

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**.

Allostatic Load

- 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

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

↑ Mating effort
↓ Somatic effort
↓ Mental/physical health

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



Discussion

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