

**Stress, Reactivity, and Self-Regulation:
Implications for a Science of Adolescent Health
and Development**

Bruce E. Compas

Patricia and Rodes Hart Professor

Vanderbilt University

(Some of) David's Take Home Messages

- n Treatments for depression during adolescence can be effective
- n Family context is a moderator of treatment outcome
- n Psychological interventions may influence self-regulatory skills
- n Biological interventions may influence the regulation of biological processes

Resources for a Science of Adolescent Health and Development

I. Stress research

II. Translational research: Self-regulatory processes

- n Cognitive science

- n Executive function and self regulation

- n Psychobiological processes of stress

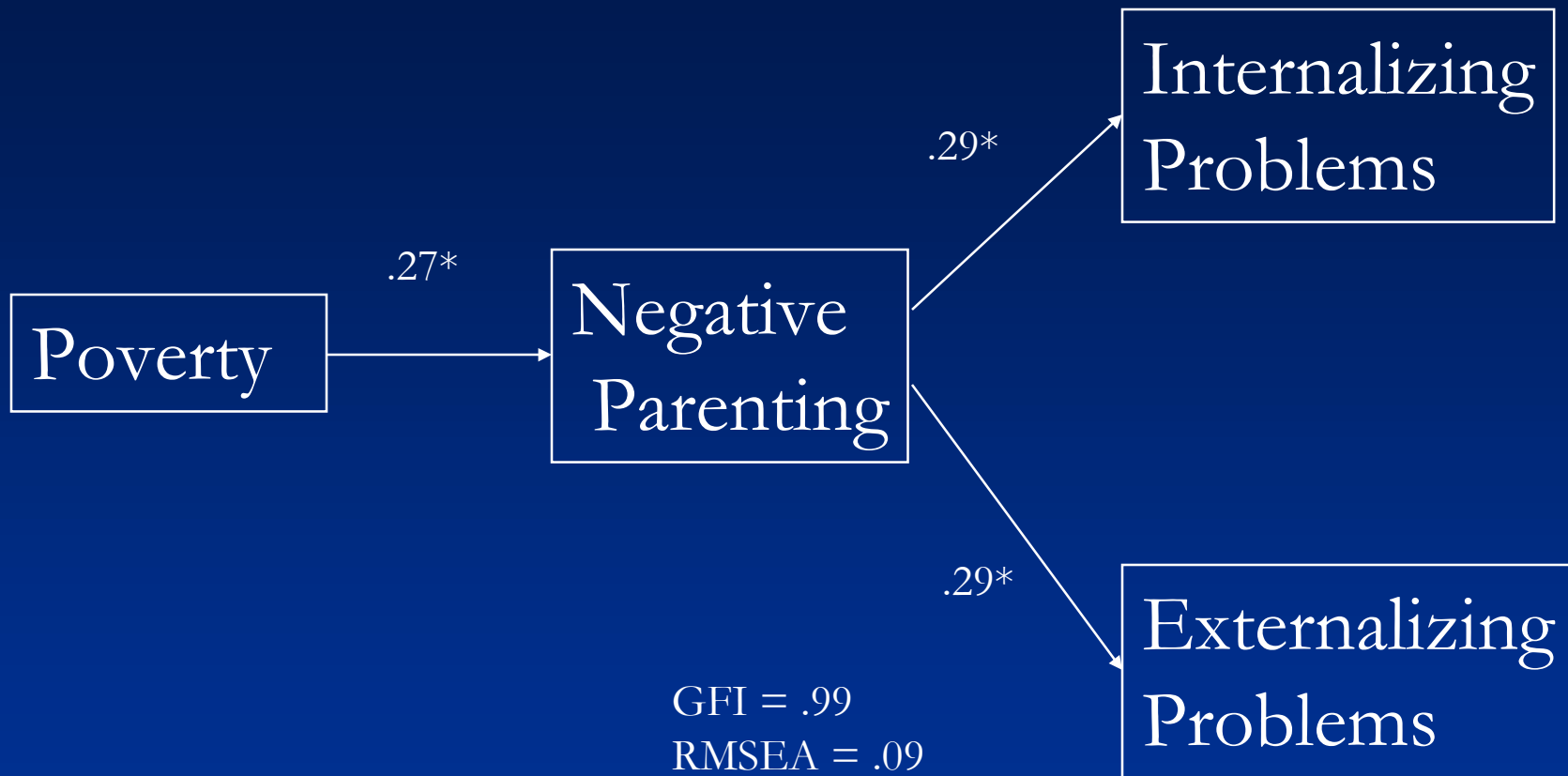
- n Family context

III. Prevention trials

IV. Generalizing from the exception to the population:
survivors of pediatric acute lymphocytic leukemia

I. Stress During Adolescence

- n Recent reviews of literature
 - n Stress predicts increases in symptoms of psychopathology during adolescence (53 prospective studies)
 - n Little or no evidence for specificity in effects of stress
 - n Proximal stressors mediate the effects of distal sources of stress and adversity



(Grant, Compas et al., 2003)

II. Translational Research 1: Cognitive Science

- n Attention includes both automatic and controlled processes
- n Attentional bias reflected in:
 - n Tendency to orient attention toward threatening stimuli (engagement) versus away from threatening stimuli (disengagement)

Attentional Bias: Automatic and Controlled Processes (continued)

- n Presentation of trials of word pairs subliminally (20 milliseconds) and supraliminally (1250 milliseconds)
- n Three types of trials:
 - n Neutral-neutral
 - n Target source of threat-neutral
 - n Alternative source of threat-neutral
- n Bias measured by response latencies to probed neutral and threat words

Attentional Bias Task: Slide 1

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Attentional Bias Task: Slide 2

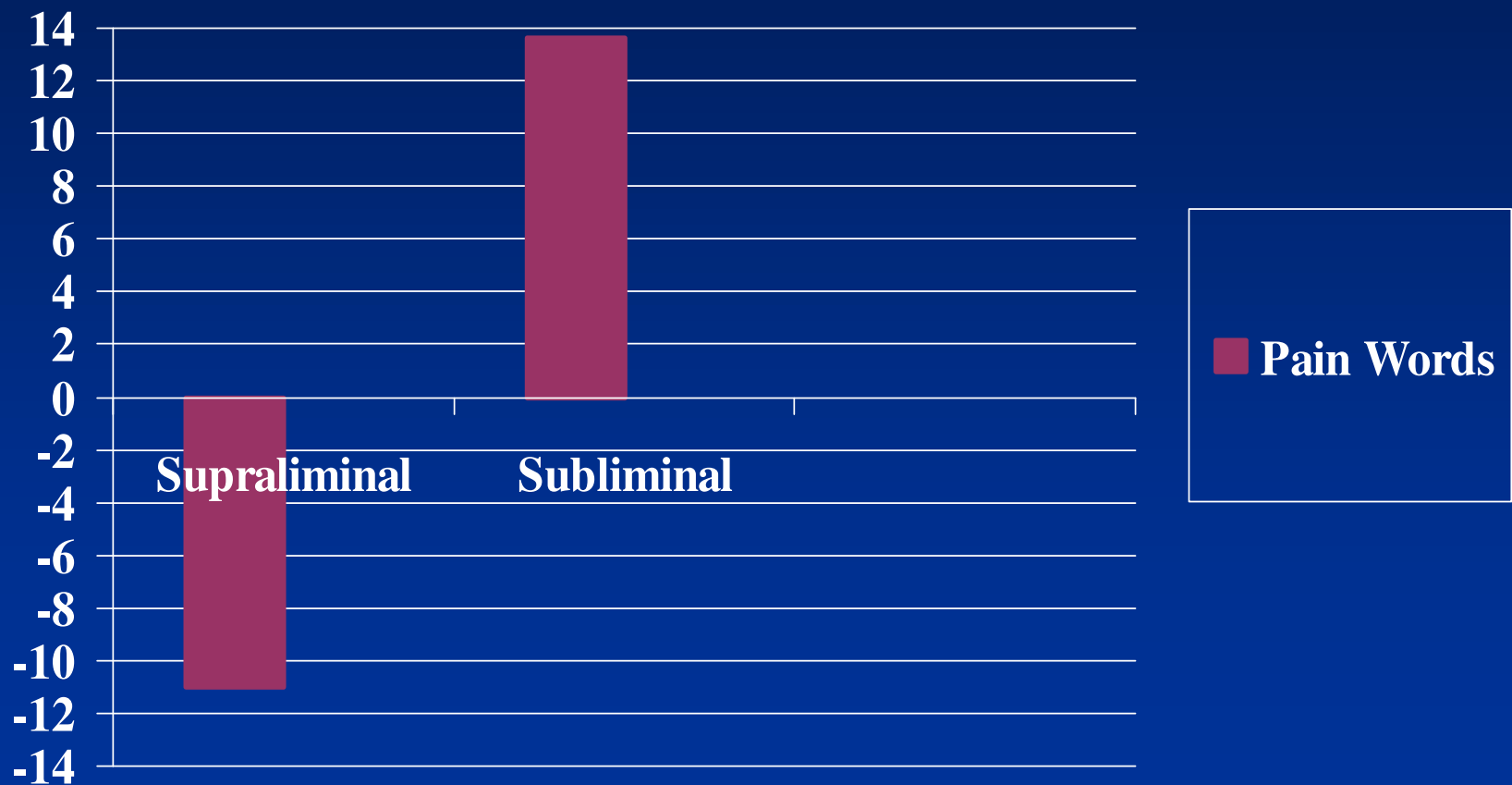
Pain

Lamp

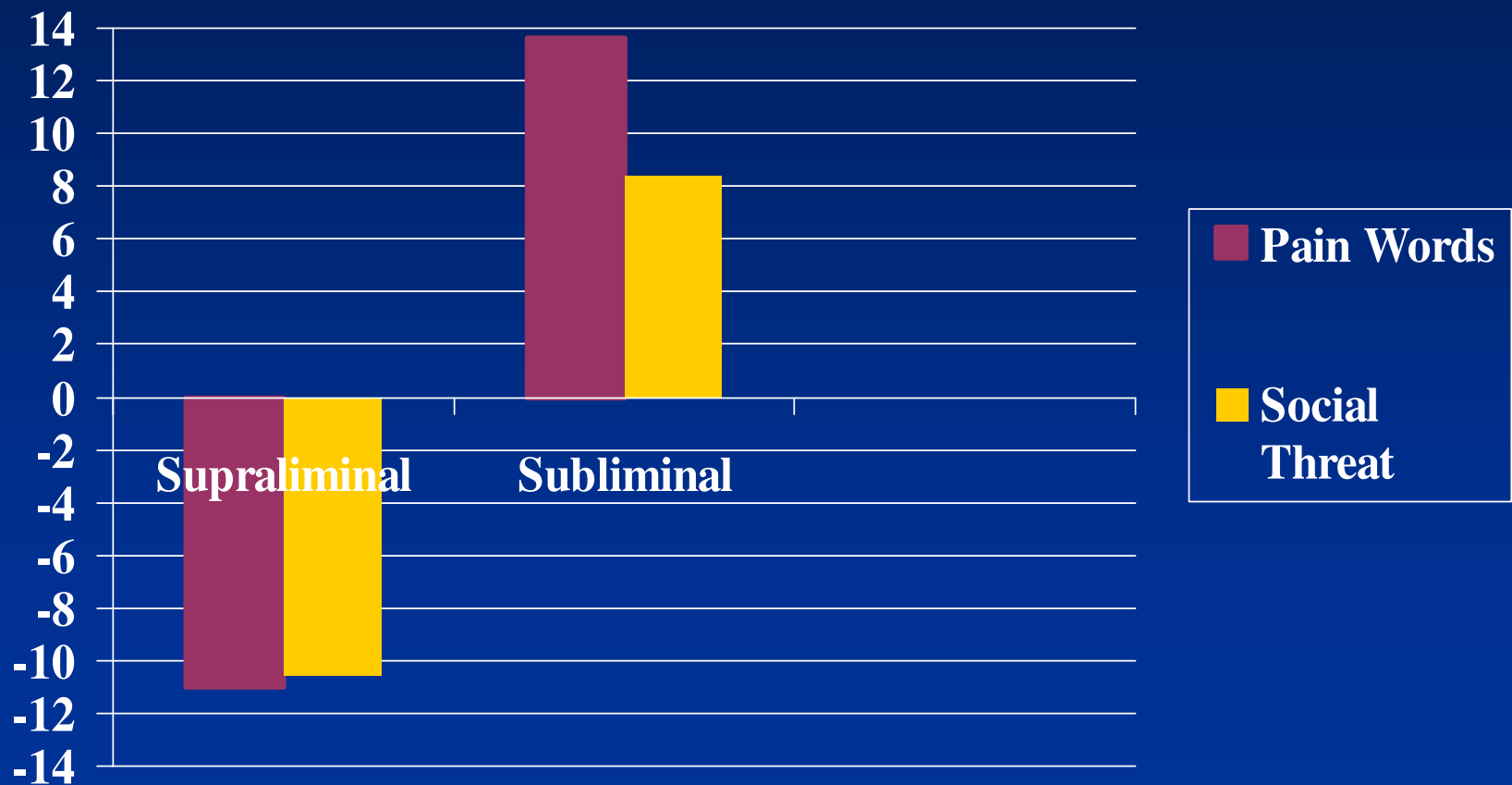
Attentional Bias Task: Slide 3



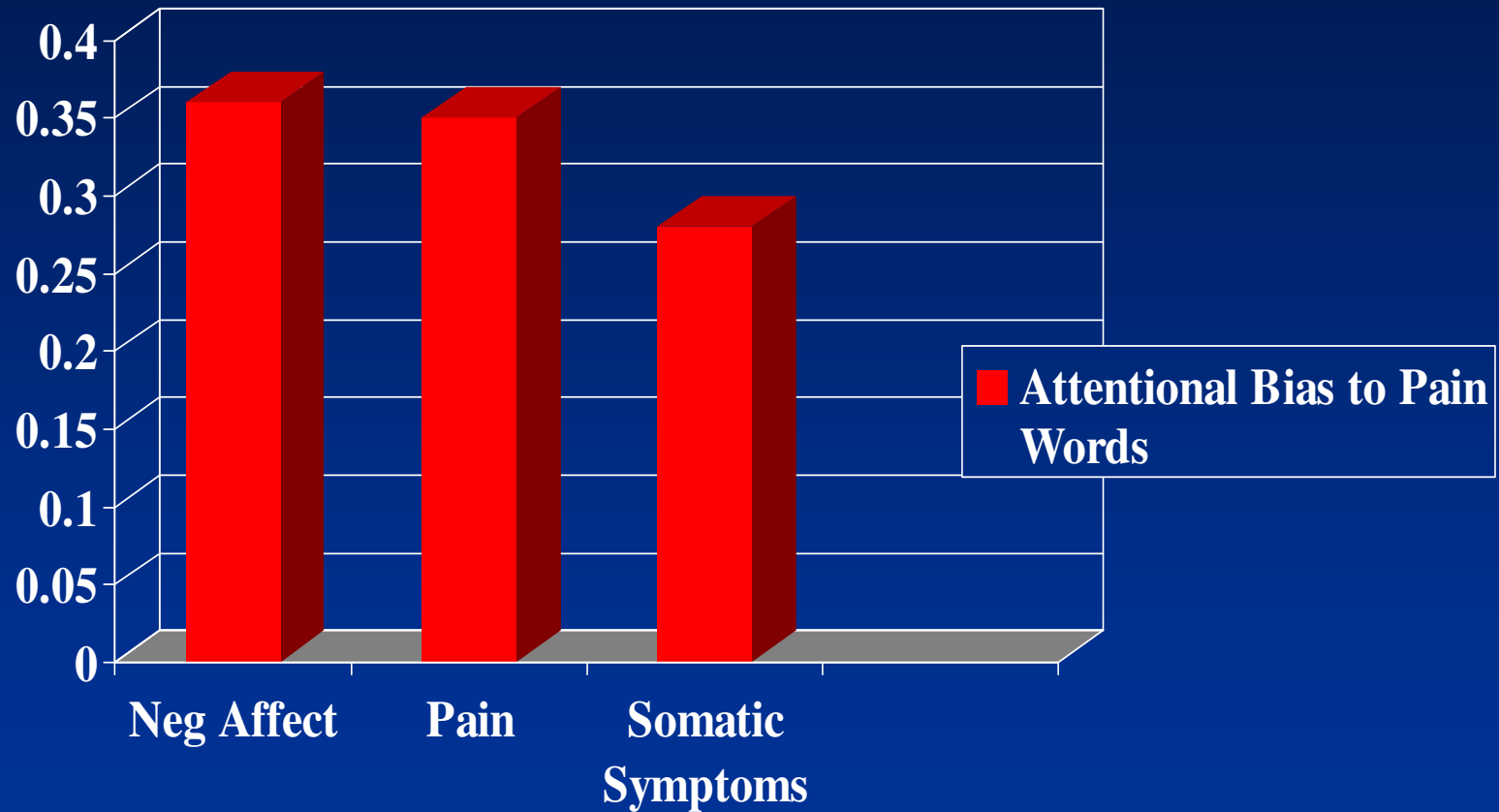
Attentional Bias to Threat: Supraliminal and Subliminal Responses of Pediatric RAP Patients



Attentional Bias to Threat: Supraliminal and Subliminal Responses of Pediatric RAP Patients



Correlates of Subliminal Attention: Pediatric Pain Patients



II. Translational Research 2: Executive Function and Self-Regulation

- n Coping is a controlled process
 - n Coping involves complex cognitive processes
 - n Coping is hypothesized to be related to executive functions of the prefrontal cortex
 - n Test associations between neuropsychological measures of executive function and coping
- (Copeland & Compas, 2003)

Measures of Executive Function: Inhibitory Control

n Go-No Go Task

- n Train response to target stimulus followed by trials that require inhibition of trained response (inhibit prepotent response)

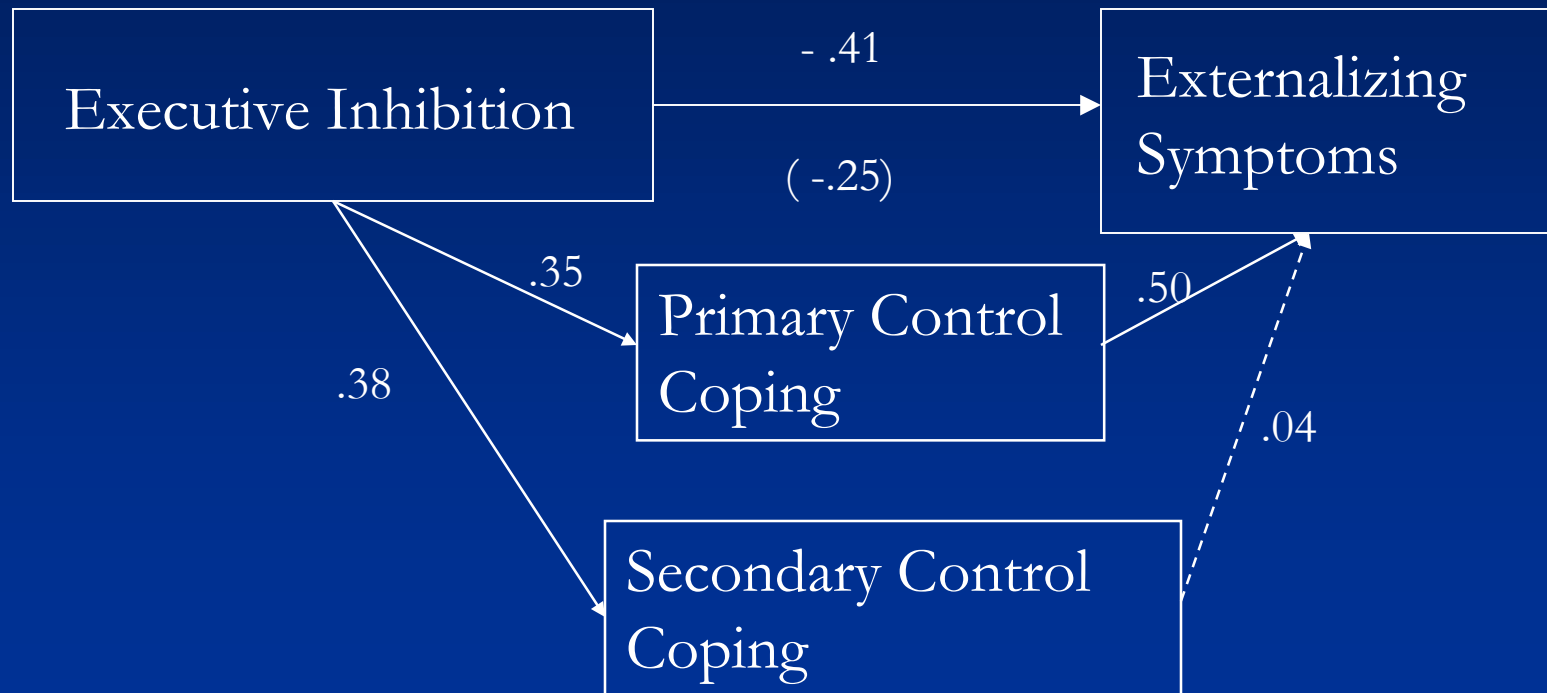
n Stroop Inhibition Task

- n Inhibit response to one feature of stimulus in favor of an alternative response

n Delay of Gratification Task

- n Inhibit response to desired reinforcer

Coping mediates the relation between inhibitory control and externalizing behavior problems

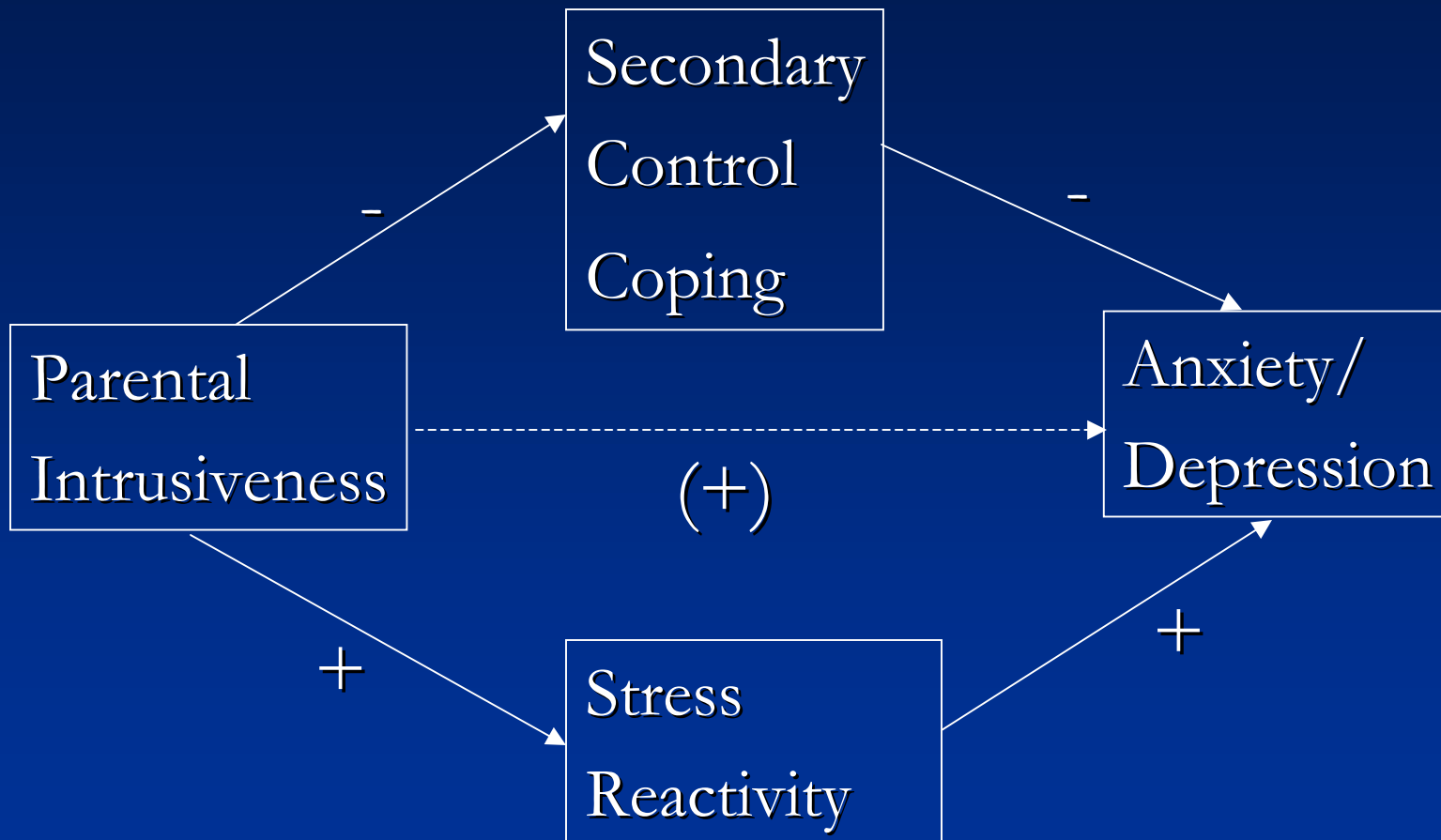


(Copeland & Compas, 2003)

II. Translational Research 3: Family Context

- n Parental depression leads to stressful parent-child interactions
 - n (parental irritability, intrusiveness, withdrawal)
- n Parental depression is associated with marital conflict and discord
- n Stressful family context can disrupt self-regulatory efforts
 - n Increased stressor load disrupted higher order cognitive function
- n Stressful family context can trigger greater reactivity

Coping and Stress Reactivity as Mediators of Parent-Child Stress and Child Symptoms



II. Translational Research 4: Psychobiology of Stress

- n Specificity in activation of HPA response
 - n Tasks that are uncontrollable and self-evaluative threat lead to largest ACTH and cortisol reactivity and slowest recovery (Dickerson & Kemeny, 2004)
- n Specificity in habituation of stress responses
 - n Heart rate, ACTH, and cortisol habituated to exposure to Trier Social Stress Task X three over four weeks
 - n Epinephrine and norepinephrine did not habituate (Schommer et al., 2003)

III. Prevention Trials

- n Prevention trials can inform causal models
- n Prevention trials can explicate mechanisms
- n Example:
 - n Offspring of depressed parents
 - n Mechanisms: stressful parent-child interactions and maladaptive self-regulatory (coping) responses by children/adolescents

Preventive Intervention: Depressed Parents Teaching Parenting and Coping Skills

- n Cognitive-behavioral methods
- n Intervene with children and parents
- n Teach: parenting skills to parents, coping skills to adolescents
- n Group intervention (4 families per group)
- n RCT—comparison with educational control
- n Emphasize homework

IV. From the Exception to the Rule

- n Survivors of pediatric acute lymphocytic leukemia (ALL)
- n Increased survival as consequence of prophylactic intrathecal chemotherapy and synthetic steroids to prevent brain metastases
- n Long-term adverse side effects include significant cognitive impairment (meta-analysis of over 60 studies)

Pediatric ALL Survivors

- n Effects may be due to effects on glial cells leading to demyelination of prefrontal cortex
- n Current study using MRI, fMRI, and DTI to examine white and gray matter deficits
- n Deficits in ALL survivors may inform our understanding of the development of prefrontal region and subsequent deficits in executive function in adolescence

Take Home Messages

- n Stress as a general risk factor for psychopathology and physical illness
- n Reactivity and regulation are central mediators and moderators of stress
- n Reactivity and regulation are governed by context, behavior, and biology
- n Interventions (can) change reactivity and regulation at each of these levels