharmacotherapy for anxiety disorders in children and adolescents

- Studies reviewed: 22 RCTs/2,519 participants
  - Short-term (average 11 wks)
  - Mean age 12 yrs
  - Drugs studied (versus placebo)
    - SSRIs: 15 (fluoxetine 6, fluvoxamine 2, paroxetine 3, sertraline 4)
    - SNRIs: 5 (clomipramine 3), venlafaxine 2)
    - Benzodiazepines: 2 (alprazolam 1, clonazepam 1)
    - Tricyclic antidepressants: 1 (desipramine)

- Meta-analysis
  - Response rate: Medication 59%; Placebo 31%
  - 7.3% of subjects treated with SSRIs withdrew be/c side effects
  - “The overwhelming majority of evidence of efficacy was for the SSRIs, with the most evidence in paediatric OCD”

Anxiety after Rx with CBT & Escitalopram

RD. 7 y.o. F, nl IQ, PDD-NOS & Anxiety. Father: GAD
MRN: 07-0427

Anxiety

RD. 9 y.o. F, nl IQ, PDD-NOS & Anxiety. Father: GAD
MRN: 07-0427
After one week on Sertraline

Sent: Thursday, May 31, 2012
To: James Coplan
Subject: amazing shift in A.D.
Importance: High

Dr. Coplan,
I "know" that it takes several weeks for SSRI's to "kick in" but the child I saw in my office today is simply a different child and the improvements are being noted across settings by multiple adults. There was NO self abuse, NO negative self statements, an availability for interventions, just a complete transformation. We "fixed" mistakes, "re-did" errors, told jokes, and played together. The "core" Autistic symptoms are obviously still there - perseveration on bras, drawing, etc - but mood-wise there is no question that A. is already benefitting from the Sertraline... Impossible perhaps but really visibly clear...

Thank you very much.
S.S. Ph.D.

The Story of Billy’s Box - 3
(or, why it’s important to ID internalizing behavior)

“Put your papers in the box, and we promise you will be able to go back later and work on them some more, if you want to.”

Regulation of Attention

Let go & Shift

Attend to stimulus #1

Attend to stimulus #2

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Abnormal Regulation of Attention - 1

- **Perseveration**
  - Inability to “Let go and shift”
  - Gets “stuck”
  - “Overattention Deficit Disorder”
- Compounds the effects of cognitive rigidity

www.drcoplan.com

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**Perseveration**

“Draw a picture of your family, with everybody doing something”

“We are going into the Grand Hyatt”

Wm W; 10 y.o. male; ASD & Anxiety; MRN 12-0827

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**Perseveration**

SL; 8 yr old male, normal IQ; PPD-NOS

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**Perseveration**

Rigid + Perseverative

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Abnormal Regulation of Attention - 2

- Inattention
  - Inability to focus
  - Impulsive
  - Distractible

Inattention

Hyperactivity

Insufficient activation of frontal cortex \(\rightarrow\) Inattention

Stahl, *Essential Psychopharmacology*, fig 12.1

Insufficient activation of frontal cortex \(\rightarrow\) Hyperactivity

Stahl, *Essential Psychopharmacology*, fig 12.1

Inattention

- Interventions
  - Limited stimuli
  - Short work periods
  - Medication
    - Stimulants
    - alpha-2 agonists

Stimulants, NRI’s

<table>
<thead>
<tr>
<th>Generic Name(s)</th>
<th>Brand Name(s)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphetamine</td>
<td></td>
<td>FDA Schedule II</td>
</tr>
<tr>
<td>Dextroamphetamine</td>
<td>Dextrostat, Dextrostat</td>
<td>FDA Schedule II</td>
</tr>
<tr>
<td>Dextroamphetamine + amphetamine</td>
<td>Adderall</td>
<td>FDA Schedule II</td>
</tr>
<tr>
<td>Methylphenidate</td>
<td>Concerta, Ritalin, Metadate</td>
<td>FDA Schedule II</td>
</tr>
<tr>
<td>Dexamphetamine</td>
<td>Focalin</td>
<td>FDA Schedule II</td>
</tr>
<tr>
<td>Atomoxetine, Attentin</td>
<td>Strattera</td>
<td>Noradrenaline reuptake inhibitor (NRI), not FDA Schedule II</td>
</tr>
</tbody>
</table>
Stimulants, NRIs

**Benefits**
- ▲ Attention Span
- ◁ Hyperactivity

**Side Effects**
- ◁ Appetite
- ▲ Growth
- ▲ Anxiety
- ▲ Agitation
- May “unmask” tics

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**Alpha-2 Agonists**

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Brand Name(s)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clonidine</td>
<td>Catapres</td>
<td>More sedating than guanfacine</td>
</tr>
<tr>
<td>Guanfacine</td>
<td>Tenex, Intuniv</td>
<td></td>
</tr>
</tbody>
</table>

- Frontal cortex / Locus Ceruleus: post-synaptic alpha-2 receptors
- Sympathetic outflow (autonomic nervous system): Pre-synaptic autoreceptors ◁BP

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**Alpha-2 agonists**
**(clonidine, guanfacine)**

Stahl, *Essential Psychopharmacology*, fig 12.6

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**Clinical Pearl**

“It’s buying him the split second before he reacts.”

Parents of a child with ASD, agitation, anxiety, and cognitive rigidity after starting guanfacine.

*(ML, MRN 13-0839)*

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**Alpha-2 Agonists**

**Benefits**
- ◁ Agitation
- ▲ Hyperactivity
- ▲ Attention Span
- No exacerbation of anxiety / rigidity
- Used to treat tics

**Side Effects**
- Sleepiness: Common
- Emotional Lability (crying) - occasional
- Hypotension (low BP) - rare

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**Alpha-2 Agonists**

- Beware of Cognitive Rigidity masquerading as ADHD
  - Perseveration on inner stimuli: “Inattentive”
  - Perfectionism:
    - “Problems w. task completion”
    - (Or: Task avoidance!)
  - Anxiety:
    - “Rushes through work”
    - “Out of seat behavior”

*www.drcoplan.com*
Abnormal regulation of arousal

Abnormal regulation of attention
  - (Perseveration)
  - (Inattention)

Cognitive Rigidity

Abnormal regulation of sleep
  - (Hypo-arousal)
  - (Hyper-arousal)

Routines
  - Stereotypies

Agitation
  - Aggression
  - SIB

Impulsivity
  - Hyperactivity

Atypical neuroleptics
  - Atypical neuroleptics
  - a2 agonists
  - GABA-ergic drugs

Impulsive
  + Agitated / Disruptive

Rigid
  + Perseverative

Regulation of Arousal

Hypoarousal
  - Calm
  - Relaxed

Fight or Flight Response
  - “Red Alert”
  - Adrenaline
  - Heart Rate
  - Resp. Rate
  - Combative

Dysregulation of Arousal & Mood

• “If he gets up on the wrong side of the bed we know it’s going to be a bad day.”
• “We feel like we’re walking on eggs”

Atypical Neuroleptics

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Brand Name</th>
<th>Comment</th>
</tr>
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<tbody>
<tr>
<td>Aripiprazole</td>
<td>Abilify</td>
<td>Relatively less risk of weight gain</td>
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<tr>
<td></td>
<td></td>
<td>FDA approved for Rx of ASD</td>
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<tr>
<td>Clozapine</td>
<td>Clozaril</td>
<td>Bone marrow suppression</td>
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<tr>
<td>Olanzapine</td>
<td>Zyprexa</td>
<td>Greater risk of weight gain</td>
</tr>
<tr>
<td>Quetiapine</td>
<td>Seroquel</td>
<td>Greater sedation</td>
</tr>
<tr>
<td>Risperidone</td>
<td>Risperdal</td>
<td>Greater risk of weight gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FDA approved for Rx of ASD</td>
</tr>
<tr>
<td>Ziprasidone</td>
<td>Geodon</td>
<td>Relatively less risk of weight gain</td>
</tr>
</tbody>
</table>
Sensory Processing

- Subjective Properties
  - Familiar / Unfamiliar
  - Pleasant / Unpleasant
  - Strong / Weak
  - Internal / External

- Sensory Input ➔ Self-awareness

- Mirror Neurons ➔ Empathy


Sensory Dysfunction

- Sensory-Seeking:
  - Chewy tube
  - Heavy work / Exercise
  - Weighted / compressive clothing

- Sensory avoidant
  - Ear-buds (noise cancelling)
  - Verbal preparation (fire drills, e.g.)

The whole is greater than the sum of its parts
Max Wertheimer
Abnormal regulation of arousal

- Perseveration
- Inattention

Abnormal regulation of attention

Cognitive Rigidity

Abnormal regulation of sleep

Sensory Processing

- Hypo-arousal
- Hyper-arousal

Routines

Stereotypies

Sensory-Seeking

Agitation

SIB

Impulsivity

Hyperactivity

- Stimulants
- α-2 agonists

Atypical neuroleptics

SSRIs

Melatonin

Disordered Sleep

Sensory Dysfunction

Behaviorism

Behaviorism made simple

STIMULUS (the Antecedent)

RESPONSE (the Behavior)

The Consequence

Operant Conditioning

Skinner

- Experimental manipulation of the consequences for a given behavior alters probability that that behavior will recur.

Consequences 1: Reinforcers

- Reinforcers lead to an increase in frequency of the antecedent behavior
  - Positive Reinforcement (adds something)
    - Attention
    - Access to desired object / activity
  - Negative Reinforcement (removes something)
    - Escape from task
    - Removal of non-preferred food
  - Advanced techniques: Chaining, Reverse Chaining, Fading, DRO, etc.
Consequences 2: Aversives

- **Time Out**
  - Only works if child values adult attention

- **Logical Consequences**
  - If child refuses to use toilet, child must carry backpack with spare clothes, when family is in public

- **Over-correction**
  - Must wash out soiled diaper
  - If the child spills milk on purpose: child must mop the entire kitchen floor

Token Economy: The next step beyond Time Out

- Concretely specified behaviors
- Earn and Lose Points
- Points → Access to preferred items
  - Preferred toys, Computer time, etc.
  - NO access to preferred item at other times
  - “Extra” treats not as effective
- Works with children who understand rule-based play (CandyLand, Uno, etc.)

Summary

- **Biological Drivers**

- **Social Contingencies**

- Internal States and Observable Behaviors

An ounce of prevention....

- Identify *internalizing* behaviors *before* they lead to *externalizing* behaviors
  - Behavior Management Plan that proactively seeks to avert or dissipate anxiety

Summary

- **Why this child?**
  - What is this child’s developmental Level?
  - Is this stage-appropriate behavior?
  - Does the behavior serve a social function?
    - Escape, access, attention
  - Is the classroom placement appropriate?
    - Language level?
  - Does this behavior occur in other settings?
  - Family factors?
    - Parents consistent at home?
    - Parental psychopathology? (Anxiety, Depression, Alcohol)
Summary

- Why this child?
  - Neuropsychological factors?
    - Cognitive Rigidity
    - Dysregulation of attention
    - Dysregulation of arousal
    - Sensory Seeking / Sensory Overload
- Behavioral Intervention – Usually
- △ Classroom setting: Sometimes
- Family therapy: Sometimes
- Medication: Sometimes