Stress and how individuals may develop specific competencies to adapt to consistently stressful environments.

C-FAHR Journal Club and Discussion
Facilitator: Bruce Ellis
Freida Devorah Feldman (1915-2015)

“It’s better to be rich and healthy than sick and poor.”

1924, Detroit, MI

2013, Hollywood, FL
Allostatic Load

- How does repeated or chronic adversity “get under the skin”
  - affect biobehavioral development
  - psychiatric and biomedical outcomes
- In medical literature
  - widely accepted answer to this question.
- Instantiated in models of “toxic stress” (Shonkoff et al., 2012) and “allostatic load” (Lupien et al., 2006; McEwen & Stellar, 1993), answer posits a striking duality:
  - biological responses to stress are usually **adaptive in the short term**, but protracted activation of stress response systems is **maladaptive and toxic in long term**.
Toxic stress causes disruptions of brain structure and function, resulting in dysregulation of physiological mediators

“that are the precursors of later impairments in learning and behavior as well as the roots of chronic, stress-related physical and mental illness” (Shonkoff et al., 2012, p. e236)
Allostatic Load

- Over time, dysregulation breeds pathology (allostatic load)

  • wear and tear of toxic stress and altered stress hormone profiles “inexorably strains interconnected biomarkers that eventually collapse like domino pieces trailing toward stress-related endpoints” (Juster et al., 2011, Development and Psychopathology).
From Allostatic Load to Adaptive Calibration

- Evolutionary perspective: begs the question
  - Why would natural selection have favored organisms that respond to chronic adversity by becoming dysfunctional or dysregulated?*

- Developmental adaptations to high-stress environments should enable individuals to make the best of a bad situation
  - even though “the best” may still constitute a high-risk strategy that jeopardizes the organism’s health and survival.
Life history (LH) theory

- Sophisticated evolutionary model of individual differences and developmental programming
- Used to explain how individuals adapt their physiology, behavior, and reproduction
  - different social and ecological conditions
Poverty; Marital instability; Unsafe housing; violent crime; unpredictability

Harsh, rejecting, insensitive, inconsistent parenting

↑ Sympathetic adrenomedullary signaling; ↓ glucocorticoid feedback sensitivity; ↑ proinflammatory cytokine gene expression

↑ Insecure attachment; ↑ risky-aggressive behavior; ↑ immediate gratification; ↑ shifting attention; ↑ working memory updating

Develops in manner that accelerates puberty, sex, and reproduction

↑ Mating effort
↓ Somatic effort
↓ Mental/physical health

Ecological and Family Context

Childrearing: Infancy & Early Childhood

Autonomic, adrenocortical, and immune signaling

Psychological/Behavioral Development

Reproductive Strategy

Health

Fast LH Strategy

- Poverty; Marital instability; Unsafe housing; violent crime; unpredictability
- Harsh, rejecting, insensitive, inconsistent parenting
- ↑ Sympathetic adrenomedullary signaling; ↓ glucocorticoid feedback sensitivity; ↑ proinflammatory cytokine gene expression
- ↑ Insecure attachment; ↑ risky-aggressive behavior; ↑ immediate gratification; ↑ shifting attention; ↑ working memory updating
- Develops in manner that accelerates puberty, sex, and reproduction

Slow LH Strategy

- Adequate $, resources; Marital harmony/stability; safety; predictability
- Sensitive, supportive, responsive, positively affectionate
- ↓ Sympathetic adrenomedullary signaling; ↑ glucocorticoid receptor expression; ↑ antiviral immune response gene expression
- ↑ Secure attachment; cooperative interpersonal style; ↑ inhibitory control; ↑ working memory capacity; ↑ cognitive and academic outcome
- Develops in manner that delays puberty, sex, and reproduction

↑ Parental effort
↑ Somatic effort
↑ Mental/physical health

Adapted from Belsky et al., 1991
Discussion

- Intervention: Working with or against adaptations to stress
- Declawing the cat?
- Need to understand function to understand dysfunction