



JAMES COPLAN, M.D.  
*Neurodevelopmental Pediatrician • Author • Speaker*  
*Making Sense of Autistic Spectrum Disorders*



Behavior management and psychopharmacology  
in children with autistic spectrum disorders

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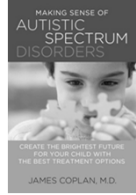


Colin J. Condon, MD - Care of the Sick Child Conference  
November 13-15, 2013

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## 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



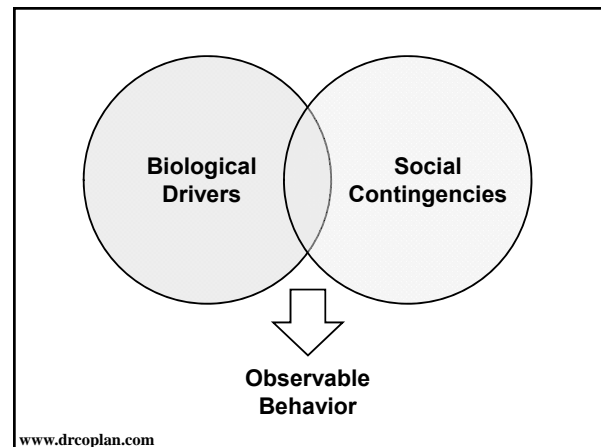
- This presentation will include a discussion of off-label drug use

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## “Behavior”

- “The manner of conducting one’s self”
- “Anything than an organism does involving action and response to stimulation”
- “The actions or reactions of a person or animal in response to internal or external stimuli”

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## Outline / Basic Premises - 1

- **Biologically driven behaviors / traits**
  - Cognitive Rigidity
  - Dysregulation of Attention
  - Dysregulation of Arousal
  - Dysregulation of Sleep
  - Dysregulation of Sensory Processing
- **Occur *irrespective of environmental contingencies***
- ***Do not serve a social function***
- **Specific behaviors / traits are tied to specific neurotransmitters / brain systems**

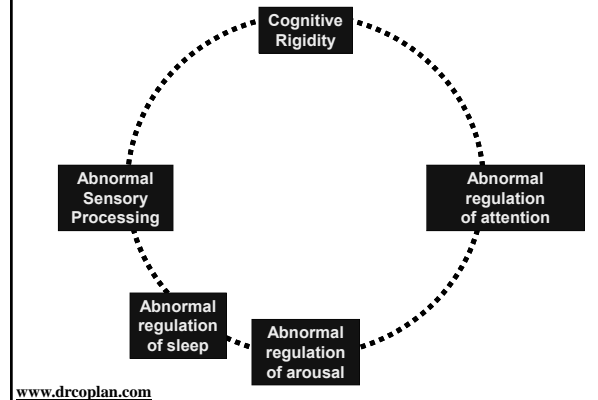
## Outline / Basic Premises - 2

- **Socially driven behaviors**
  - Occur in response to environmental contingencies
  - Serve a social function
    - Attention
    - Access to desired objects or activities
    - Escape from undesired activities
  - A-B-C Model
    - What is the Antecedent to the behavior?
    - What is the Behavior itself?
    - What are the Consequences for the behavior?

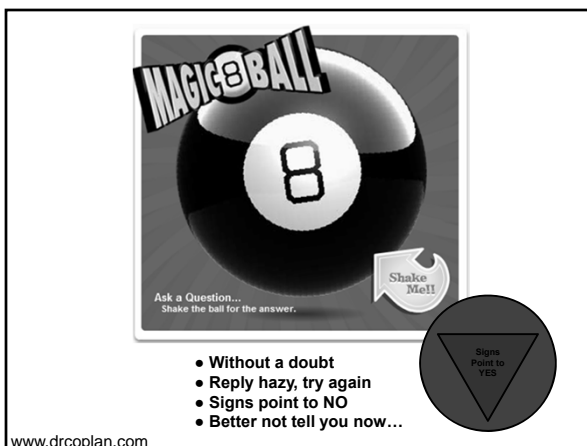
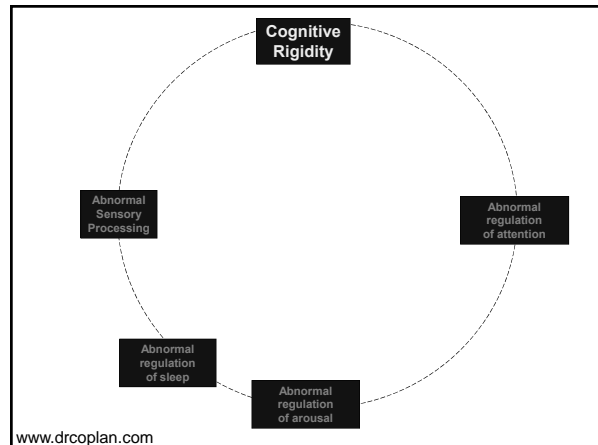
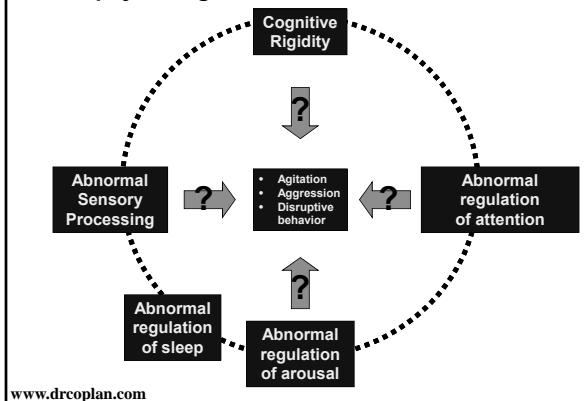
### Outline / Basic Premises - 3

- Behavior analysis needs to take biological and environmental factors into account:
  - Underlying biological traits often provide the child with lots of opportunities to make unfortunate discoveries (viz: Tantrums or SIB are great ways to get attention or escape from tasks)
- Intervention often requires both pharmacologic and behavioral measures

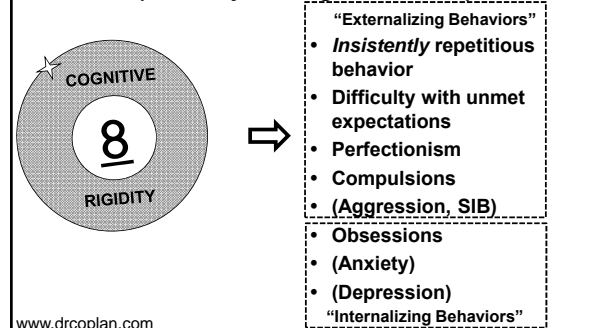
### Neuropsychological Deficits in Children with ASD

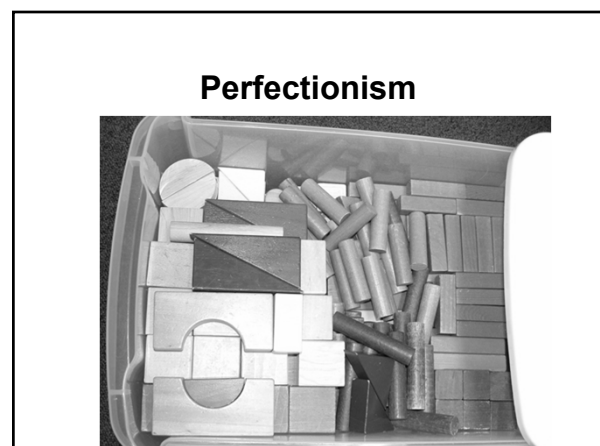
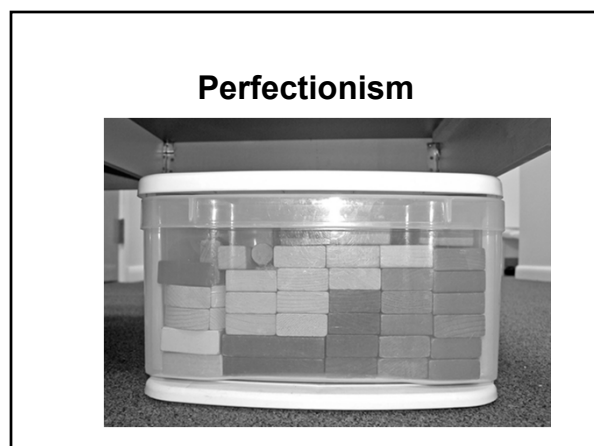
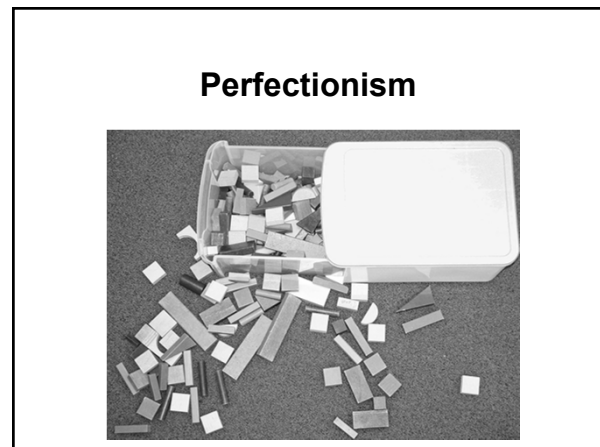
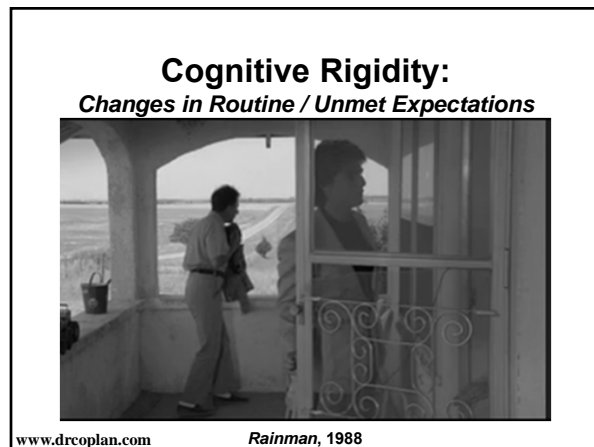
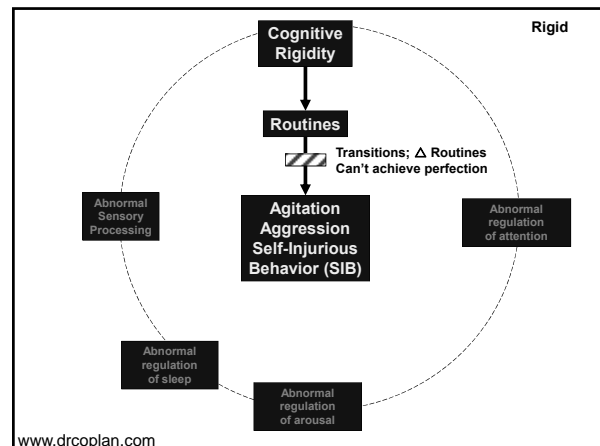
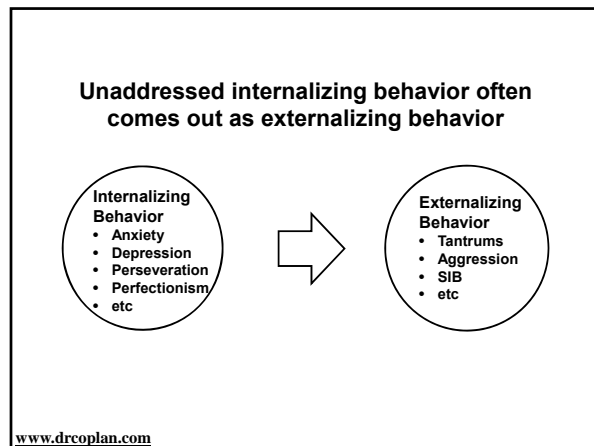


### Neuropsychological Deficits in Children with ASD

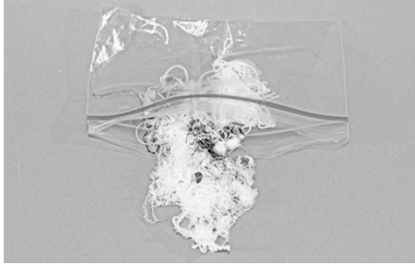


### Cognitive Rigidity (Difficulty shifting mental sets)





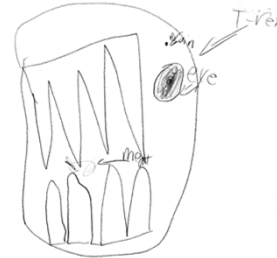
### Compulsions



Joseph F: 15 y.o. boy Asperger Syndrome

MRN: 05-0096

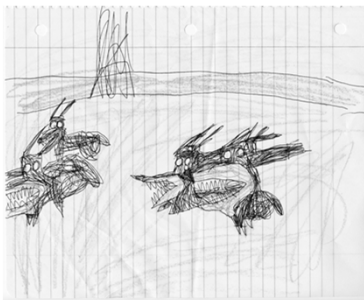
### Anxiety



RM: 9 y.o. boy: ASD, normal IQ, anxiety d/o, disruptive behavior.  
Mother: Anxiety D/O; PGM hoarding & OCD  
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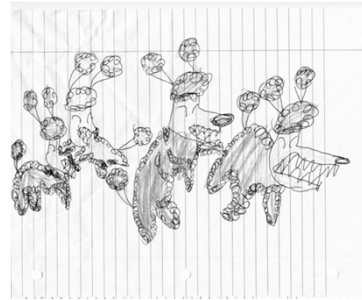
MRN: 10-0642

### Anxiety



RD. 7 y.o. F, nl IQ, PDD-NOS & Anxiety. Father: GAD  
[www.drcoplan.com](http://www.drcoplan.com) MRN: 07-0427

### Anxiety



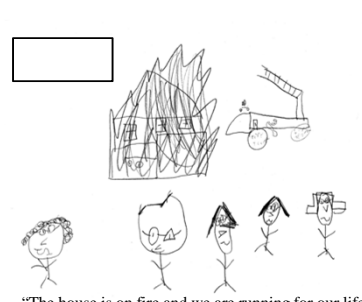
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### Anxiety



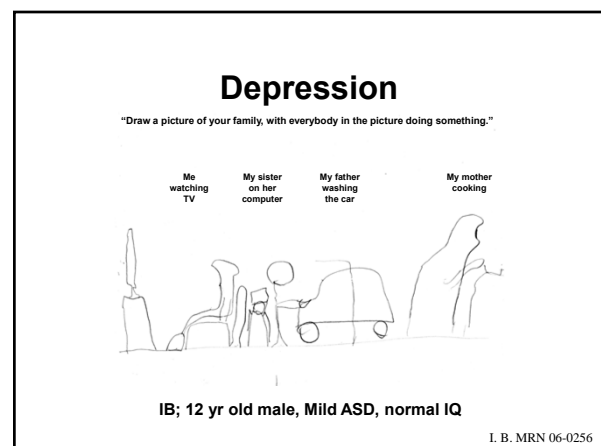
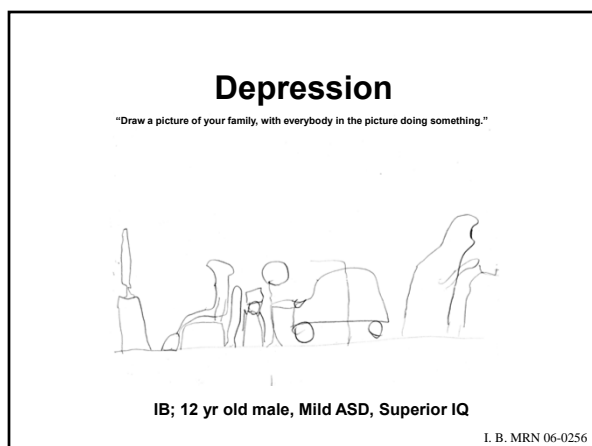
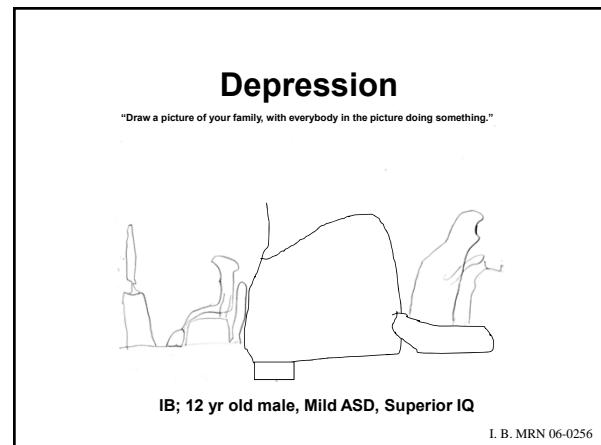
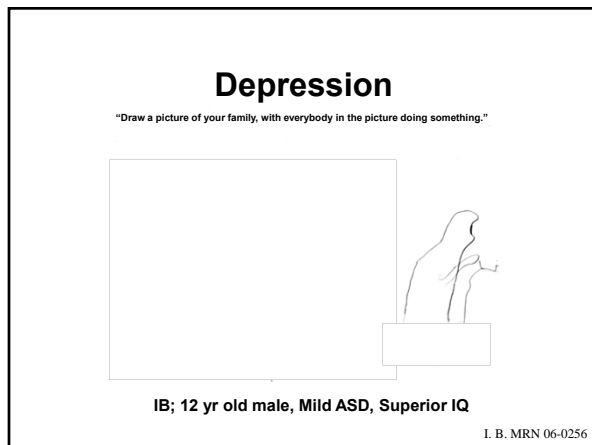
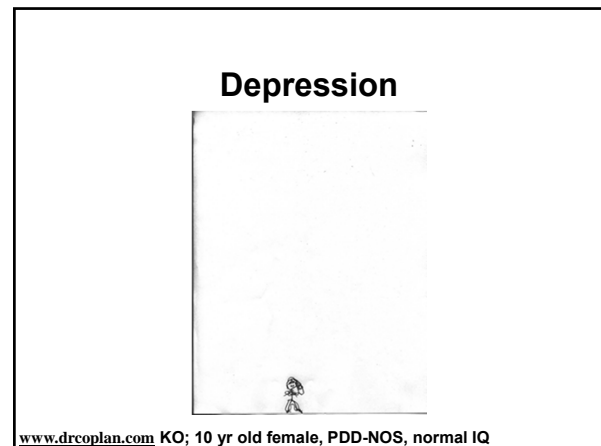
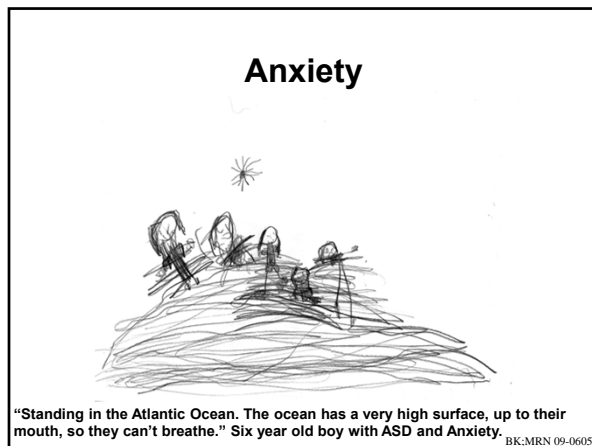
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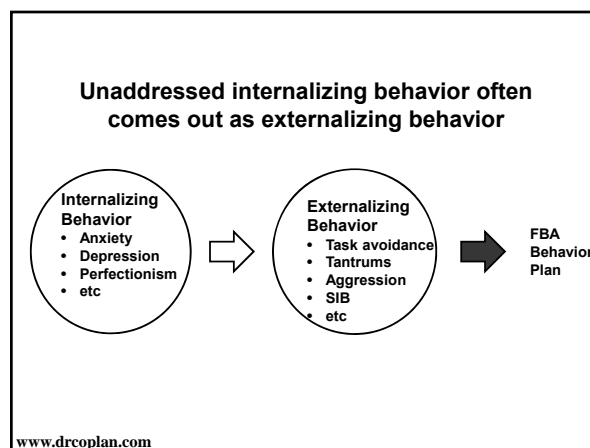
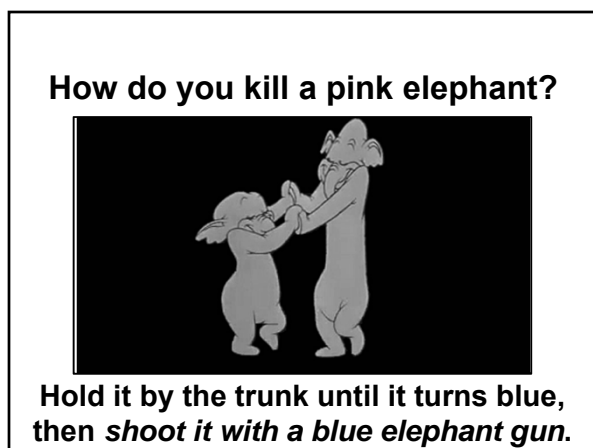
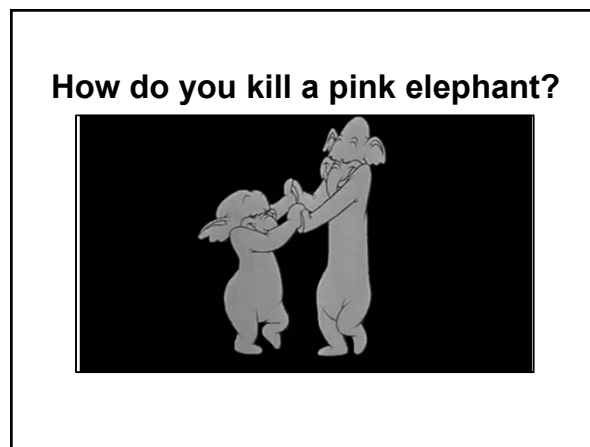
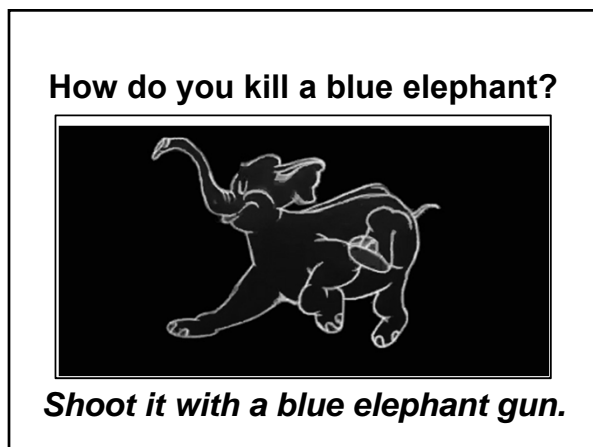
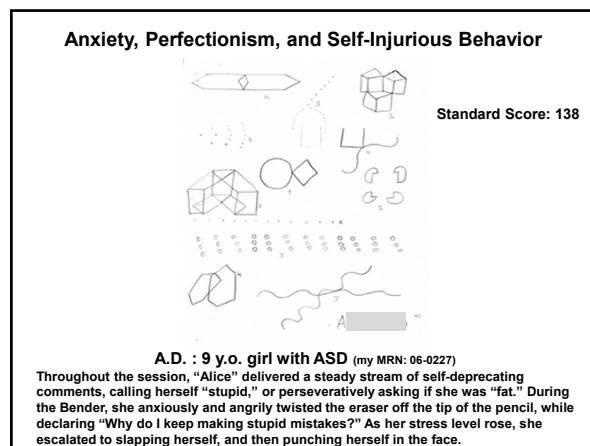
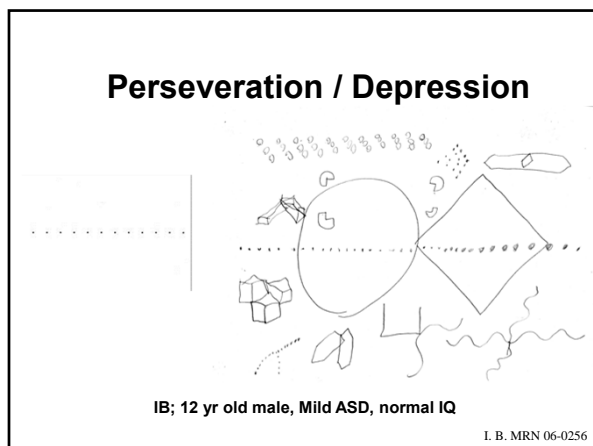
### Anxiety

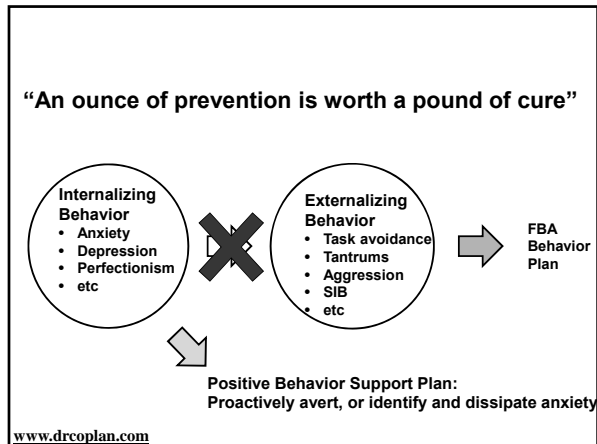


"The house is on fire and we are running for our life."

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







**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."**

**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."

**Positive Behavior Support Plan for Internalizing Behavior**

- Staff Awareness
- Visual Schedules
  - What am I supposed to be doing *now*?
  - What am I supposed to do *next*?
- Relaxation Techniques
  - Mental Imagery
  - Isometrics
  - Deep Breathing
  - "Break" cards
- Cognitive Behavioral Therapy (CBT)
- SSRIs

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Disrespectful

Disruptive

Non-compliant

Impulsive

Unmotivated

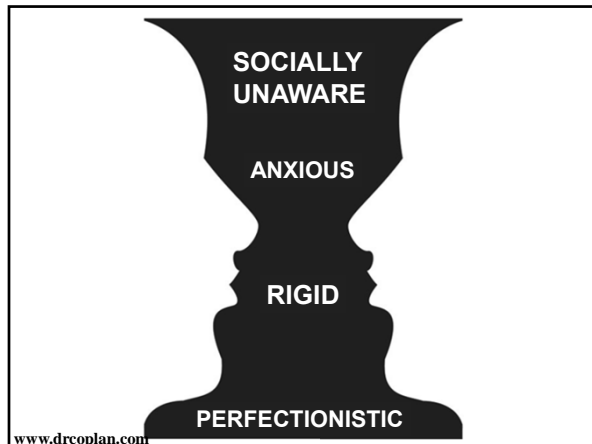
Inattentive

Stubborn

Aggressive

Could do better if only he tried harder

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### Not seeing the vase (ignoring internalizing behavior)

"We caution against the use of the word "stubborn" to characterize Ryan's classroom behavior. Ryan'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."

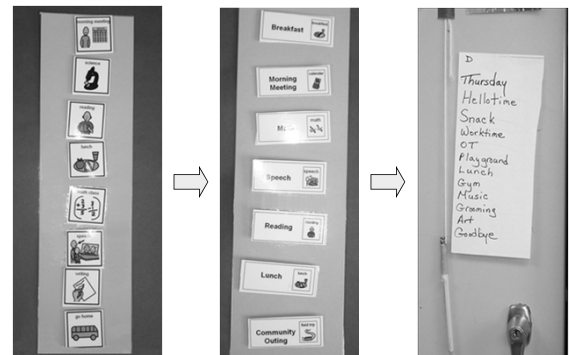
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### Positive Behavior Support Plan for Internalizing Behavior

- Staff Awareness
- Visual Schedules
  - What am I supposed to be doing *now*?
  - What am I supposed to do *next*?
- Relaxation Techniques
  - Mental Imagery
  - Isometrics
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- SSRIs

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### Visual Schedules



### Positive Behavior Support Plan for Internalizing Behavior

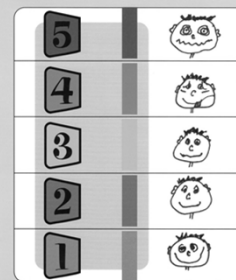
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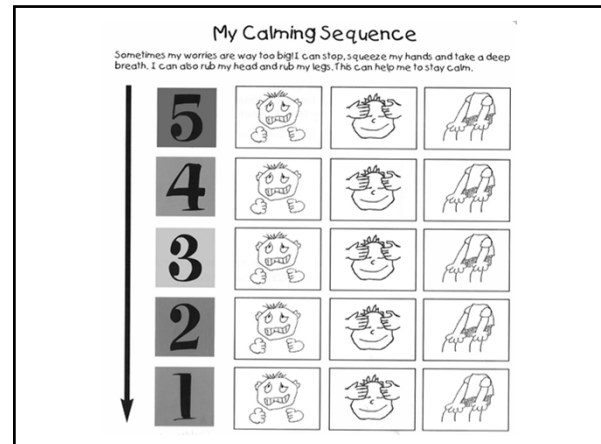
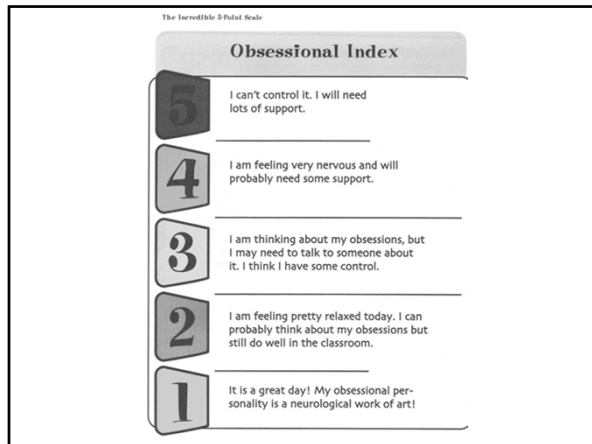
### The Incredible 5-Point Scale

Assisting students with autism spectrum disorders  
in understanding social interactions  
and controlling their emotional responses

Kari Dunn Buron and Mitzi Curtis



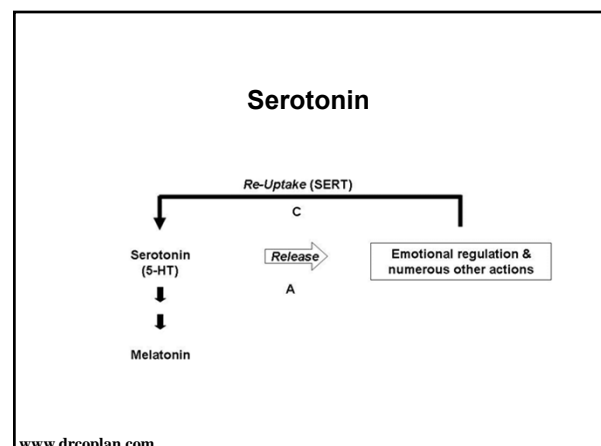
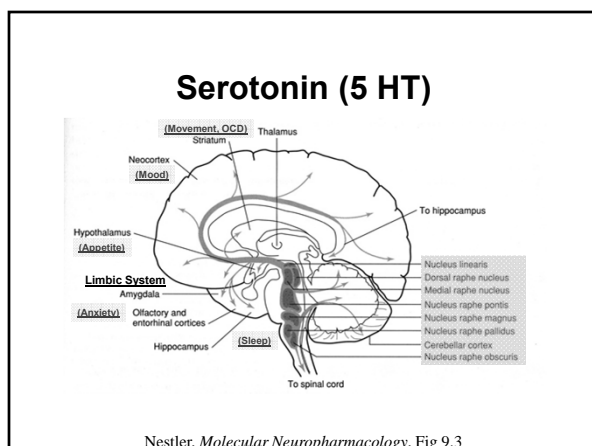
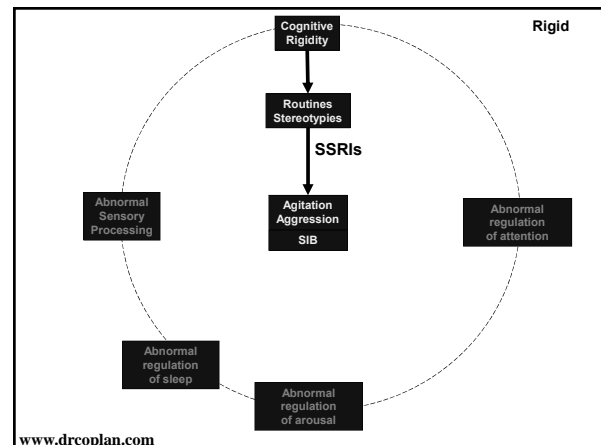




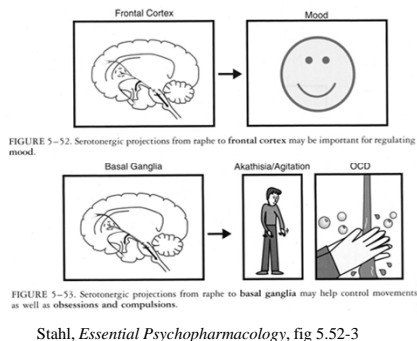
### Positive Behavior Support Plan for Internalizing Behavior

- **Staff Awareness**
- **Visual Schedules**
  - What am I supposed to be doing *do now?*
  - What am I supposed to do *next?*
- **Relaxation Techniques**
  - Mental Imagery
  - Isometrics
  - Deep Breathing
  - “Break” cards
- **Cognitive Behavioral Therapy (CBT)**
- **SSRIs**

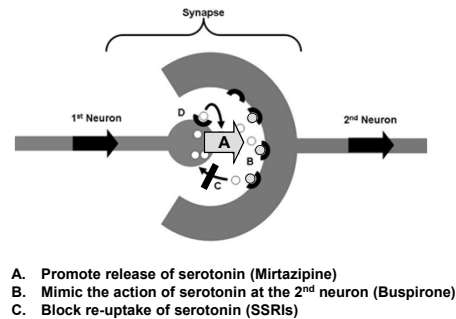
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## Serotonin (5 HT) Pathways



## Serotonin promoting (serotonergic) drugs



## 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

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## SSRIs in ASDs

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

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## Selective Serotonin Reuptake Inhibitors (SSRIs)

Generic Name	Brand Name	Comment
Fluoxetine	Prozac	• The first selective SRI
Fluvoxamine	Luvox	
Sertraline	Zoloft	• May be less activating
Citalopram	Celexa	• Prolonged QT interval
Escitalopram	Lexapro	• Prolonged QT interval
And others...		

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## Selective serotonin reuptake inhibitors (SSRIs) for autism spectrum disorder (ASD).

Williams, K., et al., Cochrane Database Syst Rev, 2010. 8: p. CD004677

- **Studies reviewed: 7 randomized controlled trials / 271 participants**
  - Fluoxetine (2), fluvoxamine (2), fenfluramine (2), citalopram (1)
  - Subjects: Children (5); Adults (2)
  - Varying inclusion criteria for Dx of ASD and IQ
  - 17 different outcome measures
- **“Data were unsuitable for meta-analysis”**

### Selective serotonin reuptake inhibitors (SSRIs) for autism spectrum disorder (ASD).

Williams, K., et al., Cochrane Database Syst Rev, 2010. 8: p. CD004677

#### Authors' conclusion:

"There is no evidence that SSRIs are effective as a treatment for children with autism. In fact, there is emerging evidence that they are not effective and can cause harm. As such SSRIs cannot be recommended as a treatment for children with autism at this time."

### Selective serotonin reuptake inhibitors (SSRIs) for autism spectrum disorder (ASD).

Williams, K., et al., Cochrane Database Syst Rev, 2010. 8: p. CD004677

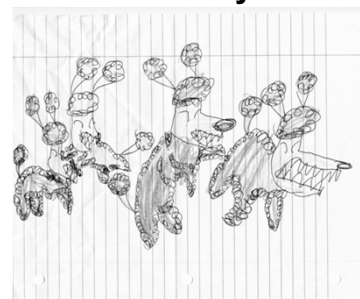
- Treatment-emergent symptoms
  - Citalopram: 1 child with new onset seizures (continued to have seizures after citalopram was stopped)
  - Fluoxetine (Hollander 2005): 6 of 37 children had their dosage reduced due to agitation
    - 2 children in the placebo group also had their "dosage" reduced. Difference between groups: Not significant
    - Reviewers disregard the fact that by the end of the trial, "anxiety and nervousness" was lower in the fluoxetine group compared to placebo: 15.9% vs. 33%.
  - Fluvoxamine: No significant difference in side effects between SSRI and placebo

### Pharmacotherapy for anxiety disorders in children and adolescents

Ipser JC, Stein DJ, Hawkrigge S, Hoppe L. Cochrane Database of Systematic Reviews 2009, Issue 3.

- 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 bec/o side effects
  - "The overwhelming majority of evidence of efficacy was for the SSRIs, with the most evidence in paediatric OCD"

### Anxiety



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

### Anxiety after Rx with CBT & Escitalopram



RD. 9 y.o. F, nl IQ, PDD-NOS & Anxiety. Father: GAD  
www.drcoplan.com MRN: 07-0427

### Anxiety



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

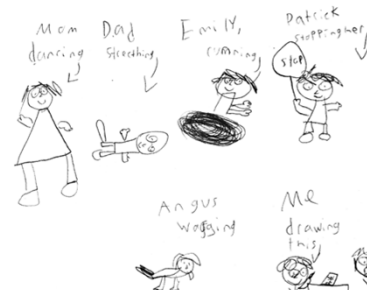
A.W.: 9 year old boy with PDD-NOS and normal IQ (MRN 11-07710)

### Fluoxetine 10 mg/d



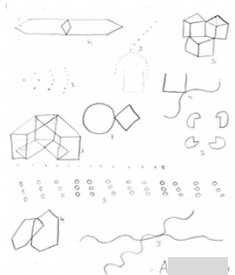
A.W.: 9 year old boy with PDD-NOS and normal IQ (MRN 11-07710)

### Fluoxetine 10 mg/d + Psychotherapy



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

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



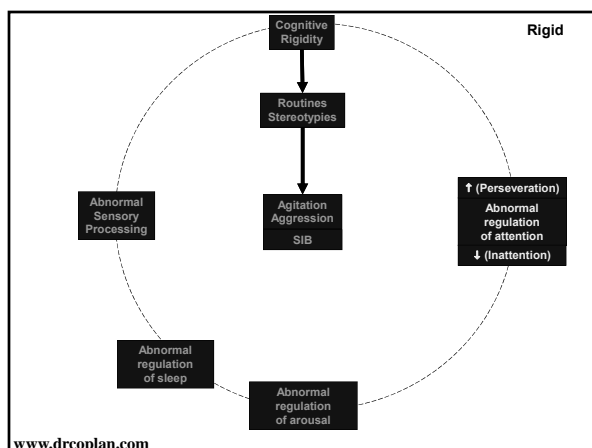
Standard Score: 138

A.D.: 9 y.o. girl with ASD (my MRN: 06-0227)  
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.

### 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.



### Regulation of Attention

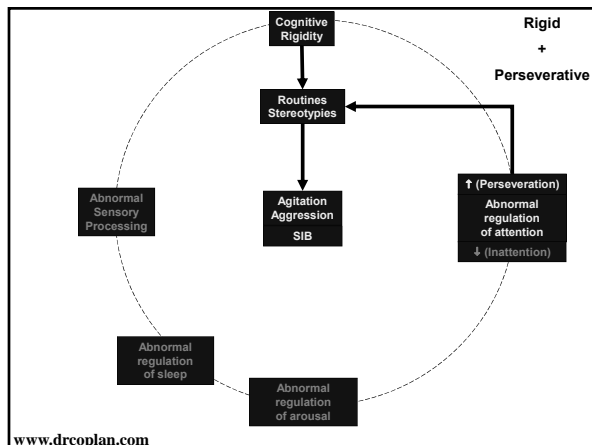


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## Abnormal Regulation of Attention - 1

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

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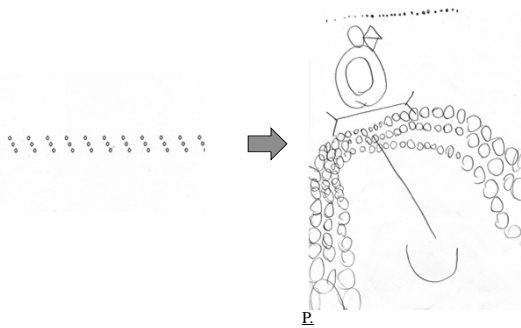
## Perseveration

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

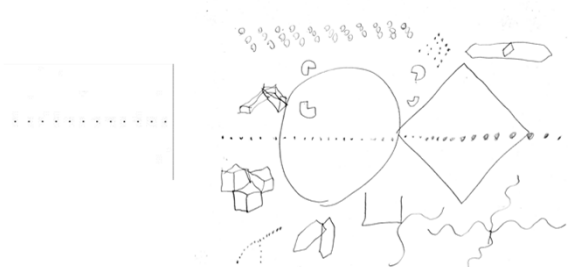


Wm W; 10 y.o. male; ASD & Anxiety; MRN 12-0827

## Perseveration



## Perseveration / Depression



IB; 12 yr old male, Mild ASD, normal IQ

I. B. MRN 06-0256

## Abnormal Regulation of Attention (Perseveration)

### • Interventions

- Verbal preparation for transitions
- Visual Schedules
- SSRIs (OCD: Proven; ASD: likely)

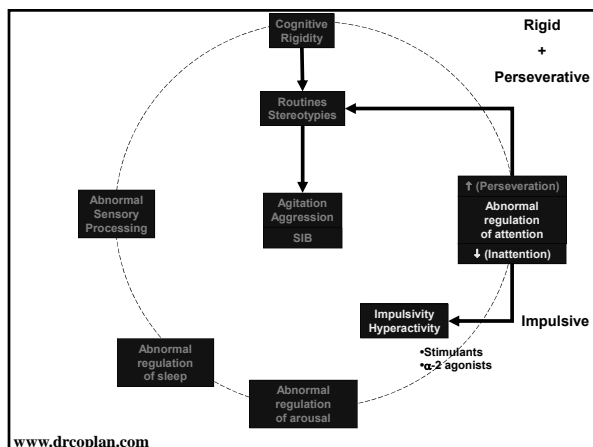
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## Abnormal Regulation of Attention - 2

### • Inattention

- Inability to focus
- Impulsive
- Distractible

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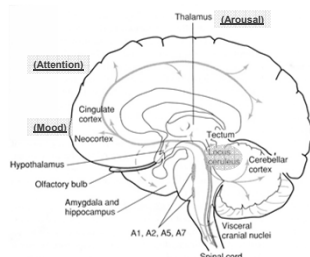
## Inattention

### • Interventions

- Limited stimuli
- Short work periods
- Medication
  - Stimulants (may ↑ anxiety / rigidity / agitation)
  - alpha-2 agonists

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## Noradrenergic pathways (Norepinephrine)



Locus Coeruleus ("blue spot"): Principal noradrenergic source in brain.

Nestler, *Molecular Neuropsychopharmacology*, Fig 8.5

## Noradrenergic pathways (Norepinephrine)

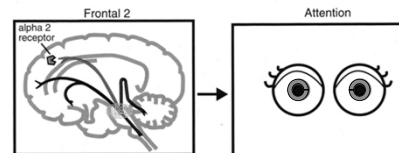
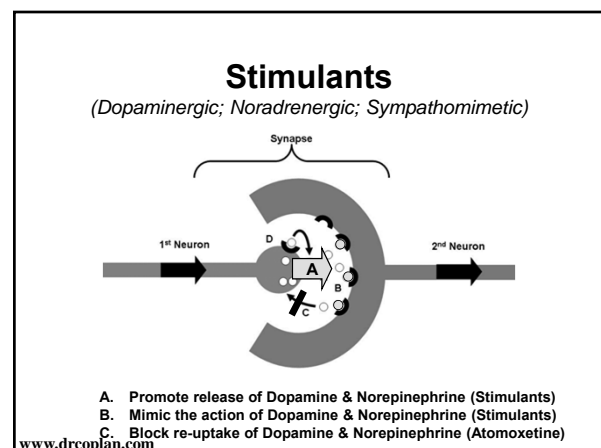
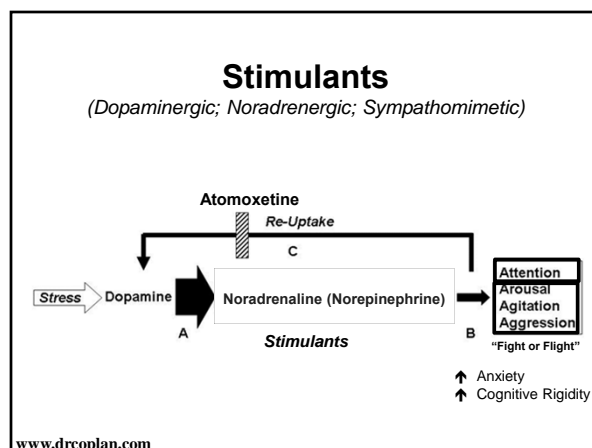
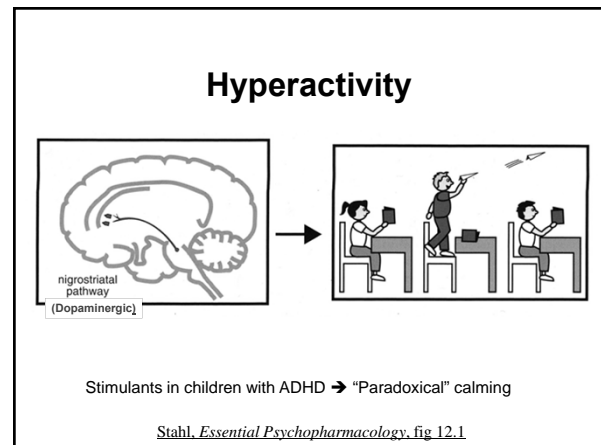
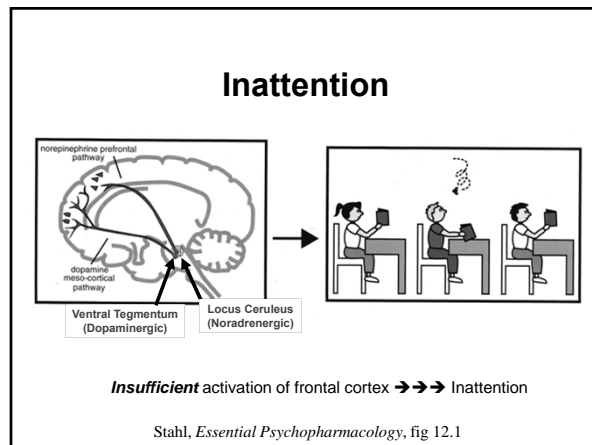
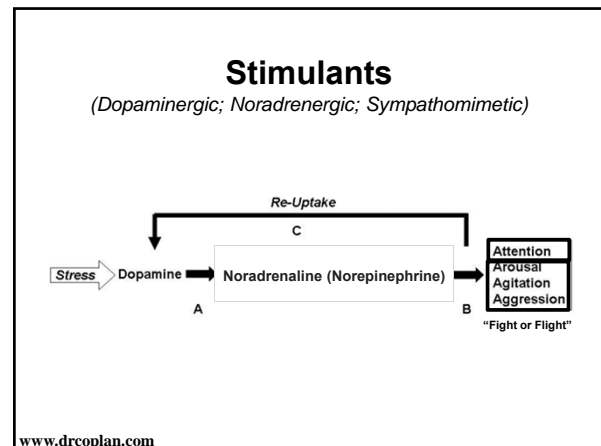
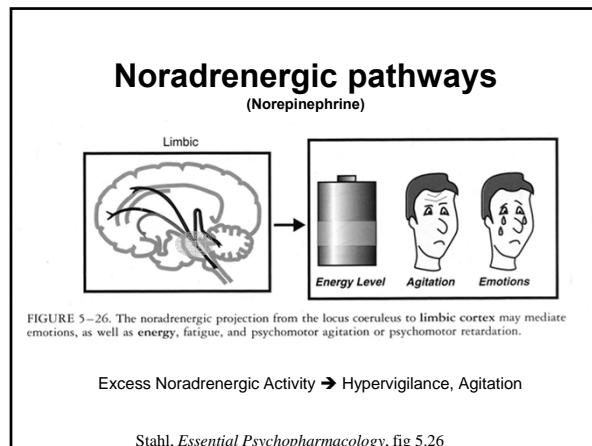


FIGURE 5–25. Other noradrenergic projections from the locus coeruleus to frontal cortex are thought to mediate the effects of norepinephrine on attention, concentration, and other cognitive functions, such as working memory and the speed of information processing. Alpha 2 postsynaptic receptors may be important in transducing postsynaptic signals regulating attention in postsynaptic target neurons.

Stahl, *Essential Psychopharmacology*, fig 5.25

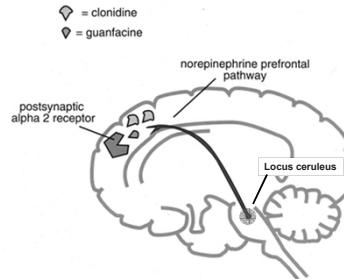


## Stimulants, NRI's

Generic Name(s)	Brand Name(s)	Comment
Amphetamine		FDA Schedule II
Dextroamphetamine	Dexedrine, Dextrostat	FDA Schedule II
Dextroamphetamine + amphetamine	Adderall	FDA Schedule II
Methylphenidate	Concerta, Ritalin, Metadate	FDA Schedule II
Dexmethylphenidate	Focalin	FDA Schedule II
Atomoxetine, Attentin	Strattera	Norepinephrine reuptake Inhibitor (NRI), not FDA Schedule II

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## Alpha-2 agonists (clonidine, guanfacine)



Stahl, *Essential Psychopharmacology*, fig 12.6

## Alpha-2 Agonists

Generic Name	Brand Name(s)	Comment
Clonidine	Catapres	More sedating than guanfacine
Guanfacine	Tenex, Intuniv	

- 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

### Benefits

- ↓ Agitation
- ↓ Hyperactivity
- ↑ Attention Span
- No exacerbation of anxiety / rigidity

### Side Effects

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

## Alpha-2 Agonists

**"It's buying him the split second before he reacts."**

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

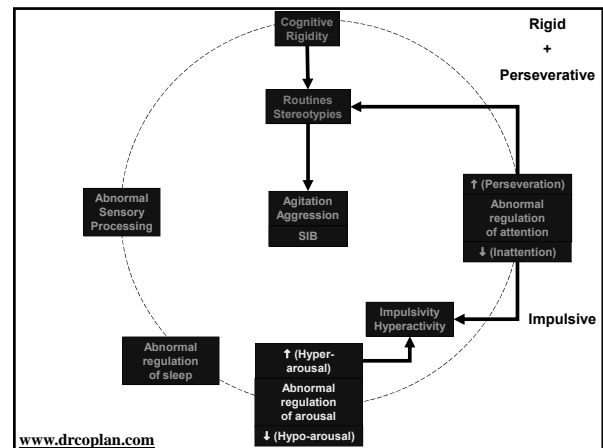
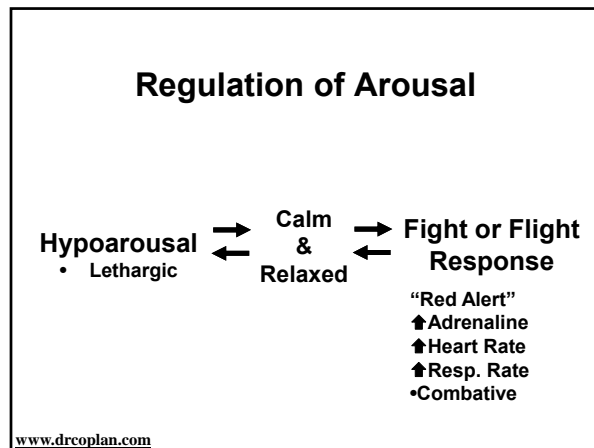
(ML; MRN 13-0839)

## Clinical Pearl

- **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"

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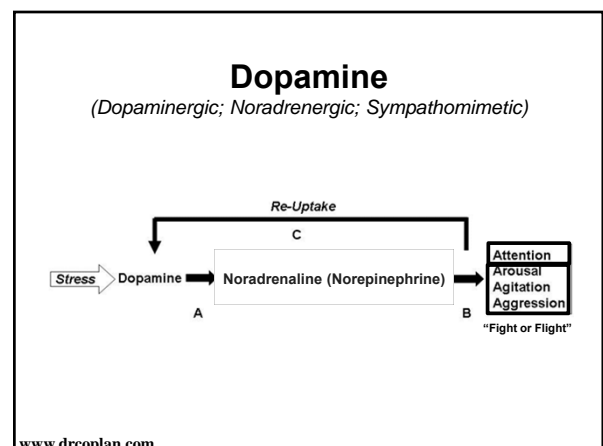
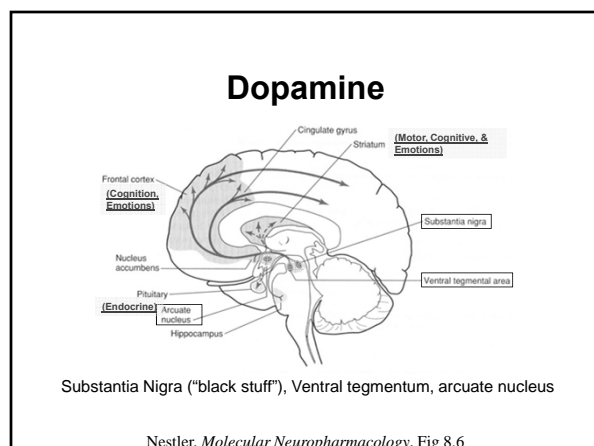
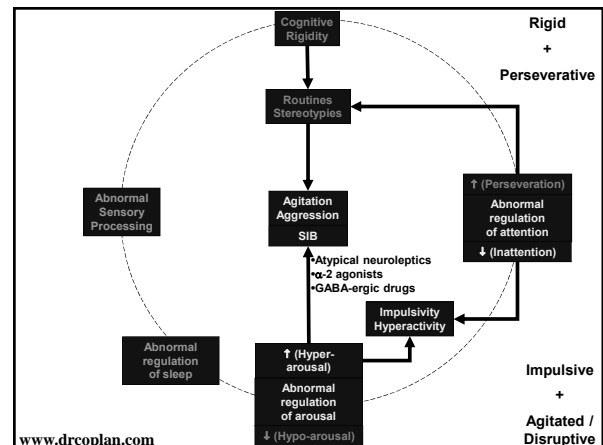


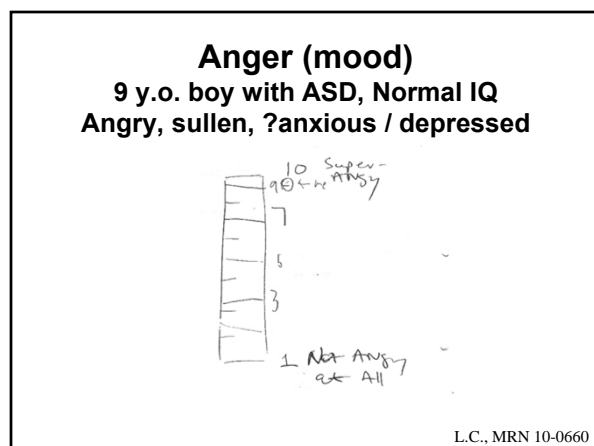
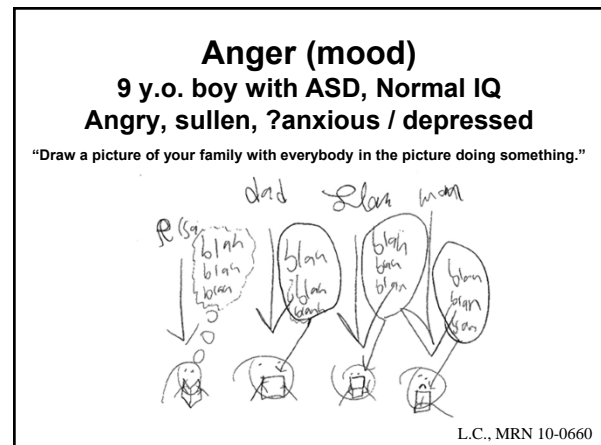
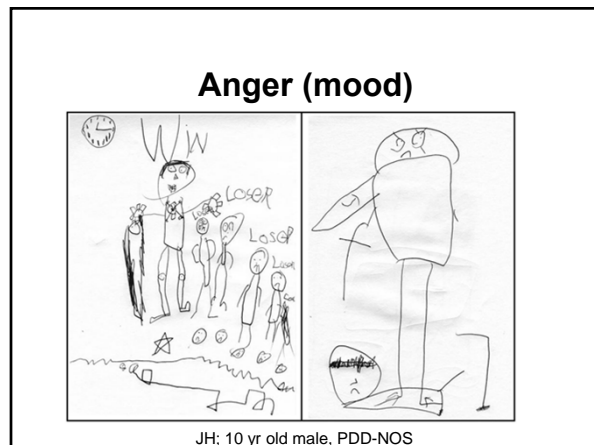
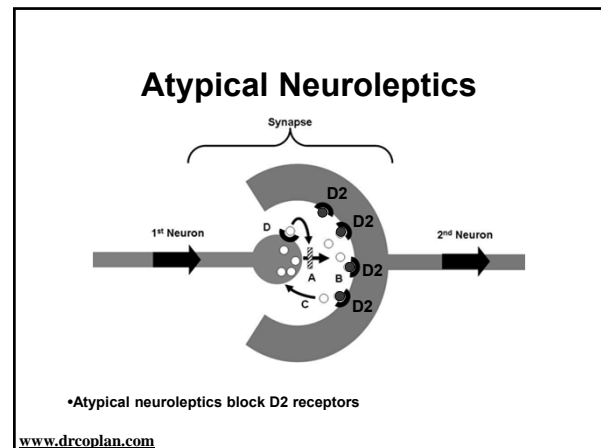
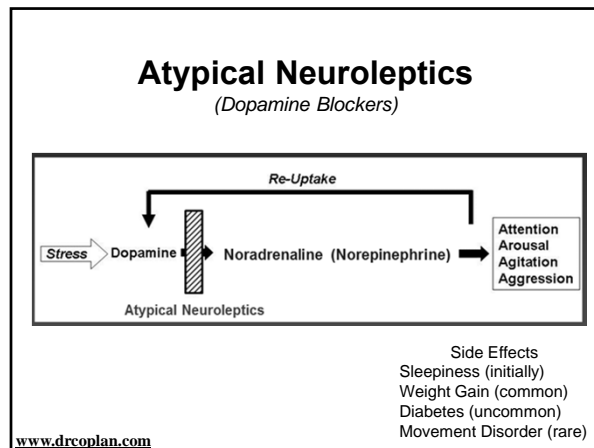


**“He is so hard to calm down when he gets upset....His emotional thermostat doesn’t work”**

**Parent of an 8 year old with ASD**

F. O. MRN 06-0208

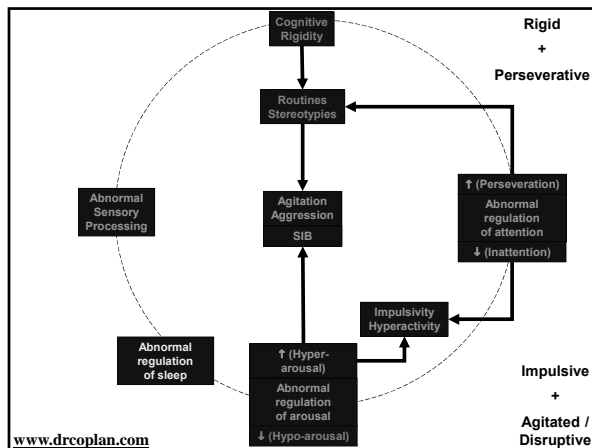




### Atypical Neuroleptics

Generic Name	Brand Name	Comment
Aripiprazole	Abilify	<ul style="list-style-type: none"> <li>Relatively less risk of weight gain</li> <li>FDA approved for Rx of ASD</li> </ul>
Clozapine	Clozaril	<ul style="list-style-type: none"> <li>Bone marrow suppression</li> </ul>
Olanzapine	Zyprexa	<ul style="list-style-type: none"> <li>Greater risk of weight gain</li> </ul>
Quetiapine	Seroquel	<ul style="list-style-type: none"> <li>Greater sedation</li> </ul>
Risperidone	Risperdal	<ul style="list-style-type: none"> <li>Greater risk of weight gain</li> <li>FDA approved for Rx of ASD</li> </ul>
Ziprazidone	Geodon	<ul style="list-style-type: none"> <li>Relatively less risk of weight gain</li> </ul>

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## Regulation of Sleep - 1

- **Melatonin**
  - Brain hormone
  - ↓ Metabolic rate (Heart, Temp)
  - “You’re sleepy now”
- **Suppressed by light**
  - 24 hr cycle
  - Seasonal cycle

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## Regulation of Sleep - 2

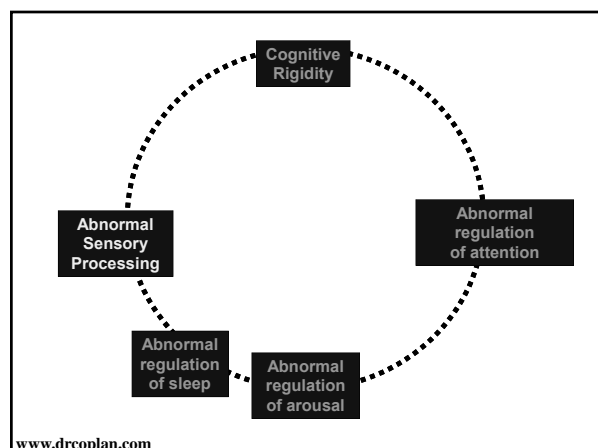
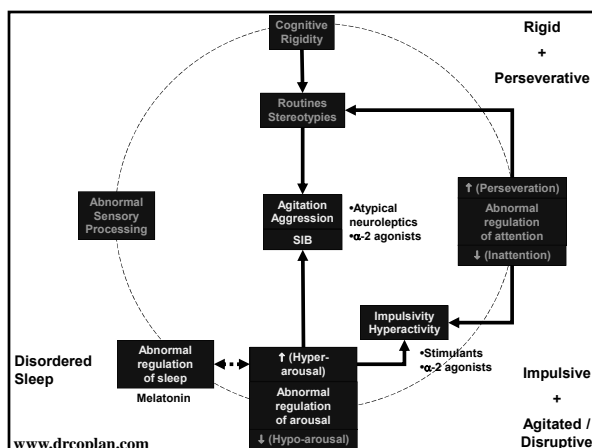
- **Abnormal melatonin cycling**
  - Primary disorders of sleep
  - Blindness
  - ASD
- **Symptoms**
  - Delayed onset of sleep
  - Shortened duration / frequent waking

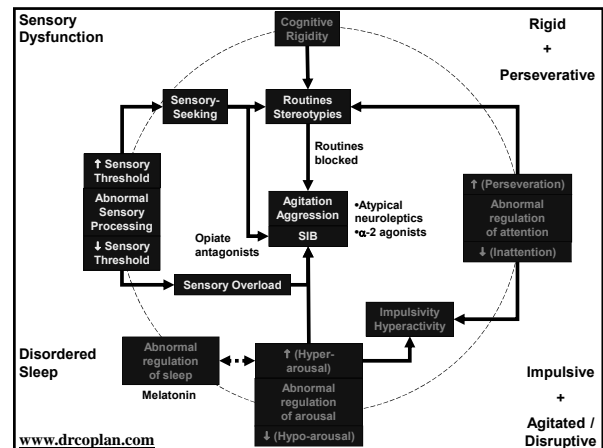
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## Regulation of Sleep - 3

- **Shared genetic control**
  - Regulation of sleep
  - Regulation of arousal
- **Family history of sleep disorder**

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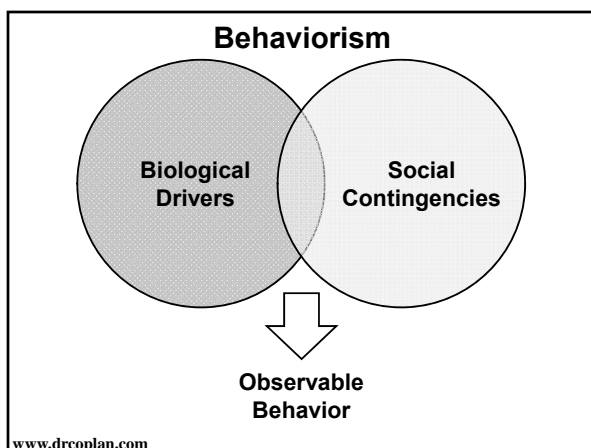
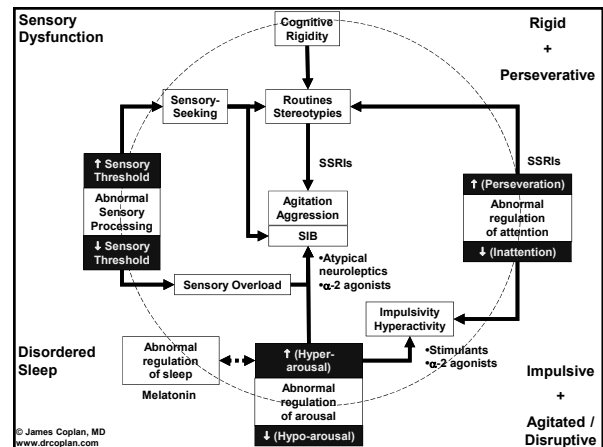




The whole is greater than the  
sum of its parts

Max Wertheimer

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### Behaviorism made simple

STIMULUS (the Antecedent)



RESPONSE (the Behavior)



The Consequence

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## Antecedents

- **External:**
  - Imposition of a task
  - Change in routine
  - Denial of access to preferred object
- **Internal:**
  - Hunger, Thirst
  - Cognitive Rigidity (anxiety, perfectionism, etc.)
  - Other biological drivers

## Antecedents: A caveat....

- **Behaviorism disregards “private mental events” (“emotions”)**
  - Ignores anxiety, depression, perfectionism
  - Lacking recourse to internal emotional state, Behaviorism tends to infer *task avoidance*, rather than *anxiety avoidance*, as the “presumed function” of many behaviors

## Behavior

- **“Topography”**
  - “What does the behavior look like?”
    - Verbal defiance
    - Task refusal
    - Flopping
    - Property destruction
    - SIB (describe)
    - Eloping
    - Etc...

## 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

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## Food Selectivity

Negative and Positive Reinforcement of unwanted behavior

- **Parent removes non-preferred food ([−] reinforcement)**
- **Parent provides child with his/her preferred food ([+] reinforcement)**
- **Alternatives**
  - *First .....Then*
  - Put refusal on extinction
  - The kitchen is *closed* between meals
  - Desensitization (non-preferred food is on table, on plate, touch, lick, mouth, eat)

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## Consequences 2: Aversives

- **Aversives lead to a *decrease* in the likelihood of recurrence of the antecedent behavior**
- **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

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### Disruptive Behavior: Function & Best Response

- **Attention**
  - 1-2-3 ➔ “Time Out” (T.O.)
- **Access**
  - Never grant access to desired object in response to disruptive behavior
- **Escape**
  - Never permit the child to escape from a task via disruptive behavior.
  - Walk child through task first, *then* ➔ T.O.
  - OR: Simplify the task to a level that the child can achieve, then work back up to the harder task
  - OR: Send child to T.O., and as soon as T.O. is complete, resume the task where you left off.

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### Token Economy: The next step beyond Time Out

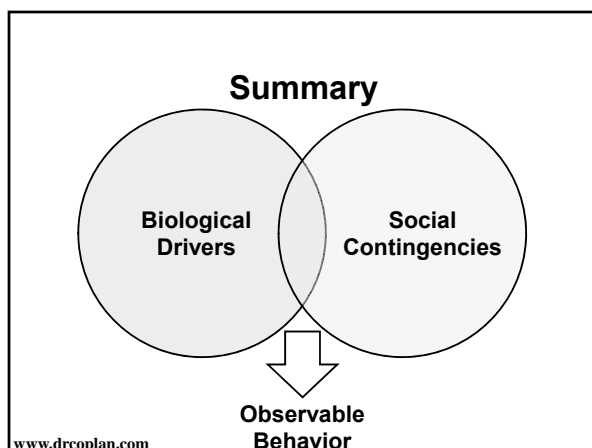
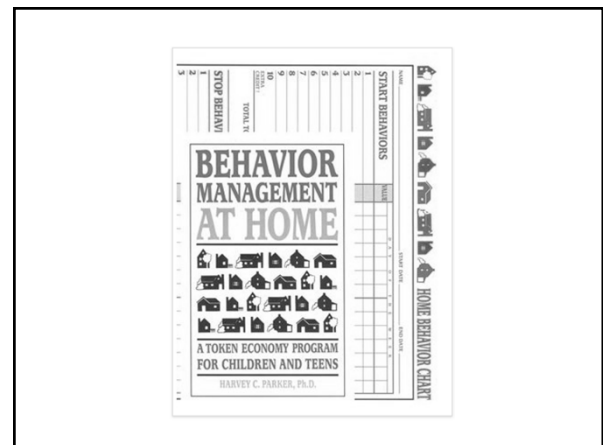
- **Concretely specified behaviors**
- **Earn and Lose Points**
- **Points ➔ Access to preferred items**
  - Preferred toys, Computer time, etc.
  - *NO access to preferred item at other times*
  - “Extra” treats not as effective
- **Works with children who understand rule-based behavior / games**

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**Camp David**  
Trading Post Rules

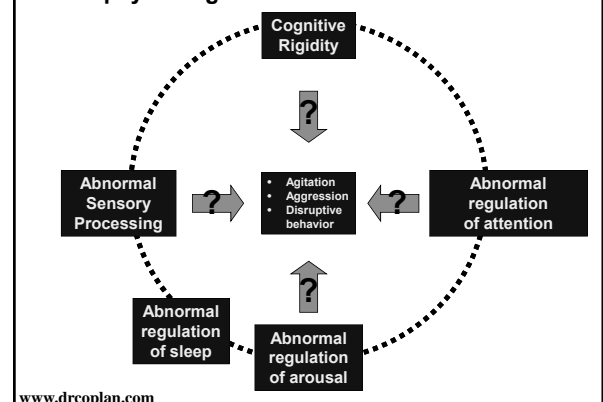
Rewards		Fees	
Good Day	+30	Bad Day	0
Doing Chore - Each	+10	Cursing - Each Time	-20
Doing a Good Deed	+10	Disrespect Parents	-10
Compliment About You	+10	Lies - Each	-20
Do Morning Work (NO Whining)	+10	Don't Do Morning Work (Whining)	-10
Do Pre-Bedtime Checklist	+5	Don't Do Pre-Bedtime Checklist	-5
		Ask More Than Once	-5
		Touch Another Kid or Being Mean	-10

**Red = 5      White = 10      Blue = 50**



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### Neuropsychological Deficits in Children with ASD



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### 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)

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### Summary

- Why this child?
  - Neuropsychological factors?
    - Cognitive Rigidity
    - Dysregulation of attention
    - Dysregulation of arousal
    - Sensory Seeking / Sensory Overload
- Behavioral Intervention – Usually
- Change in classroom setting – sometimes
  - Shift from rote to inferential learning (2<sup>nd</sup> - 3<sup>rd</sup> grade): challenge
- Medication: Sometimes


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Making Sense of Autistic Spectrum Disorders

Behavior management and psychopharmacology  
in children with autistic spectrum disorders

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Colin J. Condron, MD - Care of the Sick Child Conference  
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