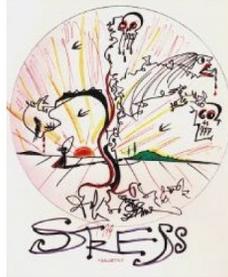


Toxic Stress and Its Impact on Families and Home Visitors

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Stress, 1979
Salvador Dali for Hans Selye

“The quiet child is not a content child.”

Cohn, 2011

“The concept of disrupting brain circuitry is much more compelling than the concept that poverty is bad for your health ... It gives us a basis for developing new ideas, for going into policy areas...and saying here are some new strategies worth trying.”

Shonkoff, J., 2011

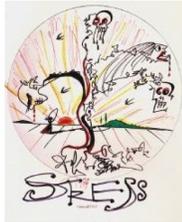
Introduction: Why Toxic Stress?

- Survey results, new people in field
- Topic is both new and old
 - 1920s - 1950s: Bakwin, Goldfarb, Spitz, Anna Freud, Robertson
 - Recognition that development can be compromised by stress but **pathways unknown**
- Stress as a field of research
 - 1930s - today



Critic of Hans Selye's early work

"Stress, in addition to being itself, was also the cause of itself, and the result of itself."



Observed by Rene Spitz, 1946

- Grief: A Peril in Infancy
- Hospitalism
- Mirasmus
- Failure to thrive



Examples from Orphanages

- Romania, 1990s



Often Observed by Home Visitors



Stress

- “Stressors are events or conditions that threaten, or are perceived to threaten, physiological equilibrium... They involve activity in the central nervous system to mobilize endocrine, autonomic, and behavior systems to support protection from and/or adaptation to threat.” Gunnar, 2005
- “A stressor is anything in the outside world that knocks you out of homeostatic balance.” Sapolsky, 2004

The Stress Continuum

- Normative
 - Stress that is essential to development
- Tolerable
 - Significant adversity managed through effective coping skills and relationships with adults
- Toxic
 - Excessive, prolonged activation of stress response in the absence of the buffering presence of protective and supportive adult



THIS AMERICAN LIFE FROM WBEZ



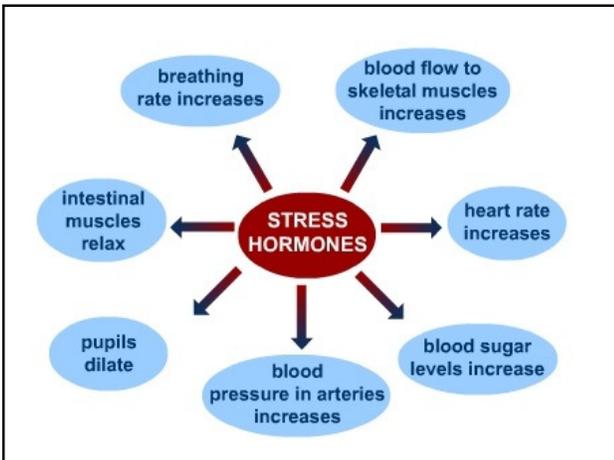
474: Back to !
SEP 14, 2012

As kids and teachers head turn away from questions : money and all the regular t about, and turn to somethi emerging theory about wh Tough's new book *How G takes the marshmallow tes*

DOWNLOAD TRANSCRIPT FAVORITE HEARD IT TWEET LIKE

What is the Stress Response?

- **Stressor** occurs: May be external or internal
- **First response: Adrenal glands (on top of the kidneys) release adrenaline.** Adrenaline rushes throughout the body and throws a series of cellular switches:
 - **Heartbeat and breathing quicken**
 - **Blood pressure rises**
 - **Liver releases stored blood sugar (glucose) to provide energy**
 - **Blood flow is diverted to the brain and major muscles. Running is faster, thinking is sharper.**
 - **Energy and blood flow are diverted away from digestion, growth, reproduction, and tissue repair.**



Stress Response

- Ten minutes after the stressor, **second response: HPA axis**
- The HPA axis relies on a series of hormonal signals to activate the **sympathetic nervous system** (“gas pedal”).
- If the brain **continues to perceive** something as dangerous, the hypothalamus and pituitary gland release hormones that travel to the adrenal glands.
- The adrenal glands are prompted to release **cortisol**.
- In response to cortisol, the body goes into high alert. When the threat passes, cortisol levels fall. **The parasympathetic nervous system** (“brake”) slows the stress response.

Three Core Concepts in Early Development

3 Toxic Stress Derails Healthy Development

NATIONAL SCIENTIFIC COUNCIL ON THE DEVELOPING CHILD
Center on the Developing Child HARVARD UNIVERSITY

Key Concepts: Toxic Stress and Development

- “Even when there is no apparent physical harm, the **extended absence of response from adults** can activate the stress response system.”
- “**Constant activation of the stress response overloads developing system**, with serious, lifelong consequences for the developing child. This is known as **toxic stress**. Over time, this results in a **stress response system set permanently on high alert**.”
- “In the areas of the brain dedicated to learning and reasoning, the neural connections that comprise brain architecture are **weaker and fewer in number**.”
- “Prolonged activation of the stress hormones in early childhood can actually **reduce neural connections** in these important areas of the brain at just the time when they should be growing new ones.”

Stress Response: From adaptive to maladaptive

- Too much cortisol **damages connections between neurons** and dramatically **reduces the rate** of manufacture of new neurons.
- Both of these processes affect the neurons of the hippocampus, causing reduction of storage and retrieval of memory.
- **Amygdala:** Same sequence has opposite effect on amygdala, a brain structure that mediates emotions. Amygdala has both CRH and glucocorticoid receptors and can set up a feedback loop that results in a larger amygdala that is hyper-responsive, chronically activated, and increases propensity toward fear and anxiety.

"It is in this way that a child's environment and early experiences get under the skin."

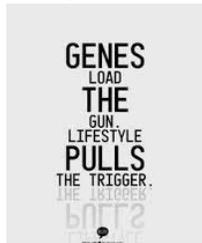
Shonkoff, J. 2012

"Adverse or positive early life experiences lead to 'biological embedding' via gene-environment interplay, and shape the brain and body; in the end, they bias the individual to react in certain ways to stressors generated both externally and internally."

Karatoreos & McEwen, 2013

Gene/Environment Interplay

- Affects which genes are turned on and off, when and where
- Environment/experience influences how the genetic blueprint is read and used
- Effects can occur at the molecular level
- Stress can create changes in epigenetic markers



Gene/Environment Interplay: Two Types of Plasticity in Brain

- Synaptic: How strong the connection is
 - “From a whisper to a shout”
 - Can increase in strength throughout life
- Cellular: How many connections are made
 - “From one person shouting to a stadium”
 - Declines dramatically after age 5

“It is as if experiences confer a “signature” on the genome to authorize certain characteristics and behaviors and to prohibit others.”

Shonkoff, J. 2012

Stress Response

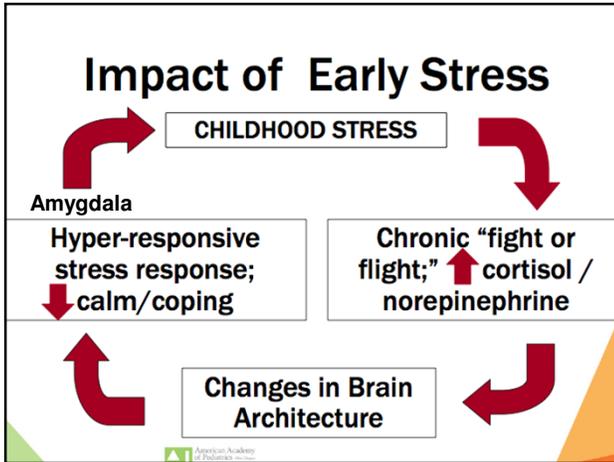
- **Prefrontal cortex:** Last part of the brain to fully develop. Chronic activation of stress response causes atrophy of neurons, leading to disconnected circuits.
- Stress creates “bottom up” rather than “top down” control:

“ Under conditions of psychological stress the amygdala activates stress pathways in the hypothalamus and brainstem, which evokes high levels of noradrenaline and dopamine release. This impairs prefrontal cortex regulation (PFC) but strengthens amygdala function, thus setting up a 'vicious cycle'....”

[S]tress impairs higher-order PFC abilities such as working memory and attention regulation. Thus, attention regulation switches from thoughtful “top-down” control by the PFC that is based on what is most relevant to the task at hand to “bottom-up” control by the sensory cortices, whereby the salience of the stimulus (for example, whether it is brightly colored, loud or moving) captures our attention.

The amygdala also biases us towards habitual motor responding rather than flexible, spatial navigation. Thus, during stress, orchestration of the brain’s response patterns switches from slow, thoughtful PFC regulation to the reflexive and rapid emotional responses of the amygdala and related subcortical structures.”

Arnsten, 2009



“...[R]epeated exposure to threatening situations can disrupt the development of the prefrontal cortex and lead to emotional problems as well as compromised working memory, attention, and inhibitory control.”

Shonkoff, 2012



Stress and Disease

- Excessive activation of stress response system in early childhood plays important causal role of adult disease
- Accumulated heavy load on the body: “Allostatic load”
- Compromises the functioning of the immune system and increases inflammatory processes
- We can now view many common adult diseases as **developmental disorders beginning prenatally and in early childhood**



- Our goal is **not to eliminate all stress** but rather to **strengthen the capacity of parents** and other caregivers to build adaptive capacities and coping skills of children whose life circumstances impose extensive threats to their well-being.
- **Resilience depends** upon the availability of adults who can help young children **restore physiological homeostasis** by bringing their stress response back to baseline.



Adverse Childhood Experiences

- Large study sponsored by CDC and Kaiser Permanente
- Found that the more ACEs in childhood, the stronger the link to poor outcomes in adulthood
- 4+ ACEs are reported by 15% of American women
- Linked to serious health and behavioral difficulties

Adverse Childhood Experiences

- Recurrent physical abuse
- Recurrent emotional abuse
- Contact sexual abuse
- Emotional neglect
- Physical neglect
- An alcohol and/or drug abuser in the household
- An incarcerated household member
- Someone who is chronically depressed, mentally ill, institutionalized, or suicidal
- Mother is treated violently
- One or no parents

Adverse Childhood Experiences Are Common

Household dysfunction:

Substance abuse	27%
Parental sep/divorce	23%
Mental illness	17%
Battered mother	13%
Criminal behavior	6%

Abuse:

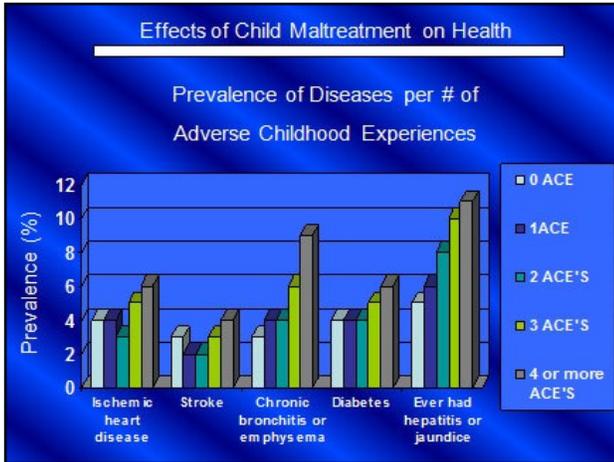
Psychological	11%
Physical	28%
Sexual	21%

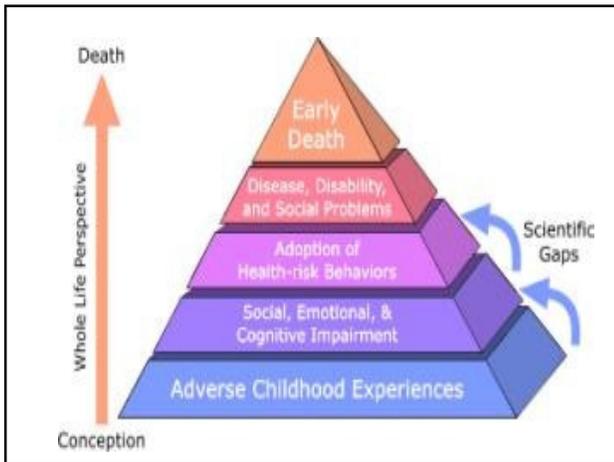
Neglect:

Emotional	15%
Physical	10%

ACE Outcomes

- Alcoholism and alcohol abuse
- Chronic obstructive pulmonary disease (COPD)
- Depression
- Fetal death
- Illicit drug use
- Ischemic heart disease (IHD)
- Liver disease
- Risk for intimate partner violence
- Multiple sexual partners
- Sexually transmitted diseases (STDs)
- Smoking
- Suicide attempts
- Unintended pregnancies





Toxic Stress and Parenting

- Think about the capacities we need to parent:
 - Consider needs of child
 - Consider feelings of child
 - Put our own needs second
 - Plan, problem-solve, think flexibly
 - Take the child's perspective
 - Manage arousal in the face of provocation
 - Stay in connection even when upset, sustain relationship over time
 - Derive some pleasure or satisfaction from parenting




Biodevelopmental Influences on Parenting

- With chronic stress:
 - Amygdala is over-activated, leading to **high arousal**
 - Hippocampus has fewer neurons: **Poor memory**
 - Prefrontal cortex: Last wired, most affected by experience, poor connections, leads to **faulty judgment**
 - “Bottom up” decision-making rather than “top down”
 - Dopamine system is depleted, **decreasing pleasure, maintenance** of parenting
 - May affect oxytocin levels in children, affecting the **parenting of the next generation**



Biodevelopmental Influences on Parenting

“Early maternal caregiving appears to play an important role in programming both the oxytocinergic and dopaminergic neuroendocrine systems in infancy, which then supports maternal behavior in adulthood. **A disruption in these systems at any point in the lifespan may predispose to maternal neglect.**”

Streatham, L., 2011

Parenting and Home Visiting

- So now you have a stressed, agitated, logically compromised parent who cannot focus, remember what you talked about, take perspective, or experience pleasure in parenting...
- Welcome to High Stressed Home Visiting!

How Can You Help?

- **Be bold.** Parents let you in because they want help. They may not know how to put it in words. Do not hesitate to join with the parent, to help them know that you are there **to help them help their child**. Find out what helping means to them and let them know what you can do.
- **Think collaboratively.** Remember that parents WANT to make it better but do not know how. They have an idea about why things are the way they are. Before you make suggestions, find out what they are thinking so that you don't talk at cross-purposes. Don't contradict it - try to understand it and once you do, respect that it comes from someplace important.
- **Share what you know.** Don't be afraid to tell parents what **we have all been learning** because this is an area in which there has been a lot of recent research. Parents may not have any other opportunity to learn how development happens. We can impart information respectfully, relationally, and gently. It's about HOW we say things rather than WHETHER we say things.

Help parents understand that babies and toddlers need help calming themselves just like we adults do. Remind them of how when we have a bad day, we look to find someone to share it with so that we feel better. Help them understand that it's kind of the same except for babies it's **more like minutes** rather than a whole day.

Help parents understand that crying and fussing is communication. It means the child needs something, but it **doesn't mean** that the CHILD knows what it needs or what the message is. It's kind of like a code: The child says something to us in code, and it's up to us to use our decoding minds and experience to translate it into something meaningful. Over time the CHILD learns the code too, but the parent has to learn it first.



- **Teach parents that we each create our own decoding book for each child** and that over time the code becomes easier and easier to understand. (And though each child is unique, experience with other children gives us some basic codes to understand a new child.)
- **Help parents understand that they and their child are creating something unique to them.** Their child learns over time that their parent, and nobody else, has the **decoding book**, and the child becomes confident that any message that the child sends makes sense to that parent.



- **Help parents understand that there is a thing that happens between children and parents that connects them to each other.** Some people compare the thing to an elastic band, an invisible string, or an emotional conveyer belt. My new favorite comes from a client who compared it to an **electrical current** that forms between parent and child. It's what keeps a child from running off or getting wild in public. It's what prevents out of control behavior.



- **Help parents feel it.** Be a regulating partner for the parent by responding to the parent's arousal, helping them put it into words, and helping it get smaller. Help parents FEEL over time that the process with you is the same process that they can do with their children. Help it move from the experiential level to the verbal/shared communicative level. Moving from experience to language helps us feel in charge and capable of change.



Regulation, Reflection, Relationship

- Are embedded into typical conversations
- Do not require specific curricula
- Are part of every home visit, class time, and interaction





Professional Use of Self

- HOW you are is the instrument of change
- Research is clear: Relationship factors matter most in outcome research
 - “How you are is more important than what you do” Pawl, J., UCSF
 - “People don't care what you know until they know you care” Business motto



How Do I Know If I'm Experiencing Toxic Stress?

- Can't sleep/sleeping too much
- Can't eat/eating too much
- Can't think/thinking too much
- Can't feel/feeling too much
- Can't do/doing too much
- Getting sick too much/can't recover



Risks

- Secondary traumatization
- Overload
- Burnout
- Same effects:
 - Forgetfulness
 - High arousal
 - Bottom up decision-making
 - Feelings of hopelessness



How About You?

- Self-care has to be a priority
- We model self-care for parents, including setting boundaries and staying home when sick.
- We make the same excuses our families make, but ours seem more legitimate!



Self-Care Ideas

- Do one thing at a time. Pick one urgent task and work on it. When that is done, move on to the next.
- Be realistic. If you're overwhelmed, learn to say "no."
- Don't expect perfection from yourself. No one is perfect.
- Visualize. Use your imagination to walk through managing stressful situations successfully.
- Meditate. Five to ten minutes per day can bring some relief. Close your door or go for a quick walk to clear your mind.
- Exercise. Thirty minutes of physical exercise per day can help body and mind. Walk while talking with a co-worker, on a conference call, or during lunch.
- Take a break. Do something you enjoy.
- Get enough rest. No excuses.
- Eat good food. Ditto.
- Limit your intake of alcohol, caffeine, and other substances that disturb your sleep and peace of mind.
- Share your feelings. Don't try to cope alone. Let friends, family, and co-workers provide support.
- Find a mode of expression. Try writing, painting, poetry, music, theater, ceramics, improv, comedy, dance, sewing, wood-working, debating, building, singing, restoring, inventing, cooking, story-telling, drawing, color, design.

Thank you for listening!

- Please give us feedback about this and any other webinar you have attended. Your feedback guides what we do. Thank you for taking time out of your very busy life!



For Further Reading

Cohn, J. 2011. *The Two Year Window*. New Republic.

Early Experiences can Alter Gene expression and affect Long-term Development, Working Paper #10, Center on the Developing Child, Harvard.

Excessive Stress Disrupts the Architecture of the Developing Brain, Working Paper #3, Center on the Developing Child, Harvard.

Persistent Fear and Anxiety Can Disrupt Young Children's Learning and Development. Working Paper #9, Center on the Developing Child, Harvard.

Sapolsky, R. *Why Zebras Don't Get Ulcers*, 2004

Shonkoff, J. 2012. *The Lifelong Effects of Early Childhood Adversity and Toxic Stress*. Pediatrics, Vol. 129 No. 1.

Tough, P, 2011. *The Poverty Clinic*. The New Yorker.
