

## Domestic Violence & the Teen Brain: Maximizing Toward Complexity

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## OUTLINE

- A. Promises & Pitfalls of Teen Brain Science
- B. The Science: Brain Basics
- C. Adolescent Brain Development: Maximizing Toward Complexity
- D. Teen Risk-Taking & Teens At-Risk
- E. Pathways to Teen Dating Violence
- F. Translating Neuroscience Into Practice

## Promises & Pitfalls

Putting Adolescent Brain Science  
Into Policy & Practice

## Teen Brains in the Media

- “Risky Teen Behavior is All in the Brain,” USA Today, 2007
- “*The Teen Brain: the More Mature, the More Reckless*,” TIME Science 2009
- “*The Teen Brain: It’s Just Not Grown Up Yet*,” NPR 2010
- “*What’s Wrong with the Teenage Mind?*” Wall Street Journal, Jan. 2012
- “*Do Your Teens Seem Like Aliens?*” Frontline website 2012

## Risky Conclusions Lawrence Steinberg

- Teens brains are “too immature” to avoid risky behaviors.
- We are “wasting billions of dollars” in risk prevention programs.
- Favors stricter laws & policies limiting teen behavior (drinking, driving, etc) vs risk-prevention programming.

## Be Wary of Biodeterminism

Michael Males

- Biodeterminism “posits a group as innately limited by unalterable biology.”
- “Obligates the state to take custodial measures to protect society and the inferior group by restricting the freedoms and behaviors of those pronounced inherently incapable of controlling themselves.”

### Proceed With Caution

Judith Bessant: "Hard-Wired for Risk"

We need to distinguish between:

- the research findings themselves,
- how they are interpreted and
- the uses being made of them.

### Why It Matters

- Assumptions about teens having poor judgment/ decision-making lead to policies & practices that are counter-productive...
- Because teens "lose opportunities to develop intuition through experience" which is "critical for good decision-making." (Bessant)

### Redefining the Question

- "The main challenge is to establish how and in what ways social learning and social experiences interact with the physiology of the brain." (Bessant)
- This has significant implications for those of us working with teens exposed to Domestic Violence.

Johnson, Blum & Giedd (2009), "Adolescent Maturity and the Brain: The Promise & Pitfalls"

- "Illuminate the great strengths and potentialities of the adolescent brain"
- Identify "the conditions under which adolescents' competence, or demonstrated maturity, is *most vulnerable and most resilient.*"

### Why I LOVE Working with Teens

- Brain Changes → Resilience
- Changing = Changeable!
- Openness to New Experiences
- Openness to Questioning
- Responsive to Environment
- Less Rigidity/ More Flexibility than adults

### Reciprocity of Brain & Mind

- **The Brain Leads the Mind:** biology underpins our thinking and behavior
- **The Mind Leads the Brain:** our thinking, experience and behavior shape our biology!

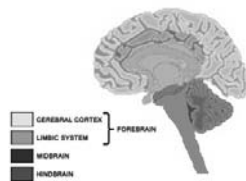
Dan Siegel, Mindsight

### Our Goals Today

1. Understand the science (including the limitations of science)
2. Understand the implications for teen behavior
3. Consider how to translate neuroscientific findings into our services and policies.

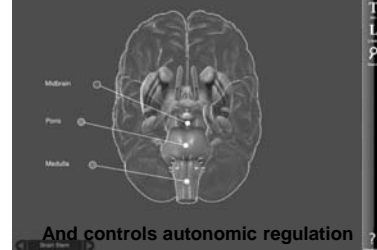
### The Science: Brain Basics

### Brain Basics: The Triune Brain



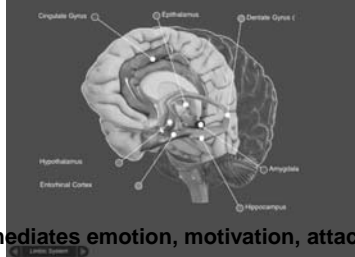
### 1. The Brainstem ("Reptilian Brain")

**Brainstem connects & integrates brain/body**

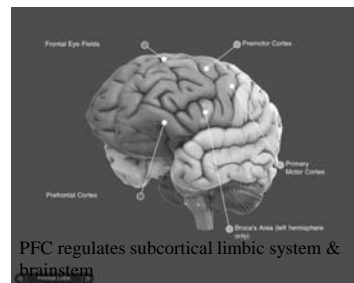


### 2. The Limbic System ("Feeling & Reacting Brain")

**Limbic System evaluates experience & stress**



### 3. Cortex & Pre-Frontal Cortex: Executive Functions



### Hand Model of the Brain Dan Siegel



### Lessons from Affective Neuroscience

1. Emotion is a super-fast appraisal and response system that allows us to rapidly assess and respond to stimuli in our environment without having to “think”

### Lessons from Affective Neuroscience

2. Our limbic system is keyed in to detect dangers, and then prime our responses;
3. The limbic system is essential to understanding and working with victims of trauma... and offenders.

### Stephen Porges: Centrality of Safety & Danger

- Feeling safe is a necessary prerequisite before individuals can develop, nurture and sustain social engagement;
- Conditions of safety, danger & life threat trigger one of three neurological circuits that form a response hierarchy

### Polyvagal Theory Stephen Porges



### Three Neural Circuits Stephen Porges

SAFETY	DANGER	LIFE THREAT
Ventral Vagal	Sympathetic NS	Dorsal Vagal
Rest & Digest	Fight/ Flight	Shut Down
Regulation	Hyper-Arousal	Hypo-Arousal
Social Engagement	Reactivity	Withdrawal

### Siegel: Hand Model of the Brain

### PFC's Integrative Functions (D. Siegel, Developing Mind)

1. Bodily Regulation (SNS, PNS)
2. Attuned Communication
3. Emotional Balance
4. Response Flexibility
5. Fear Modulation
6. Empathy
7. Insight
8. Moral Awareness
9. Intuition - the wisdom of the body

### Why is Integration Important?

- “Integration—the linkage of differentiated elements of a system—illuminates a direct pathway toward health.”
- “Integration is the key mechanism beneath both the absence of illness and the presence of well-being.”

Dan Siegel

### Maximizing Toward Complexity Dan Siegel

- Without integration, “the entire system moves away from complexity—away from harmony—and into rigidity” (linkage without differentiation) or chaos (differentiation without linkage).
- This is true for all systems: brains, bodies, relationships, families, social systems, etc.

### Adolescent Brain Development

Maximizing Toward Complexity

### Public Policy & Neuroscience Johnson, Blum & Giedd

Proceed cautiously in applying scientific findings to prevention & intervention policy:

- Be wary of age-based definitions of neurological maturity, they are mostly “developmentally arbitrary”
- There is a lack of empirical support for causal relationship between neuro-maturational processes and behavior

### More Words of Caution

- Teen Brains must be understood in Context: the brain is designed to interact with - and be shaped by - the environment
- Interactive influences to consider: SES, parenting, individual agency, nutrition, culture, psychological well-being, physical environments, relationships, and the interactions of all these factors.

### SO WHAT DO WE KNOW ABOUT TEEN BRAIN DEVELOPMENT?

#### 1. Pre-Puberty: Brain Growth

- Throughout childhood, cortical areas thicken, neural connections proliferate
- Gray matter volume in frontal cortex peaks at age 11 (girls) and 12 (boys)
- Scientists don't all agree about what the peak in gray matter volume means

#### 2. Adolescence: Pruning

- Synaptic pruning/ structural changes make brain more efficient in response to the demands of the environment
- Surviving neural connections become quicker & more efficient (linkage)
- Brain regions become increasingly specialized (differentiation)

#### 3. Experience Changes the Brain (Siegel)

- Genes & experiences shape how neurons become connected to each other
- Synaptic Pruning is not random, nor predetermined: when connections are not used, they disappear!
- Brain changes may not be the same across individuals, history and cultures

#### 4. PFC and the Maturing Brain

- Teens' PFCs are being remodeled
- PFC mediates limbic responses
- As the PFC matures, it grows fibers down to the amygdala, which inhibit and regulate automatic responses... and enables greater response flexibility

**Teen Risk-Taking & Teens At-Risk**

Nature + Nurture → Teen Behavior

- Teen Behavior: Fact or Hype?**
- “Risky, impulsive behaviors”
  - “Recklessness”
  - “Bad decision-making”
  - “Difficulty achieving long-term goals”
  - “Poor planning & judgment”
  - “Thrill-seeking”
  - “Difficulty controlling emotions”
  - “Irrational and dangerous” behavior

- Johnson, Blum, Giedd:  
What We DO Know**
- Three adolescent behavior changes that are seen across cultures, and species:
1. Increased novelty-seeking
  2. Increased risk-taking
  3. Social affiliation shift toward peer-based interactions
- NOTE: All are evolutionarily adaptive.  
And all are relevant to DV risk.

- Why the Increase in Teen Risk-Taking?**
- Risk-Taking is NOT due to faulty decision-making (which actually improves in adolescence)
  - “Adolescents engage in dangerous activities *despite* knowing and understanding the risks involved.”
  - Steinberg’s Theory: that risk-taking is impacted by affective arousal (“Hot Cognition”)

- Risk-Taking or At-Risk?**
- Steinberg & others suggest that teens take more risks – and are more prone to violence – because they are more vulnerable to hot cognition
  - In fact, teens exhibit FEWER high-risk bxs (suicide, drugs, accidents) than adults.
  - Teen high risk behaviors are highly concentrated in certain environments (nurture vs nature).

- AT Risk: Teens Especially Vulnerable to Environment?**
- Prior to maturation of PFC, teens may respond more directly with their subcortical areas (ie; limbic system/ amygdala)
  - Teens’ PFCs may not work as quickly to inhibit amygdala’s responses
  - Teens may be more reactive - and more impulsive - when limbic system is engaged
- Dan Siegel

### Vulnerability to Interpersonal Reactivity (Siegel)

- Mirror neurons allow us to “soak in” another person’s response and thereby feel another person’s inner life.
- And without the regulating function of the PFC, our resonance with others’ emotions may also lead to escalating negative interactive cycles (conflict).
- Consider impact of exposure to violence

### Cultural Context and Lived Experience Shapes the Brain

Allan Schore:

- Dominant experiences of separation, distress, fear and rage create neurological pathways that lead to ongoing relational patterns of affect dysregulation, relational deficits, etc.

### Intergenerational Transmission of Trauma

- Early adverse attachment experiences
- ➔ Development of neurological pathways
- ➔ Impaired self-regulation capacities
- ➔ Pattern of relational deficits
- ➔ Next Generation

### Lynn Fainsilber-Katz: “DV & Vagal Reactivity to Peer Provocation”

- “Conduct-problem children who showed vagal augmentation to interpersonal challenge came from families with the highest levels of domestic violence”
- Children with conduct problems have been found to be hypervigilant to perceiving interpersonal threat

### Exposure to Relational Conflict ➔ Vagal Reactivity

- Hypervigilance to interpersonal negativity is as an adaptive response to a threatening environment;
- Even “mild” interpersonal negativity may signal escalation in conflict, and thus can trigger reactivity;

### Neurological Impact of Childhood Exposure to DV

- Increased interpersonal negativity
- Increased hostility & interpersonal control
- Increased reactivity
- Decreased conflict resolution
- Decreased interpersonal soothing
- Can Lead to:** Difficulties with emotional expression, ineffective interpersonal strategies, inappropriate social behaviors



**LF-K: Adverse impact of child abuse and DV exposure**

- Abused children take longer to disengage from angry facial expressions
- Perceive angry faces as highly salient and more distinctive vs other faces
- Require less visual information to detect anger

**Pathways to Teen Dating Violence**

**Neuroscience & Teens At-Risk for DV Relationships**

- What are the neurobiological factors that contribute to teens being at risk for victimization and/or offending in intimate relationships?
- How can neuroscience inform primary prevention and treatment for both victims and offenders?

**Debra Pepler (2012): The Development of Dating Violence**

- “What role relationships play in guiding youth onto troubled pathways, and...”
- “Conversely, what role relationships can play in diverting youth onto healthy development and relationship pathways”

**Pepler: Pathways to IPV Risk**

- **Social:** International research shows a “strong association between national levels of income inequities and IPV”
- **Family:** Interparental and parent-child violence associated with increased risk for both aggression and victimization

**Pepler: Pathways to IPV Risk**

- **Peer Group:** Youth in deviant groups reinforce each others’ interpersonal dysregulation and hostile/ violent behavior
- **Bullying:**
- **Romantic Relationships:** dysregulation, hyperarousal, and insecure attachment patterns may exacerbate IPV

**Pepler: What Doesn't Develop on the Pathway to IPV?**

- Lack of development in self-regulation for youth who are both anti-social (peer violence) and engage in Dating Violence
- Less capacity for executive function, cold cognition and effective social problem solving
- Increase in impulsive, uninhibited social behavior

**Pepler: What Does Develop That Contributes to IPV?**

- IPV as an adaptive strategy for status, dominance, or control
- IPV linked to elevated stress responses, and hypervigilance to hostile interactions
- Difficulty regulating arousal
- Insecure attachment, internal working models fostering hostile attributional bias

**The Neurobiology of Revictimization Risk**

- Faulty Neuroception? Survivors of prior traumas may have faulty fear detection, and may miss or overlook danger cues;
- Traumatic Attachments: In the “Honeymoon Phase,” bonding occurs under an illusion of safety, and once the victim is conditioned to respond to the abuser as a source of comfort, **neurologically, safety trumps fear!**

**Why (Neurologically) Do Victims Stay?**

- **Fear of leaving may trump fear of staying;**
- **Disorganized Attachment: source of danger may also be source of comfort;**
- **Hyper- and hypo-arousal may interfere with cognitive and behavioral functioning;**
- **Plus all the practical, social and cultural reasons why it's hard to end abuse!**

**Translating Neuroscience into Practice**

Criminology, Prevention & Intervention

**Neuroscience & Criminology Amanda Pustilnik**

- ✓ Helpful: Neuroscience may enhance rehabilitation, and scientifically-informed batterer's intervention treatment;
- ✓ Harmful: Scientific reductionism can lead to potentially dangerous claims, such as proposing a biological basis for terrorism, or a propensity for violence among certain groups.

**Promising Areas in Criminology & Neuroscience**

Our evolving understanding of emotion & behavior could inform violence prevention, intervention, treatment and rehabilitation:

- ✓ Understanding conditions that provoke aggression can help us design systems to minimize violence & risk exposure;
- ✓ Treating emotional reactivity could interrupt risky developmental pathways & intergenerational cycles of abuse.

**Promising Areas in Criminology & Neuroscience**

Enhanced understanding of brain plasticity & development might inform differential treatment of juvenile offenders.

- ✓ Do juveniles in fact have diminished culpability for criminal behavior?
- ✓ Are they more amenable to rehabilitation?
- ✓ What is the impact of punishment on the developing brain?

**Goals for IPV Prevention & Intervention - Debra Pepler**

1. Develop teens' relationship capacities (self-regulation, empathy, conflict resol.)
2. Promote positive relationship models (incl. intervening in family DV/abuse)
3. Promote positive interactions between youth and others (support adults in providing regulation, secure attachment)
4. Intervene early!

**Neurobiology-Informed Services for All Disciplines**

1. Create Conditions of Safety
2. Employ Social Engagement System
3. Support Teens in Developing from Reactivity to Responsiveness

**1. Create Conditions of Safety**

- Recognize that "our nervous system is continuously evaluating risk in the environment" (Porges)
- Reduce/ eliminate sensory triggers
- Be aware of peripheral vision, vocal tone, body boundaries

**2. Employ Social Engagement System (Porges)**

- Provide interpersonal cues of safety to shift teens from neurological conditions of danger to safety
- Regulate ourselves in order to provide affect regulation for teens
- Support teens in using others and/or objects to create conditions of safety in environment and to self-regulate

### 3. Support Shift from Reactivity to Responsiveness

- Demonstrate attunement in recognizing victims' s symptoms & arousal states with respect, normalization (avoid shaming!)
- Support integration of affect and meaning
- Naming a response may create connections between cortical & subcortical regions, and tame the response (*"name it to tame it"*). (Siegel)

### It is Up to Us to Reduce Teen Risk & Enhance Resilience

Think about where your own professional role intersects with the factors that contribute to adolescent risk and resilience:

- What trainings, policies & procedures can you implement to identify & reduce risk?
- What trainings, policies & procedures can you implement to enhance opportunities to build resilience for children, teens and their families?

### Intergenerational Transmission of Trauma

- Early adverse attachment experiences
- Development of neurological pathways
  - Impaired self-regulation capacities
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**Where Can You Intervene in the Cycle?**

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