Nicole Letourneau RN PhD FCAHS
Professor & Palix/ACHF Chair in Parent-Infant Mental Health

THE VALUE OF ASSESSING PARENT-CHILD RELATIONSHIPS:

NCAST parent-child interaction tools

May 17, 2016

Objectives

- Importance of parent-child relationships
- Evolutionary nature of attachment
- Relevant research
- Cultural relevance (Aboriginal, newcomers)
- Score actual interaction

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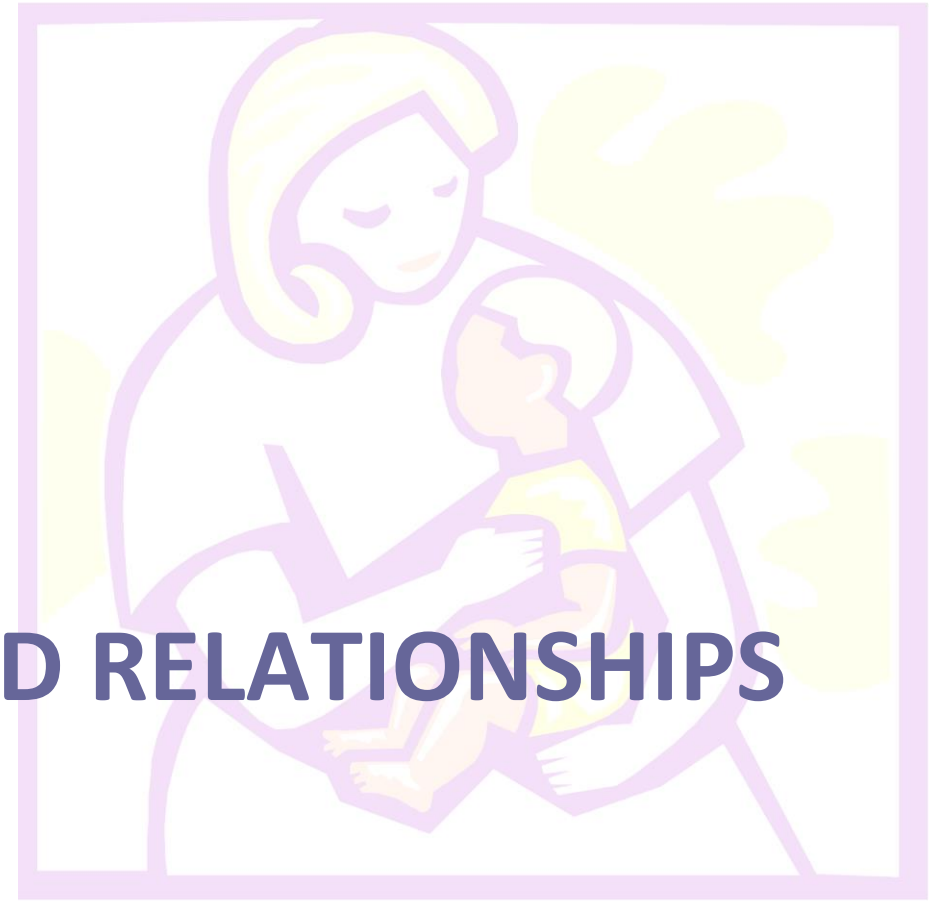

1. PARENT-CHILD RELATIONSHIPS

Determinants of Health

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- Socioeconomic environment
  - Income, income distribution, social status
  - Social support networks
  - Education
  - Employment and working conditions
  - Social environments (societal values & rules)
- Physical environment
- Healthy child development
- Personal health practices
- Individual capacity & coping skills
- Biology and genetics
- Health services
- Gender & culture

www.publichealth.gc.ca

Child Health Intervention and Longitudinal Development

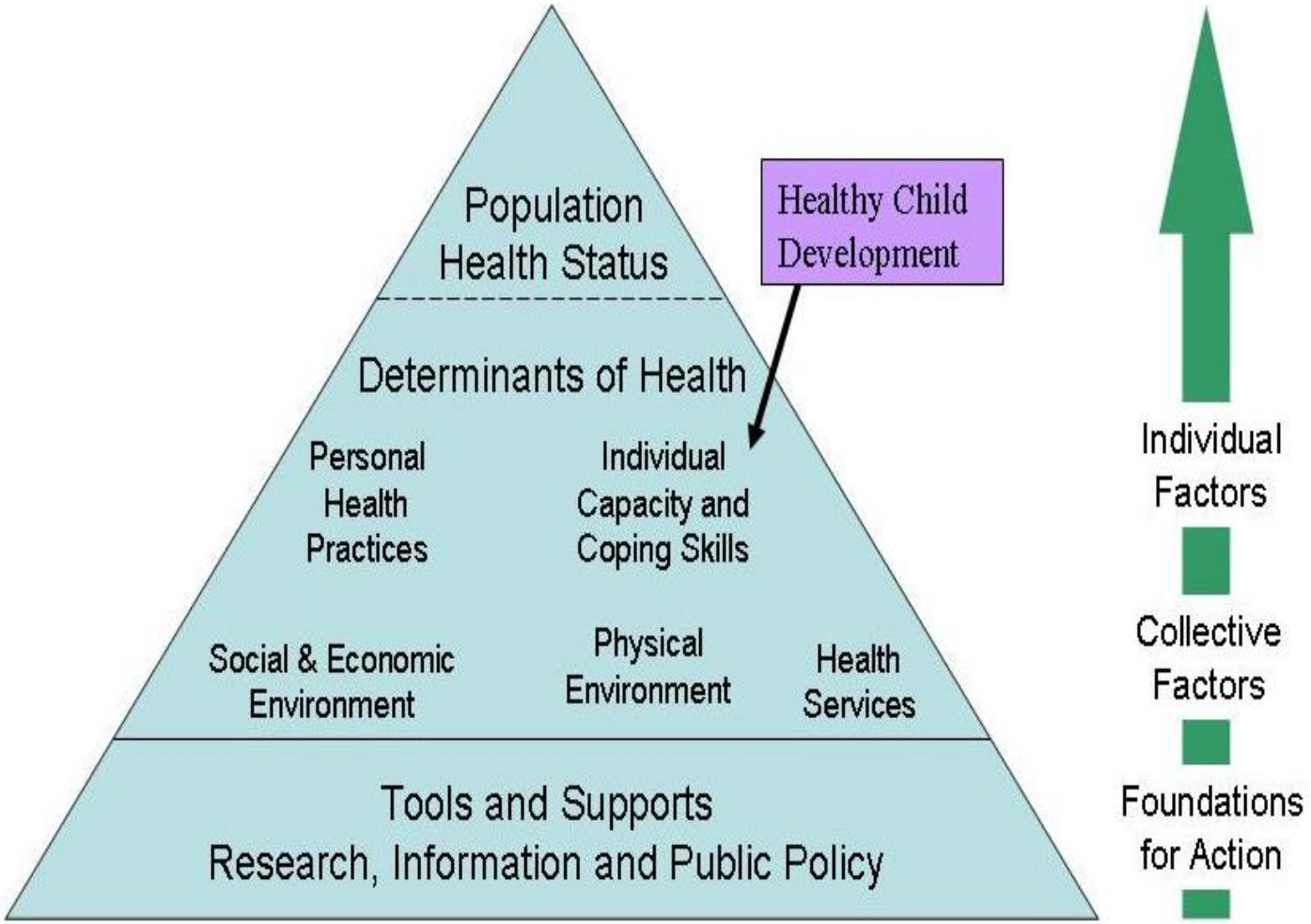
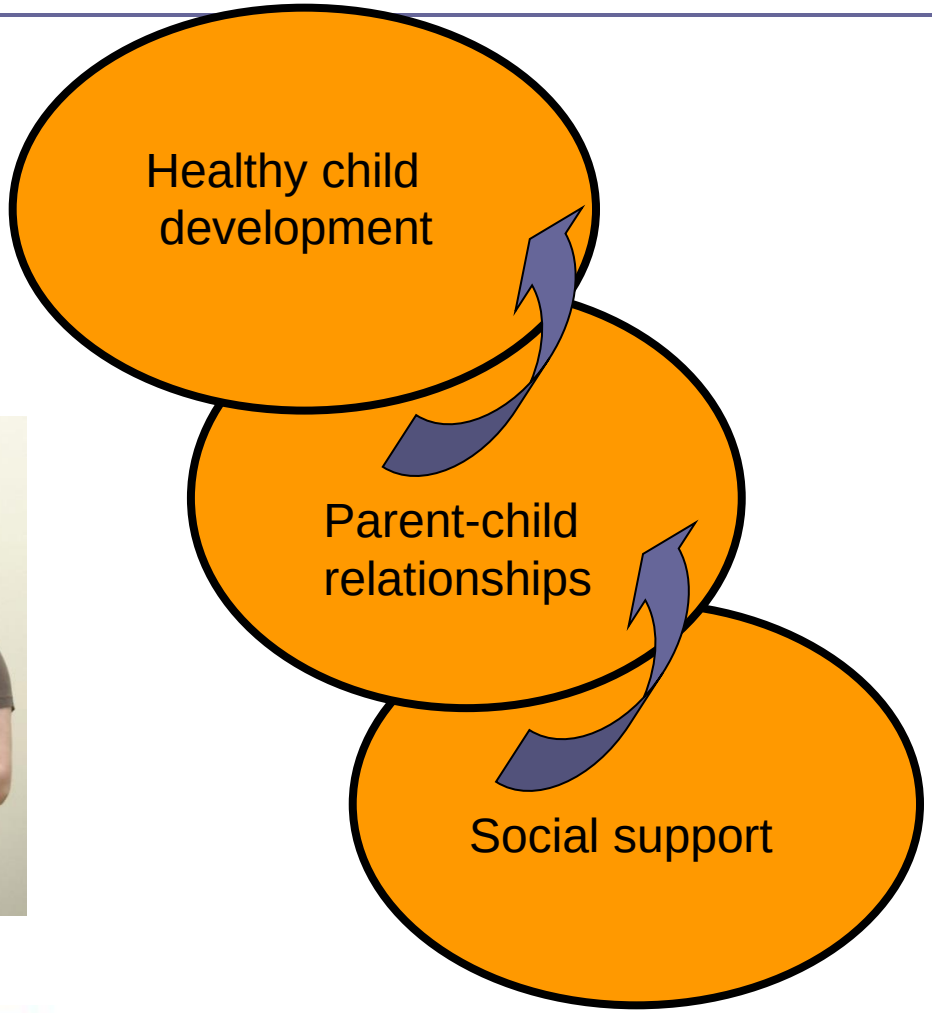


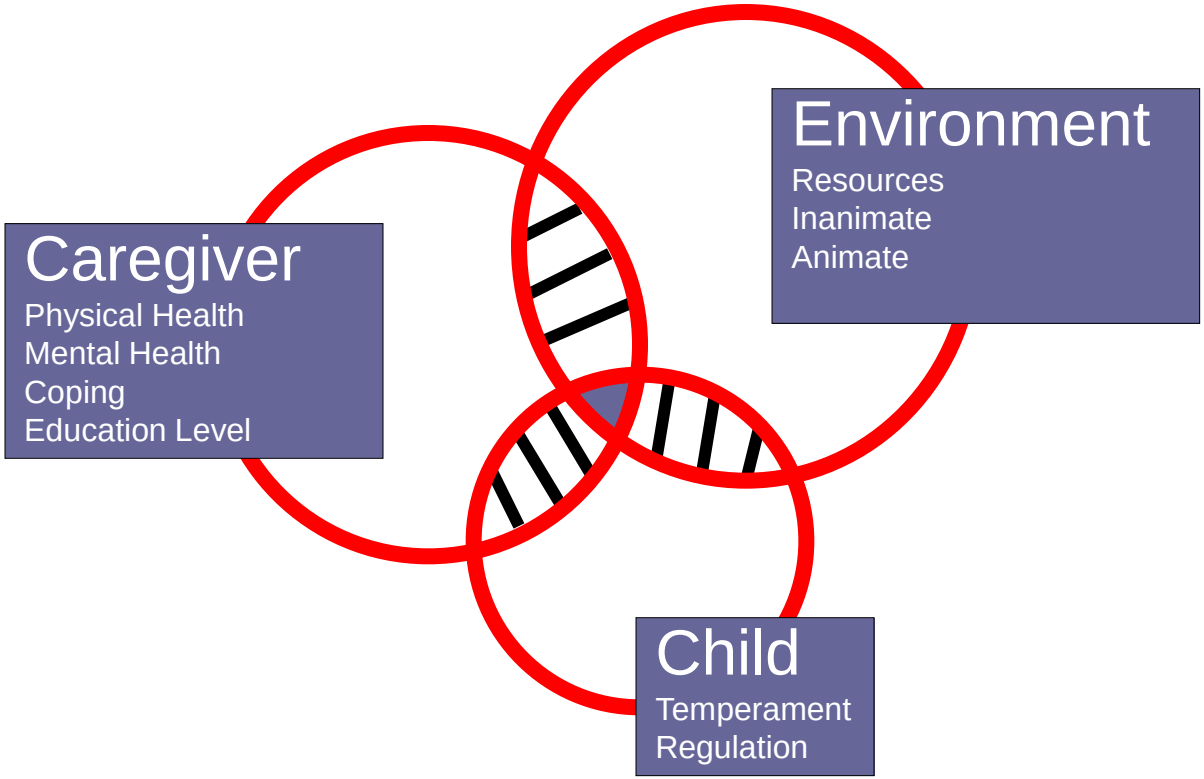
Figure 1. Population Health Framework (Minister of Supply and Services Canada 1994)

Determinants of Health

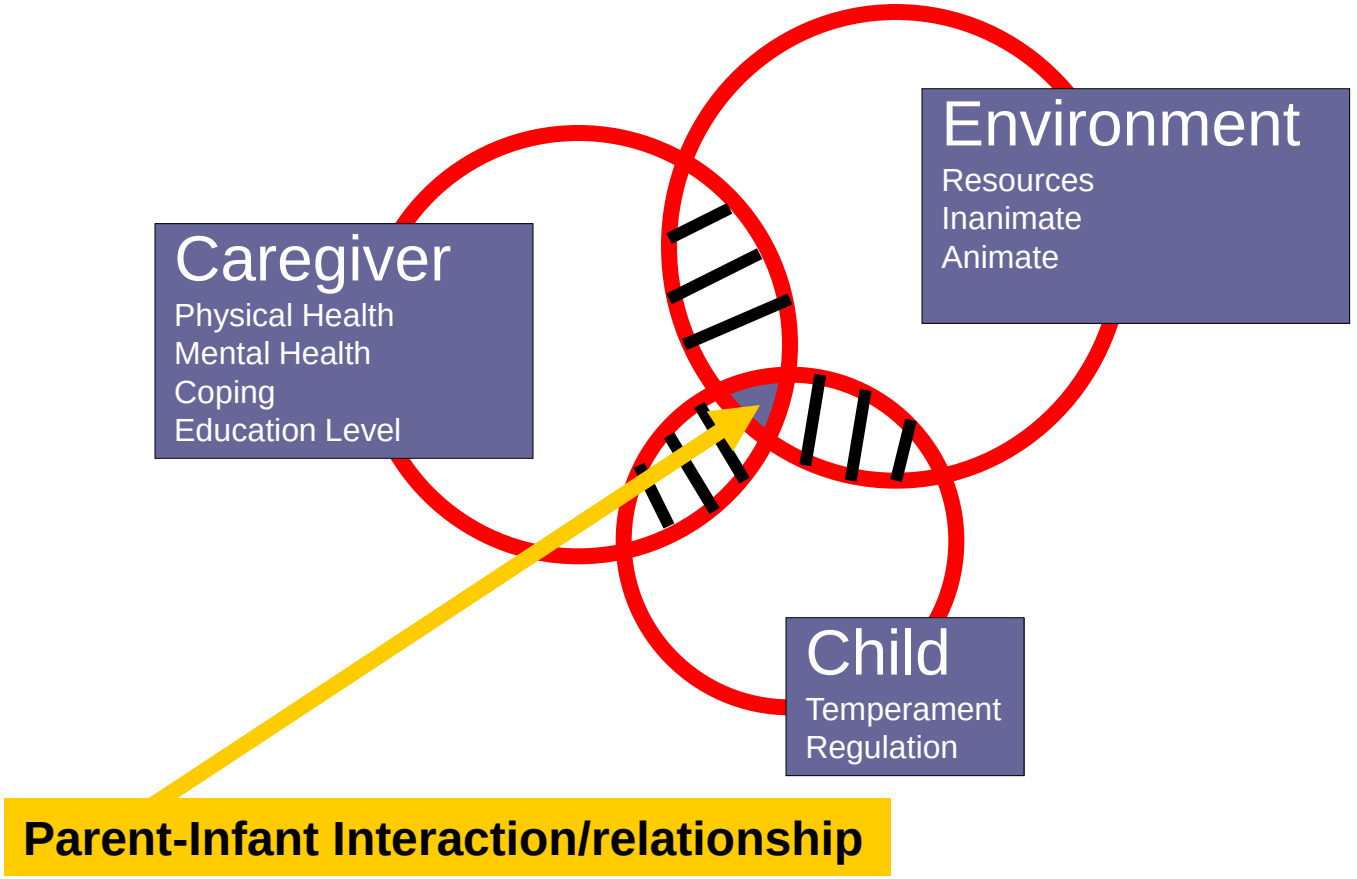
- Healthy child development
- Social support



Child Health Assessment Model (Barnard, 1976)



Child Health Assessment Model (Barnard, 1976)



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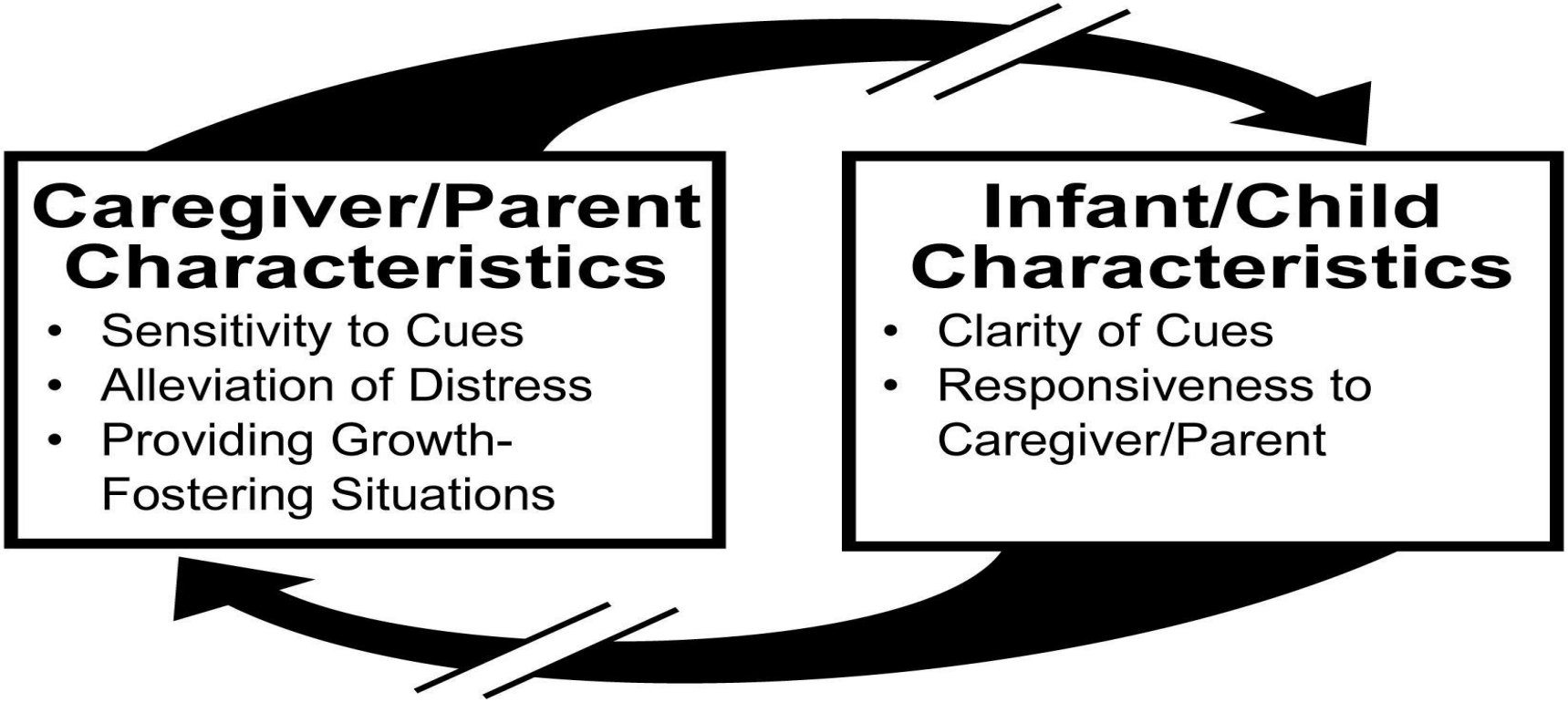
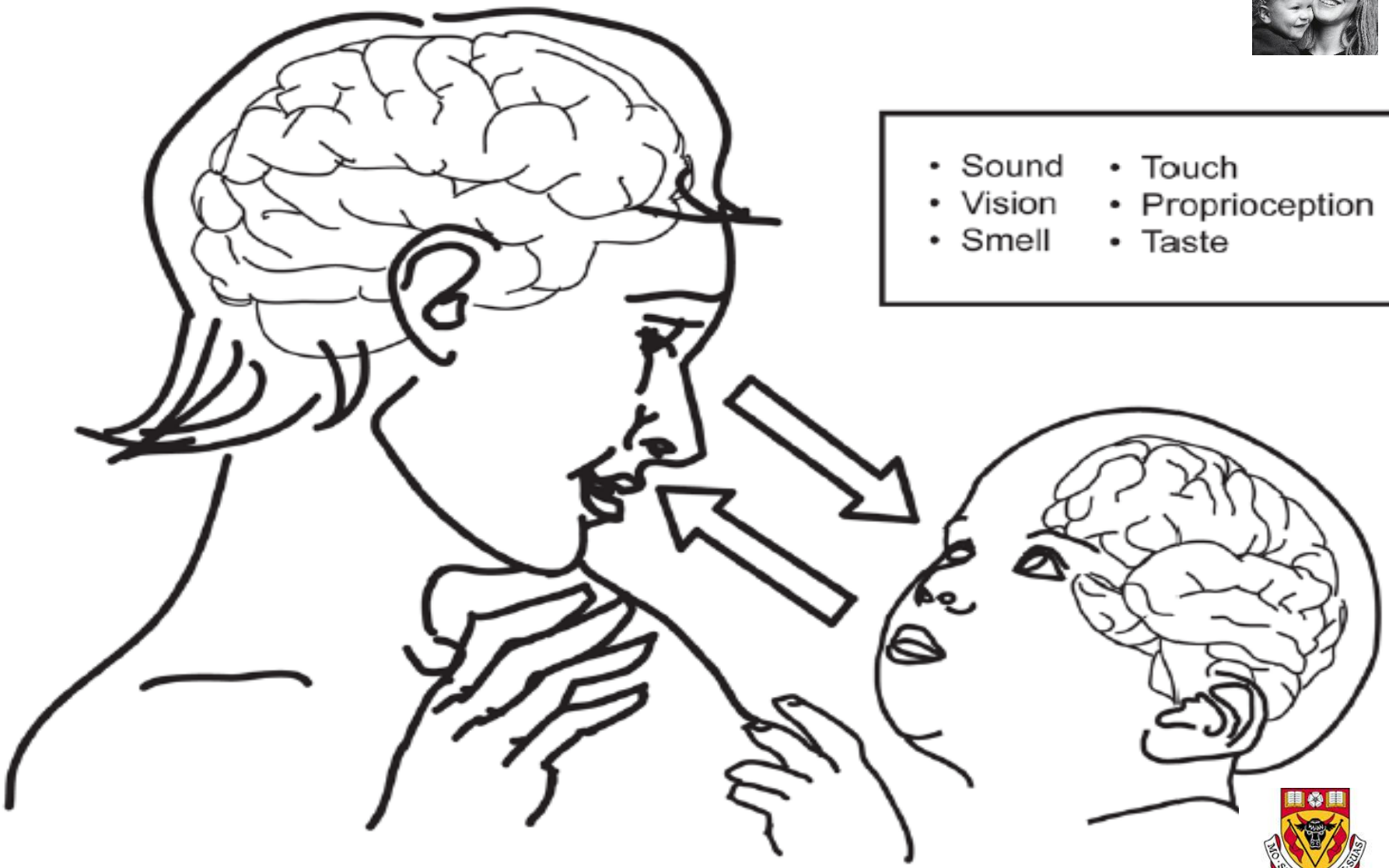
The Barnard Model



Adult-Child Interaction Figure 1.4



Interactions between adults and infants provide sensory stimulation that affects early brain development.

Adapted from Halfon, 2004

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Adult sensitivity is any pattern of behavior that pleases the infant and increases the infant's comfort and attentiveness and reduces its distress and/or disengagement *(Crittenden, 2011).*

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SERVE AND RETURN

Child Health Intervention and Longitudinal Development

States of Arousal

- Flooded (e.g. crying)
- Hyper-alert (e.g. fussy)
- Calmly focused & alert
- Hypo-alert
- Drowsy
- Asleep

Infant States

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- Different levels of sleeping and waking called “states” and are the basis for understanding infant behaviour.
- States combine to form the infant’s sleep/wake cycle.
- States are classified as sleep states, transitional state and awakes states.

Child Health Intervention and Longitudinal Development

Infant States

- Sleep States:
  - quiet sleep
  - active sleep
- Transitional State
  - drowsy

Infant States

- Awake States
  - quiet alert
  - active alert
  - crying

Infant States

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- Behaviours that characterize each state include:
  - body activity
  - eye movement
  - breathing patterns
  - level of response to stimuli

- Defining the infant state dramatically impacts on the mother-infant interaction/relationship.

Child Health Intervention and Longitudinal Development

Infant States

- Infant states can be influenced by stimulation from baby's environment:
  - Noise
  - Handling
  - Light
  - Temperature
  - Position
- Infant states can also be influenced by stimulation from within the baby:
  - Comfort
  - Hunger
  - Fatigue
  - Pain
  - Fear

Child Health Intervention and Longitudinal Development

Infant States

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- Infant's responsiveness in each state that will influence what will occur between mother and baby.
- For example, in the quiet alert state baby is awake and calm, just looking around, not fussy, whiny or unhappy, but will seem to be at peace.
- Quiet alert period will be when he is taking in the world around him and learning the most about his life.

Child Health Intervention and Longitudinal Development

Infant Cues

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- Cues that infant is ready to interact :
  - normal skin color
  - looks relaxed
  - arms and legs flexed or tucked
  - hand touching his face
  - hand to mouth or in mouth
  - sucking
  - looking at you
  - smiling
  - regular breathing rate
- Signs of stress—cues that infant needs a break:
  - hiccupping
  - yawning
  - looking away
  - squirming
  - frantic, disorganized activity
  - arms and legs pushing away
  - arms and legs limp and floppy
  - skin color changes

Child Health Intervention and Longitudinal Development

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Noticing and responding appropriatately to infant cues, mothers are regulators of their infants' states

Child Health Intervention and Longitudinal Development

Mothers are “hidden” regulators of their infants’ endocrine & nervous systems

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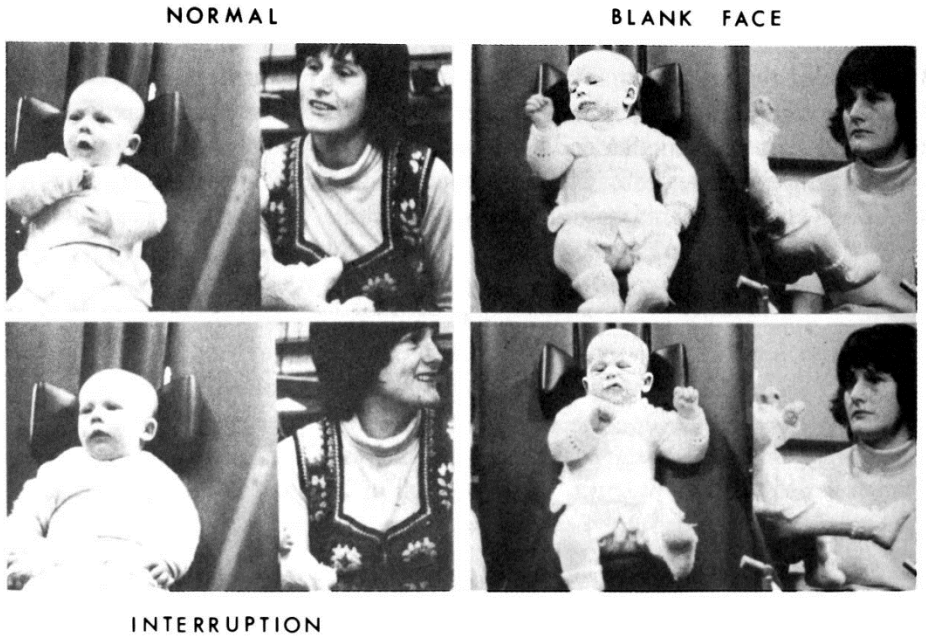

Figure 1. Stills from cine films of Experiment 1 showing typical infant reactions in the three conditions.

STILL FACE PROCEDURE HTTPS://WWW.YOUTUBE.COM/WATCH?V=APZXGEBZHT0

Child Health Intervention and Longitudinal Development

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2. ATTACHMENT

Not what I mean by Attachment

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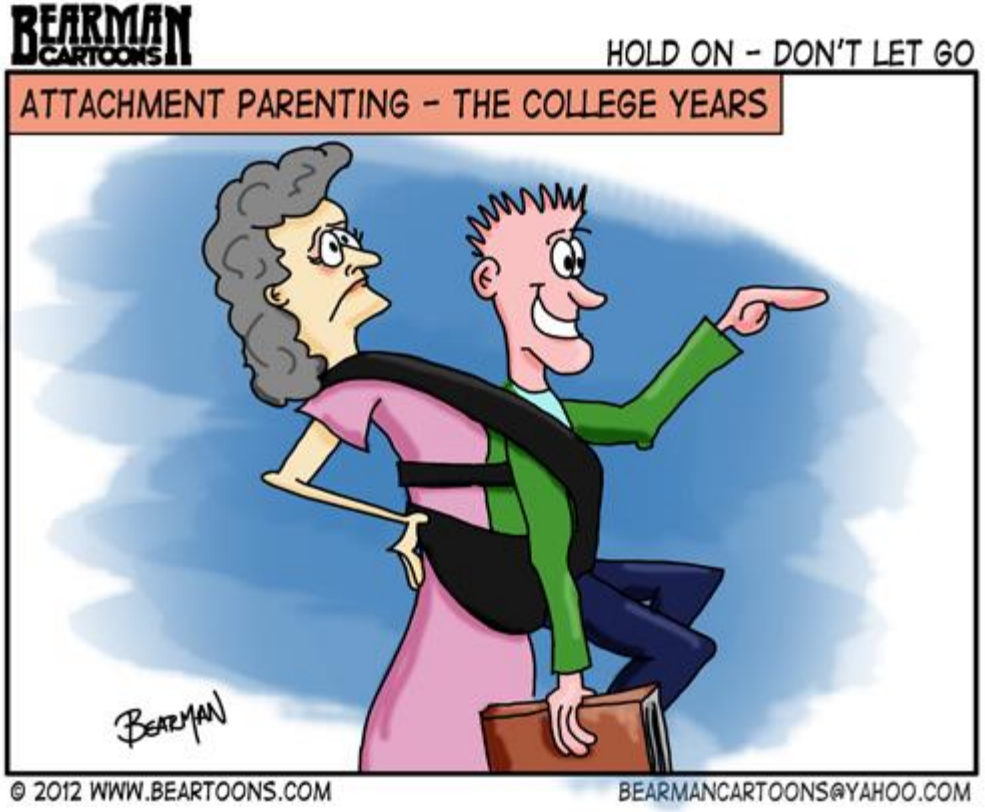

Child Health Intervention and Longitudinal Development

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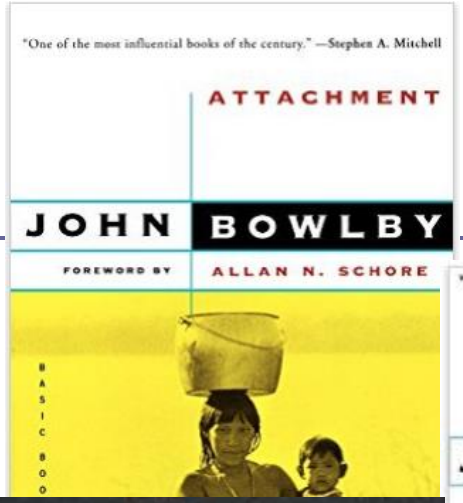
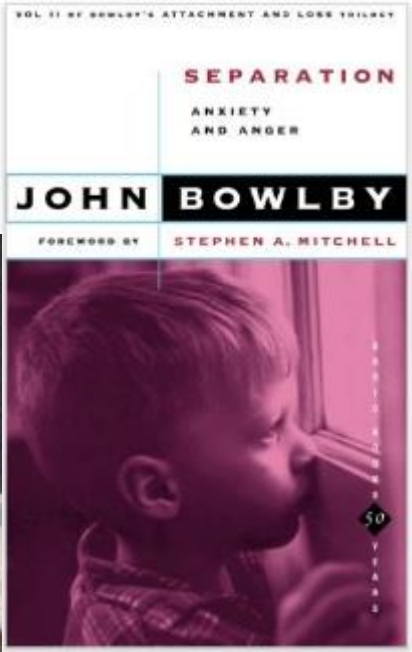
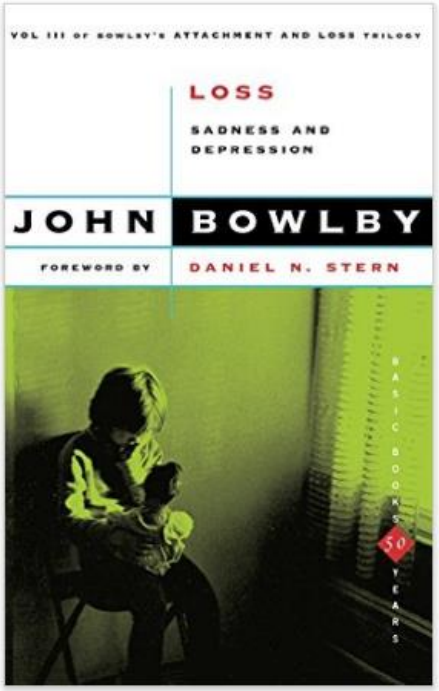
There is no such thing as a baby—

Winnicott

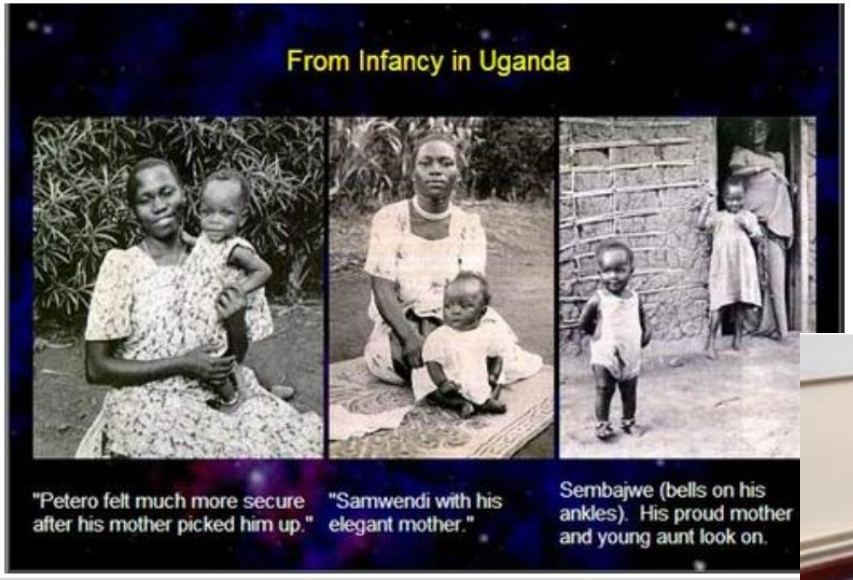
Child Health Intervention and Longitudinal Development


"One of the most influential books of the century." —Stephen A. Mitchell
ATTACHMENT
JOHN BOWLBY
FOREWORD BY ALLAN N. SCHORE


SEPARATION
ANXIETY AND ANGER
JOHN BOWLBY
FOREWORD BY STEPHEN A. MITCHELL


LOSS
SADNESS AND DEPRESSION
JOHN BOWLBY
FOREWORD BY DANIEL N. STERN

John Bowlby (1907-1990) & Mary Salter Ainsworth (1913-1999)



Child Health Intervention and Longitudinal Development

What is Attachment? (Bowlby)

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- Attachment is an emotional bond to another person…"a lasting, psychological connectedness between human beings"
- Bowlby believed that the earliest bonds formed by children with their caregivers have a tremendous impact that continues throughout life
- Attachment serves to keep the infant close to the mother, thus improving child's chances of survival

Child Health Intervention and Longitudinal Development

Attachment Theory

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- Integrative perspective, a systemic theory that focuses on behaviour in context and patterns of communication
- Takes an evolutionary perspective designed to maintain proximity and care between primary caregivers and children
- Bowlby proposed that inside every individual there are scripts or internal working models that are built from our experiences of being cared for as infant
- So an infant that receives consistent, caring attention will build an internal working model that will also them to develop a secure base

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Proximity Maintenance

Safe Haven

Attachment

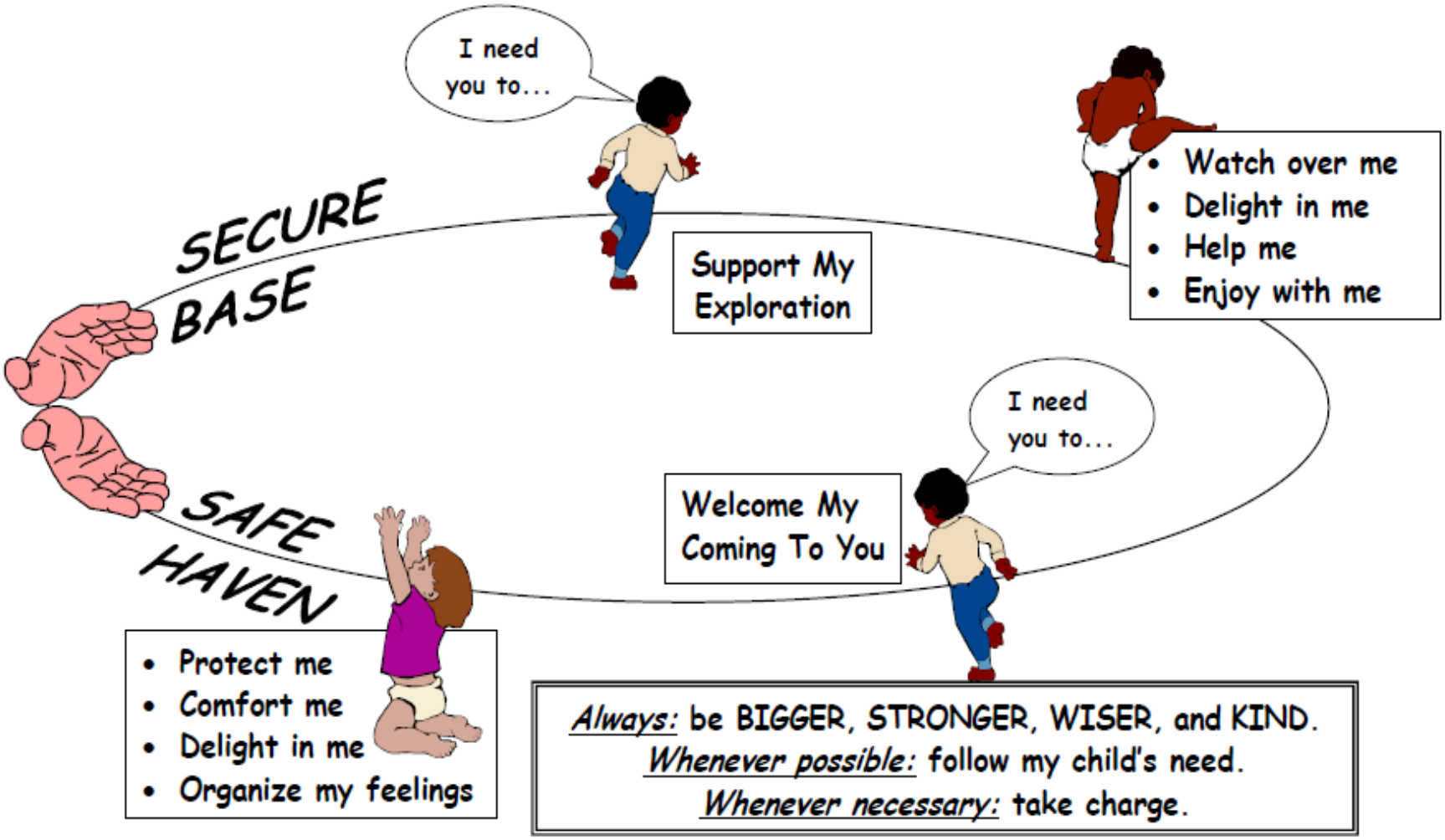
Secure Base

Separation Distress

Child Health Intervention and Longitudinal Development

CIRCLE OF SECURITY

PARENT ATTENDING TO THE CHILD'S NEEDS



Measuring Attachment

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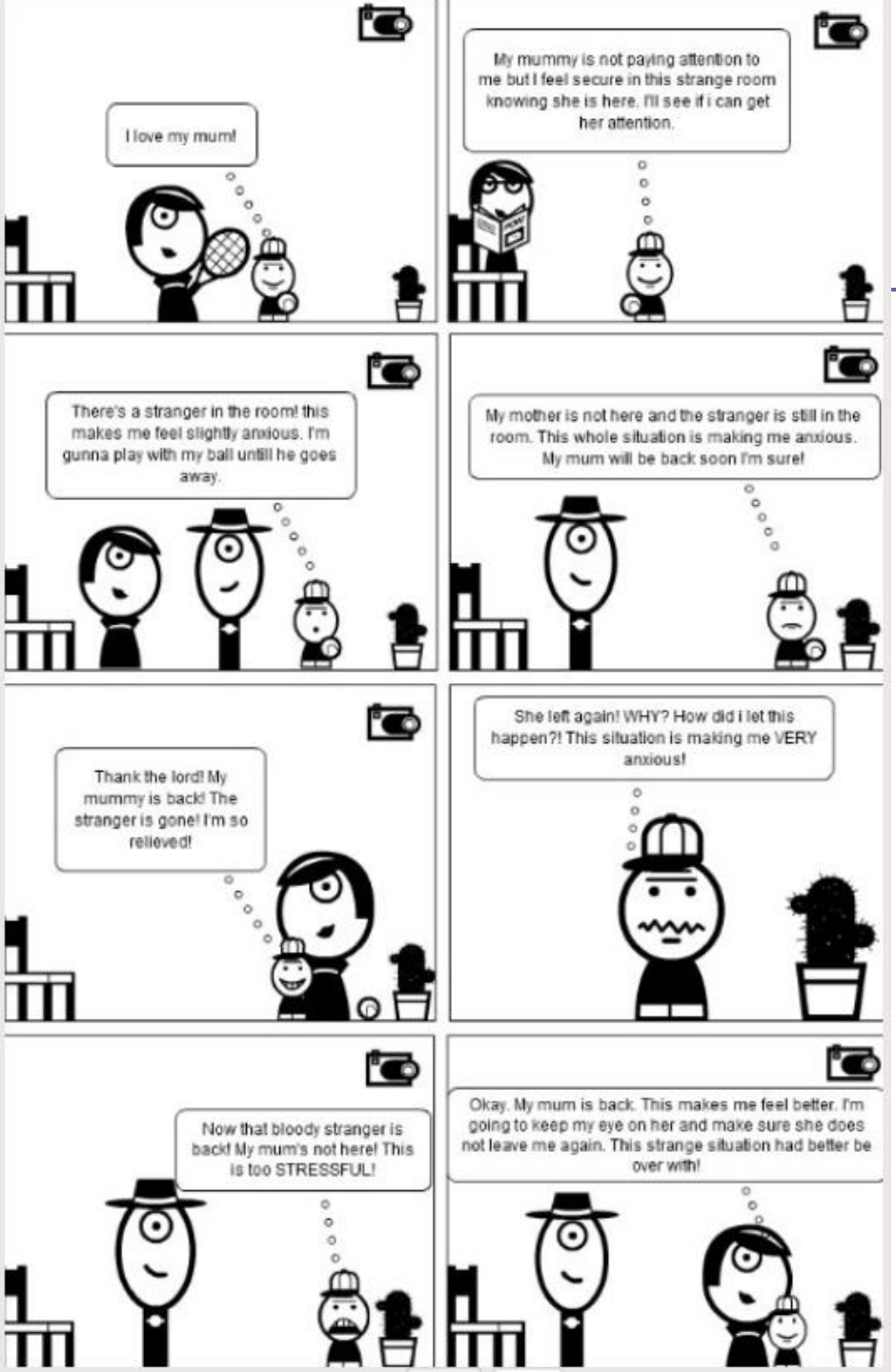
- The pattern of a specific relationship
- A self-protective strategy (Crittenden)
- 4 patterns—Types A, B, C & D (A/C)
- Type B infants are securely attached

> Pattern reflects whether children feel secure in the availability and responsiveness of caregivers

Bowlby, 1988; Ainsworth, 1978; Crittenden, 2005



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Child Hea
Longitudi

Secure Attachment (Type B)

- Use caregiver as **secure base** from which to explore
- Display clear preference for comfort received from caregiver
- Greet caregiver with smile or vocalization and will initiate contact
- **Safe haven** from distress or fear

Cassidy & Shaver; Van Izjendornn, 1992

Secure Attachment (Type B)

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- resiliency and curiosity in preschool children (Arend, Grove, & Sroufe, 1978)
- self-reliance, self-regulation and social competence in adulthood (Sroufe, 2005)
- more optimal relationships with peers throughout childhood and adolescence (Schneider, Atkinson, & Tardif, 2001)

Child Health Intervention and Longitudinal Development

Insecure Attachment

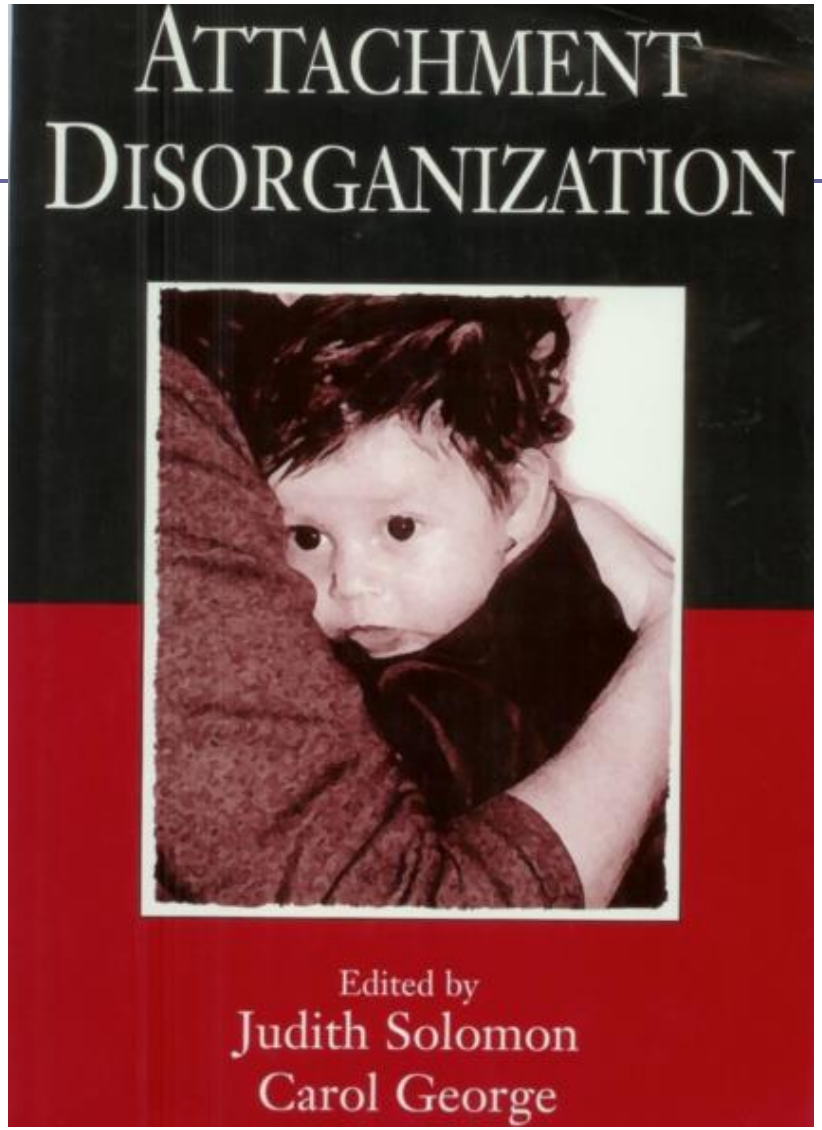
Avoidant (Type A):

- Show signs of ignoring, looking or turning away from caregiver
- make no effort to maintain contact with caregiver

Ambivalent (Type C):

- Seek contact with caregiver then resist contact angrily once achieved

Cassidy & Shaver, Handbook of Attachment


ATTACHMENT
DISORGANIZATION
Edited by
Judith Solomon
Carol George

Insecure and Disorganized Attachment (Types A, C, D)

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- Problems with intimacy and affection, trust issues
- Low self-esteem
- Difficulty maintaining relationships
- Behavioural (e.g. conduct disorder)
- Academic/cognitive problems
- Mental health problems (e.g. anxiety, depression)

(Fearon, Bakermans-Kranenberg, van Ijzendoorn, Lapsley, & Roisman, 2010; Lyons-Ruth, Alpern, & Repacholi, 1993; Colonnesi et al., 2011; Groh, Roisman, van Ijzendoorn, Bakermans-Kranenberg, & Fearon, 2012).

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AINSWORTH SSP HTTPS://WWW.YOUTUBE.COM/WATCH?V=DH1M_ZMO7GU

Child Health Intervention and Longitudinal Development

Why these strategies?

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- Type A minimize awareness of feelings and do what will be reinforced and to avoid doing what will be punished—disorders of inhibition and compulsion.

  E.g a child responded to negatively each time she cries may develop a Type A strategy.

- Type C focus on feelings as guides to behaviour—disorders of anxiety and obsessiveness tied to too great a reliance on negative affect.

  E.g. a child who is ignored by a passive parent unless acts out may develop Type C strategy

Child Health Intervention and Longitudinal Development

Normative distributions

- Type A (Insecure-Avoidant; 10-20%)
- Type B (Secure; 65%)
- Type C (Insecure-Ambivalent; 10-15%)
- Type D (Disorganized-drawn from A&C; 0-15%)

(Ainsworth; Crittenden; Main)

Symptoms or Strategies?

- Attentional problems
- Hypervigilance
- Compulsions
- Agitation
- Aggressiveness (Crittenden, A&P)
- Provocativeness
- Acting the victim

Attachment & Development

Over the lifespan, insecure attachment is associated with:

- Problems with intimacy and affection
- Trust issues
- Low self-esteem
- Difficulty maintaining relationships
- Behavioural, academic and mental health problems

DMM Patterns of Attachment in Infancy

Integrated

Cognition

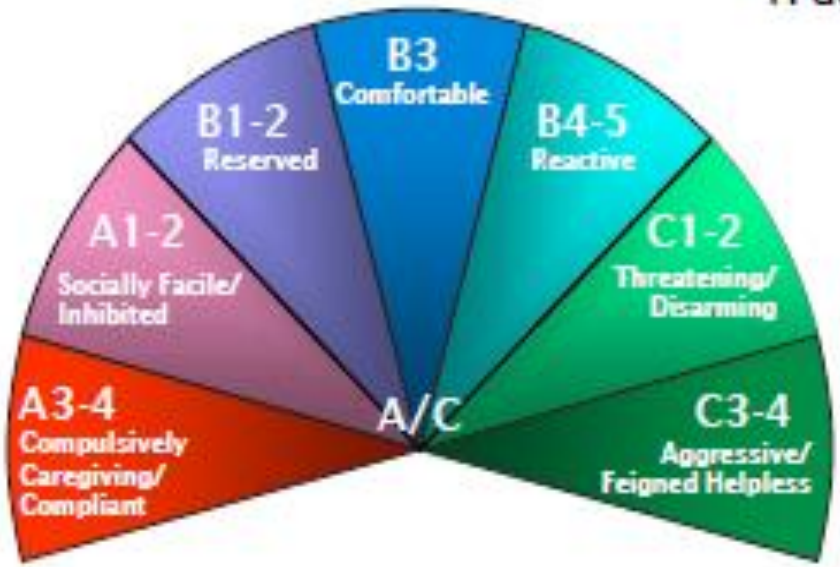
Affect

DMM Patterns of Attachment in the Preschool Years

Integrated

True Cognition

True Negative Affect



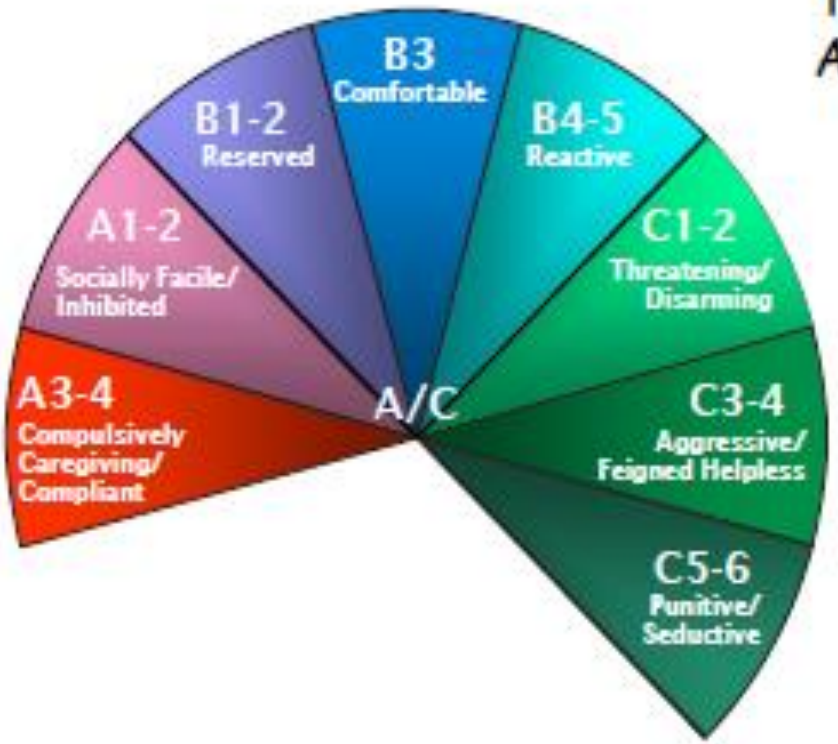
False Positive Affect

DMM Patterns of Attachment in the School Years

Integrated True Information

True Cognition

True Negative Affect



False Positive Affect

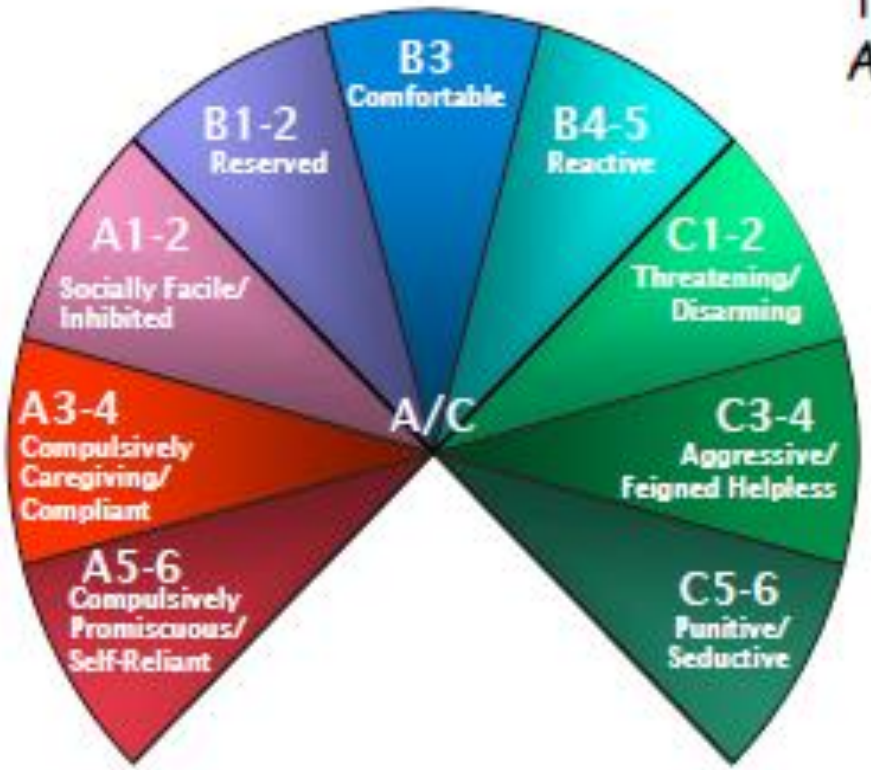
False Cognition

DMM Patterns of Attachment in Adolescence

Integrated True Information

True Cognition

True Negative Affect



False Positive Affect

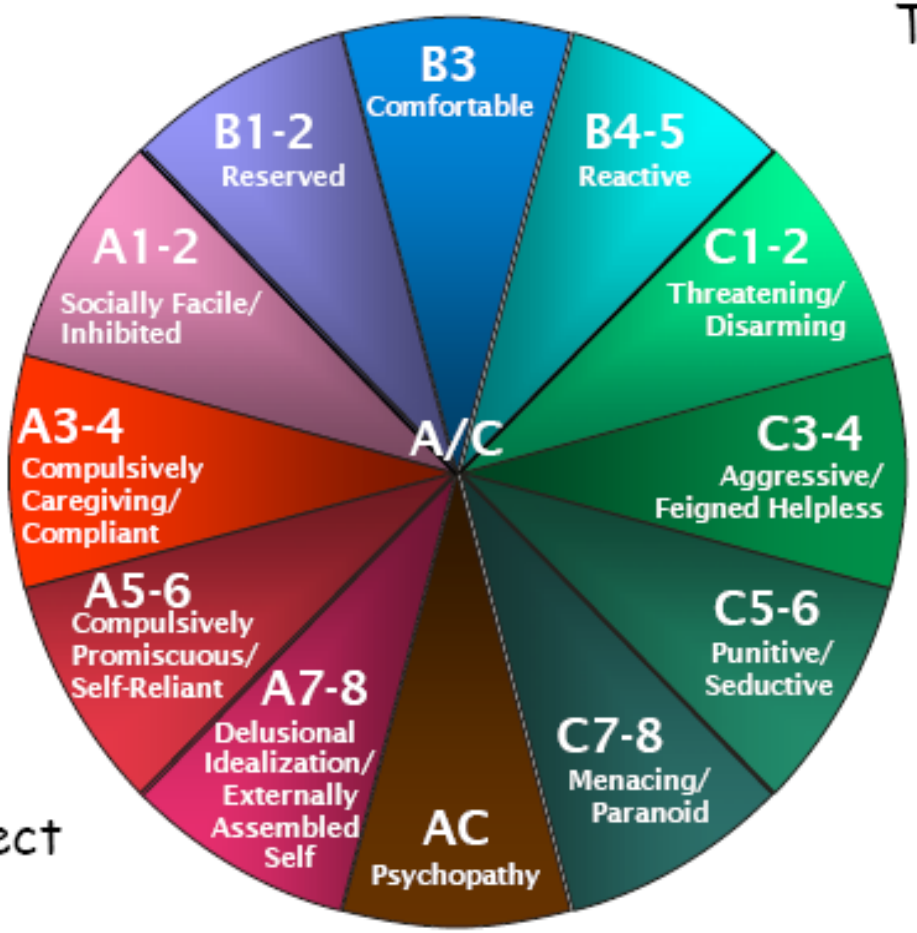
False Cognition

DMM Patterns of Attachment in Adulthood

Integrated True Information

True Cognition

True Negative Affect



False Positive Affect

False Cognition

Integrated False Information

Health Psychology
2013, Vol. 32, No. 4, 409–417

0278-6133/13/$12.00 DOI: 10.1037/a0028889

Predicting Adult Physical Illness From Infant Attachment: A Prospective Longitudinal Study

Jennifer Puig, Michelle M. Englund, Jeffry A. Simpson, and W. Andrew Collins
University of Minnesota

Objective: Recent epidemiological and longitudinal studies indicate that attachment relationships may be a significant predictor of physical health in adulthood. This study is among the few to *prospectively* link attachment classifications assessed in infancy to physical health outcomes 30 years later in adulthood, controlling for various health-related confounds. ***Methods:*** Participants were 163 individuals involved in a 32-year longitudinal study of risk and adaptation who have been followed since birth. Attachment classifications were assessed at ages 12 and 18 months using the Ainsworth Strange Situation Procedure. Stability of attachment security was derived from these assessments. At age 32, participants completed a questionnaire asking about the presence of or treatment for current physical illnesses. ***Results:*** Binary logistic regression analyses controlling for health-related confounds at age 32 indicated that individuals who were insecurely attached (i.e., anxious-resistant or anxious-avoidant) during infancy were more likely to report an inflammation-based illness in adulthood than those classified as securely attached during infancy. There also was a trend whereby individuals classified as anxious-resistant reported more nonspecific symptoms in adulthood than those classified as either anxious-avoidant or secure. Individuals who were continuously insecure during infancy were more likely to report all types of physical illness in adulthood. ***Conclusion:*** These findings reveal the lasting effect of early interpersonal relationships on physical health and suggests that infancy may be a fruitful point for prevention efforts. The widespread influence that attachment has on endogenous and exogenous health-related processes may make it particularly potent in the prevention of later physical health problems.

Keywords: infant attachment, physical illness, developmental antecedents, longitudinal study

Clinical and developmental psychologists have long assumed that early life experiences hold a privileged place in influencing later life outcomes (Sameroff, 2010; Sroufe, 1997). Although this framework is often associated with developmental precursors to psychopathology, it has been extended to the etiology of chronic diseases (e.g., Felitti et al., 1998; Shonkoff, Boyce, & McEwen, 2009). Researchers in medicine and psychology have suggested that developmental principles should be applied to the study of physical illnesses (e.g., Barker, Gluckman, Godfry, Harding, Owens, & Robinson, 1993; Boyce, 1985), but a lack of longitudinal data has prevented this framework from being tested (for an exception, see Friedman & Martin, 2011; Moffitt et al., 2010). The current longitudinal study was guided by a developmental approach (see Sroufe, Egeland, Carlson, & Collins, 2005) and ex-

The links between interpersonal functioning and health outcomes have long been established. Several large-scale epidemiological studies have revealed that not having social relationships is a significant risk factor for poor health, similar in magnitude to smoking, obesity, and chronic physical inactivity (House, Landis, & Umberson, 1988). Other findings (e.g., Christakis & Fowler, 2007) indicate that obesity spreads through social networks across geographical and interpersonal distance up to three 'degrees of separation' from target participants. Furthermore, the quality of close relationships, especially marital relationships, affects immune functioning, neuroendocrine functioning, and reactivity to stressful events, rendering individuals vulnerable to various diseases (Coan, Schaefer, & Davidson, 2006; Kiecolt-Glaser, Glaser, Cacioppo, & Malarkay, 1998). These and other studies indicate the

SSP at 12-18 months:
More likely to report inflammation-based illnesses and all types of physical Illnesses at 32 years!

What is an Attachment Figure?

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- Protection and comfort
- Secure base and safe haven
- Person who is there when you need…
- Long-term intimate, reciprocal relationship
- Affectively charged
- Person-specific
- Basis for physical and psychological survival

From Crittenden A&P, 2008

- Target of NCAST Intervention

Insecure Attachment

Primary caregiver :

- Insensitive
- Disengaged
- Uninvolved
- Emotionally flat
- Controlling

Infants develop:

- Self-protective strategies

Danger is the Problem

- Insecure attachment is not the problem…danger is the problem (Crittenden)
- Insecure attachment is the solution

Anxious/insecure attachment is the child's strategy for eliciting protection and comfort from the parent.

Secure Attachment

Cassidy & Shaver (1999), Handbook of Attachment

Sensitivity and parental availability are key determinants of secure attachment

What interferes with maternal (parental) sensitivity?

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Attachment & trauma history

Mental health problems

Family violence

Maternal addictions

=

Current or Past stress

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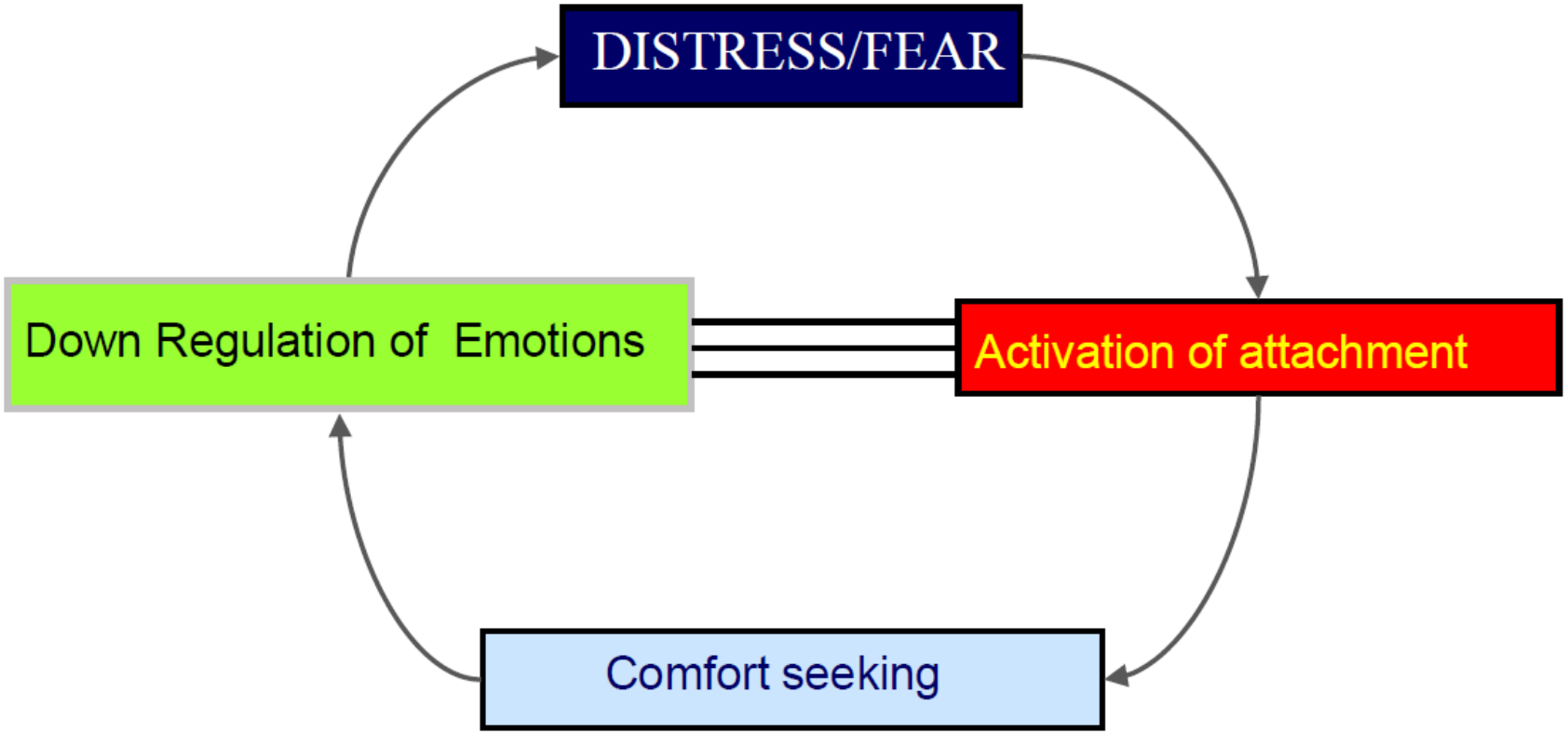
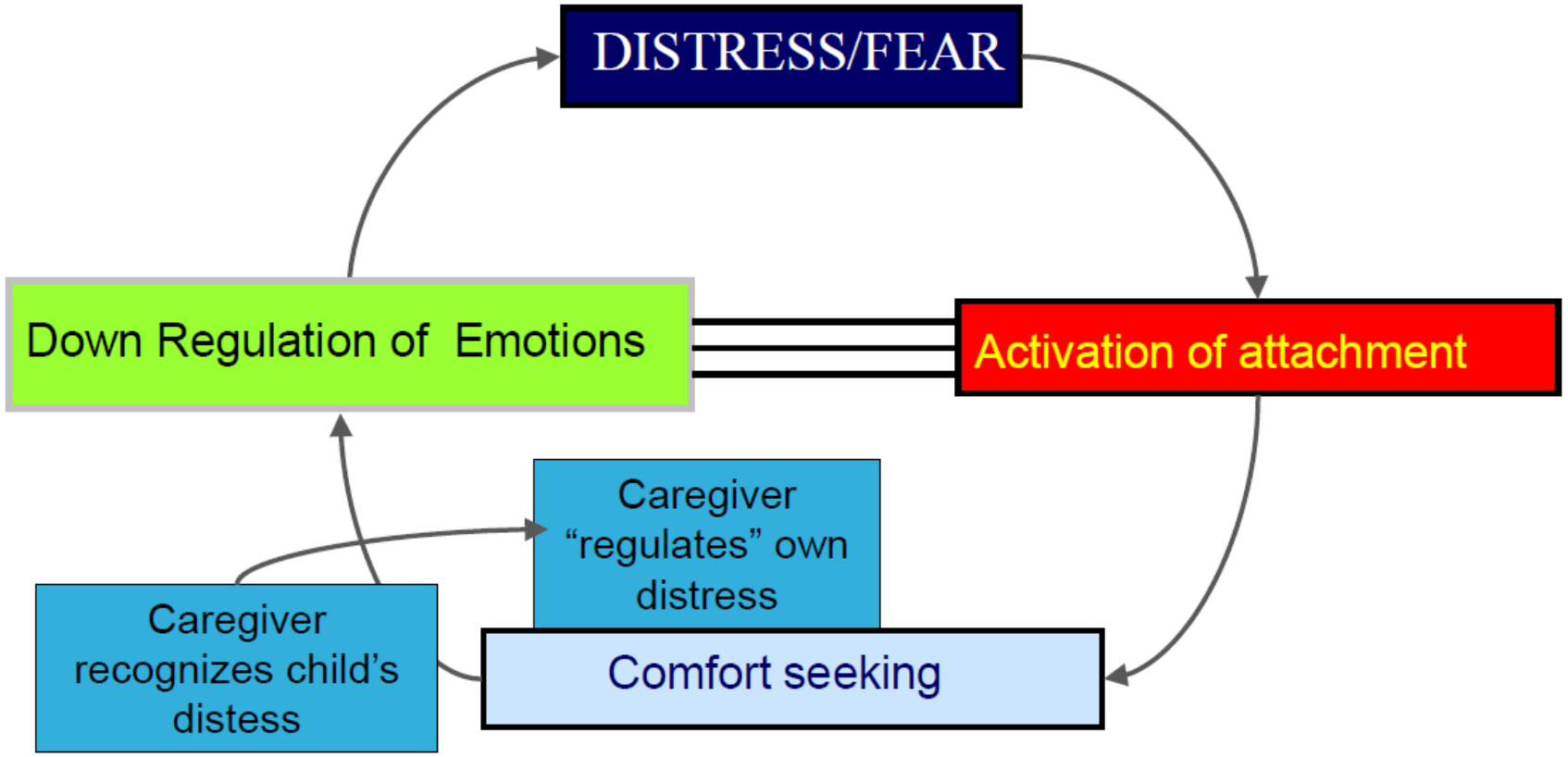
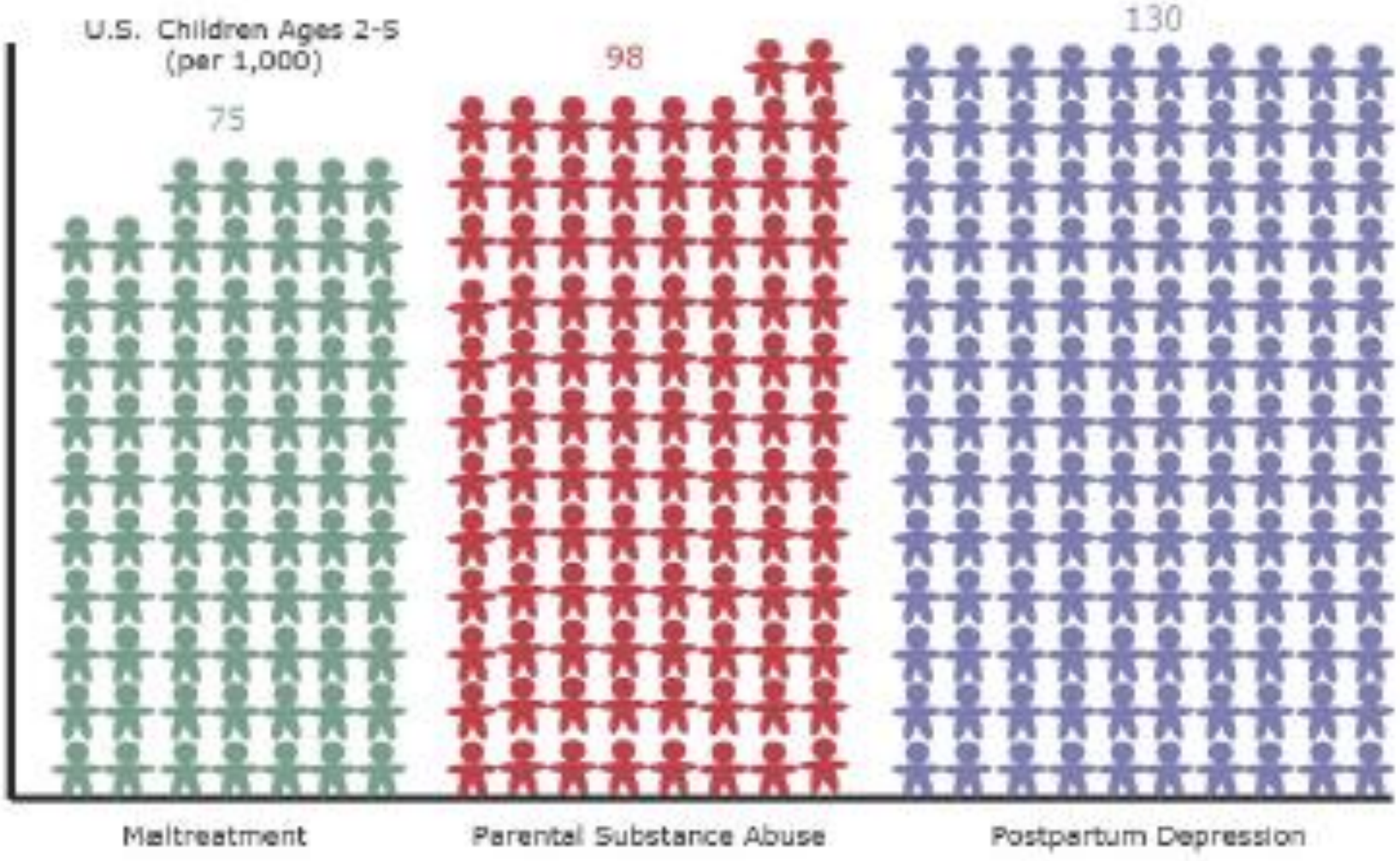


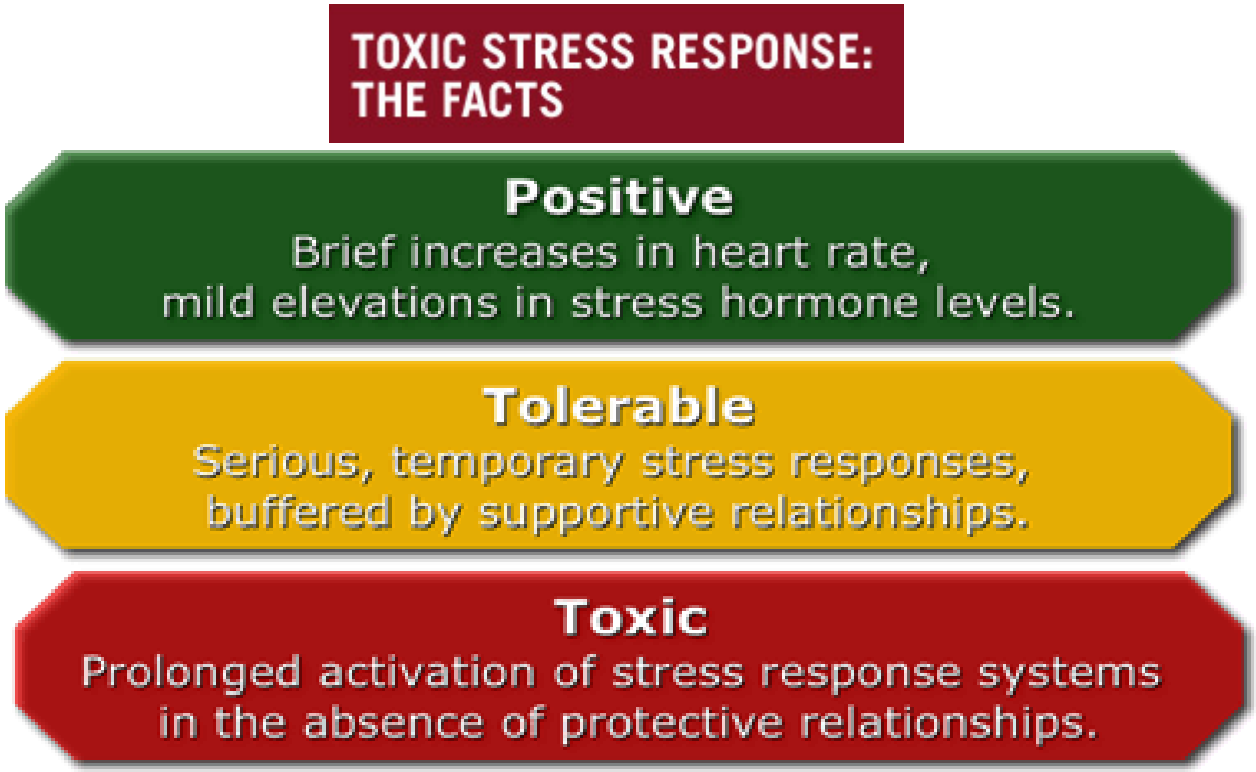
*Luyten, P., Mayes, L.C., Fonagy, P., & Van Houdenhove, B. (In Press). The interpersonal regulation of stress.



*Luyten, P., Mayes, L.C., Fonagy, P., & Van Houdenhove, B. (In Press). The interpersonal regulation of stress.

Sources of Toxic Stress in Young Children




TOXIC STRESS RESPONSE:
THE FACTS
Positive
Brief increases in heart rate,
mild elevations in stress hormone levels.
Tolerable
Serious, temporary stress responses,
buffered by supportive relationships.
Toxic
Prolonged activation of stress response systems
in the absence of protective relationships.

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3. RELEVANT RESEARCH

Mothers and fathers are "hidden" regulators of their infants' endocrine & nervous systems

Maternal-Child Interaction & Self-Regulation

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Critical aspect of regulating a baby's states involves modulating the intensity of stimulus (stress) to engage and sustain the baby's attention i.e not trigger the impulse to cry, avert gaze, or shut down.

Violence and Victims, Volume 28, Number 4, 2013

Mothers and Infants Exposed to Intimate Partner Violence Compensate

Nicole Letourneau, RN, BN, MN, PhD
University of Calgary

Catherine Young Morris, MA, BA
Loretta Secco, RN, BScN, MN, PhD
University of New Brunswick

Miriam Stewart, BScN, MN, PhD
University of Alberta

Jean Hughes, BN, MSc, PhD
Dalhousie University

Kim Critchley, BScN, MN, PhD
University of Prince Edward Island

Reasons for the developmental variability in children exposed to intimate partner violence (IPV) are unclear and under studied. This article presents exploratory findings on (a) the potential impact of IPV on mother–child relationships and child development and (b) the association between these maternal–child relationship impacts and child development. The fit of findings with compensatory, spillover, and compartmentalization hypotheses was explored. Participants were 49 mothers and 51 children younger than 3 years of age affected by IPV. Data were collected on maternal–child interactions, child development, social support, difficult life circumstances, family functioning, child temperament, and parental depression. The findings suggested developmental impacts on children in the sample, along with children's high sensitivity and responsiveness to their caregivers. Although some spillover effects were observed, the predominant observation was of mothers and infants compensating for exposure to IPV in their interactions.

Keywords: maternal care patterns; violence; partner abuse; multimethods

Estimates of women's lifetime exposure to intimate partner violence (IPV) by husbands, partners, or boyfriends range between 8% and 66% dependent on the study sample (e.g., shelter vs. nonshelter population) and definition of abuse (Browne, 1993; Johnson & Sacco, 1995; Jones et al., 1999; Morse, 1995; Sugarman & Hotaling, 1989). Fifty-six percent of women who report wife assault are between the ages of 18 and

http://dx.doi.org/10.1891/0886-6708.VV-D-12-00077

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Child Health In
Longitudinal De

PCI & Child Development

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Parental Stress (Family Violence)

Reduced parental sensitivity & responsiveness

Altered child development

Child Health Intervention and Longitudinal Development

Family Violence

- Exposure to family violence is linked with severe psychological and behavioural effects on children in later life

- The effects of violence on children may be directly related to their lack of an emotionally safe and secure environment

Variation in Children's Outcomes

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Multiple studies of children exposed to domestic violence have confirmed that children's responses range from serious maladjustment to no adjustment problems

(Whiteside et al., 2009)

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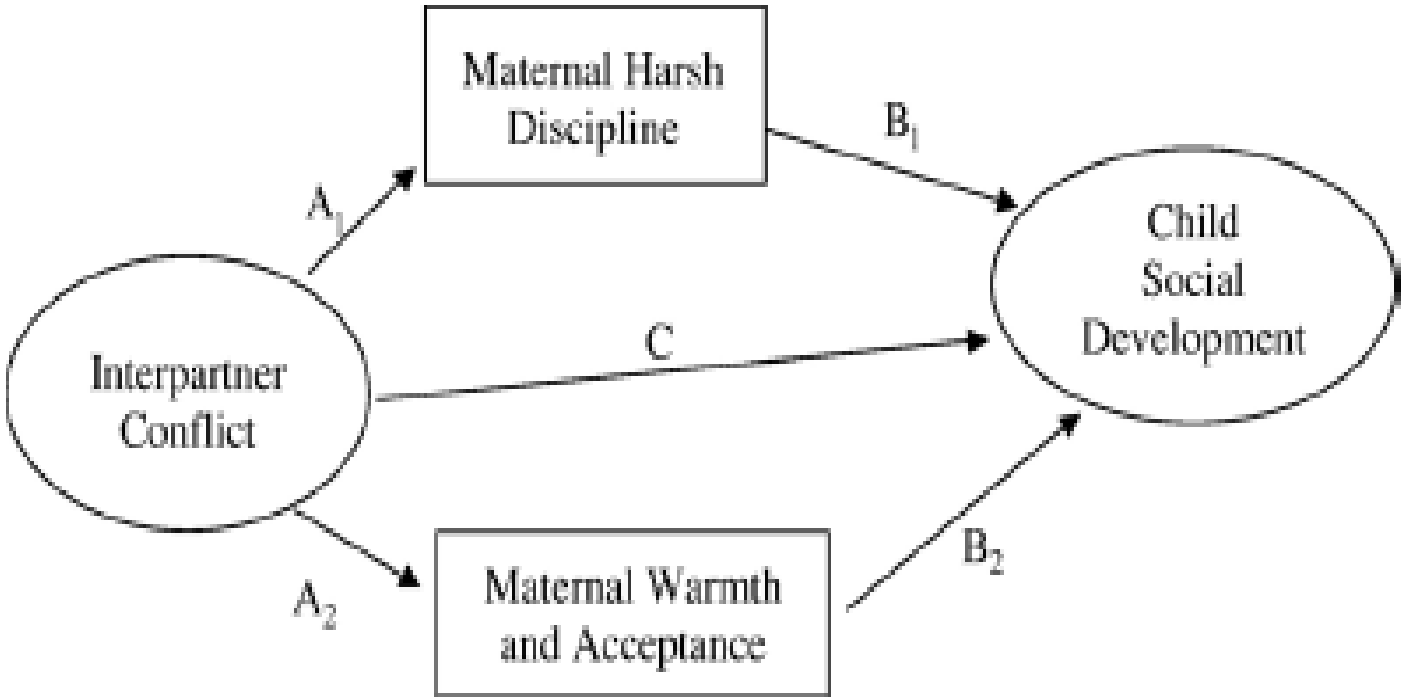
Whiteside-Mansell et al. 2009



Three Hypotheses

- Compartmentalization
  - Family violence affects child development directly.
- Spillover
  - Parents with conflictual relationships are more emotionally drained and stressed, preventing them from being sensitive to their children and increasing the likelihood of child maladjustment.
- Compensatory
  - Parents may compensate for dissatisfaction in adult relationships by enhancing parent-child relationship.

NCATS (n=44)

- For all subscales, the mean scores were above 10th percentile scores (above the cut-off indicating worrisome scores)
- Nearly all subscale scores were significantly better than the normative NCAST database means (for low education adults or high education adults)
- However, scores were significantly lower for responsiveness to infant distress and social-emotional growth fostering opportunities.

Child Development: ASQ

- For all subscales, mean scores above the 10th percentile cut-offs, but lower than the normative means.
- Fine motor and problem-solving were statistically significantly lower than ASQ norms.
- NCAST maternal cognitive growth fostering correlated with infant communication (r=.47) and infant personal social skills (r=.35).

Compartmentalization Hypothesis

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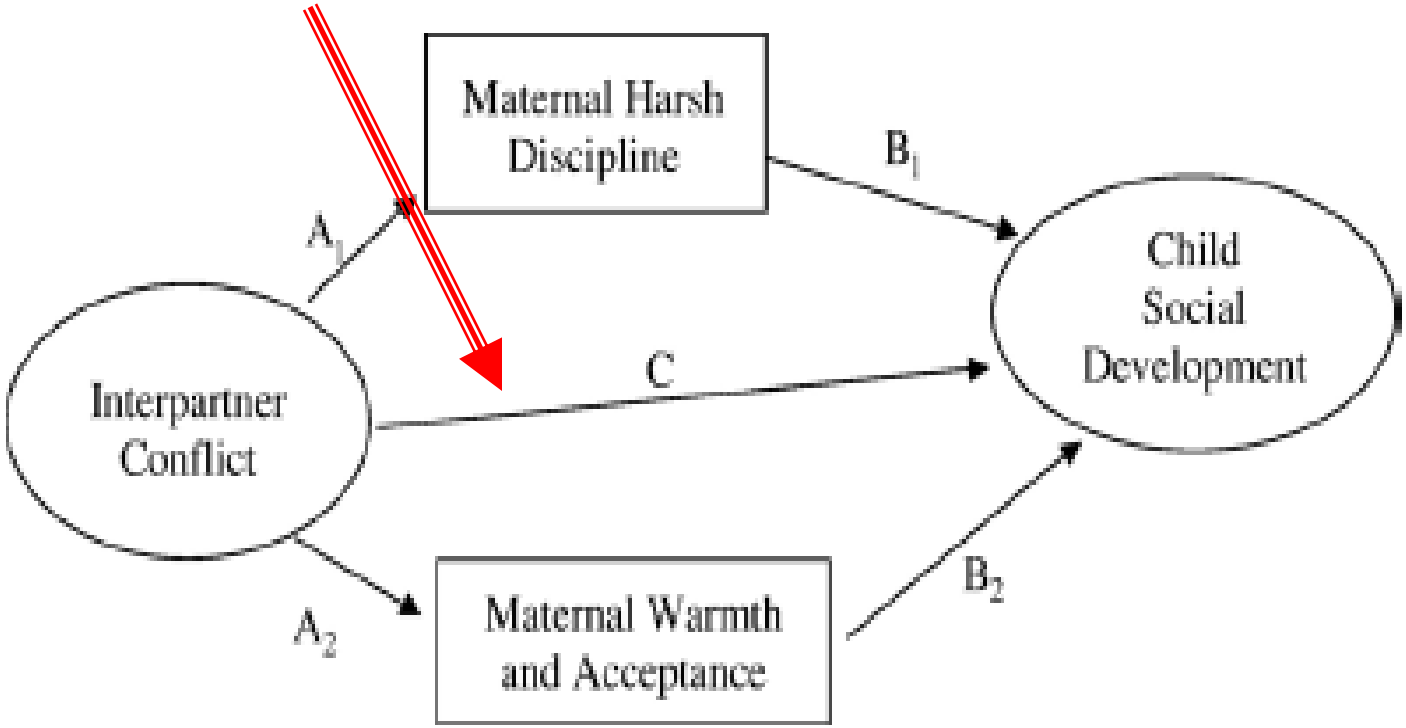
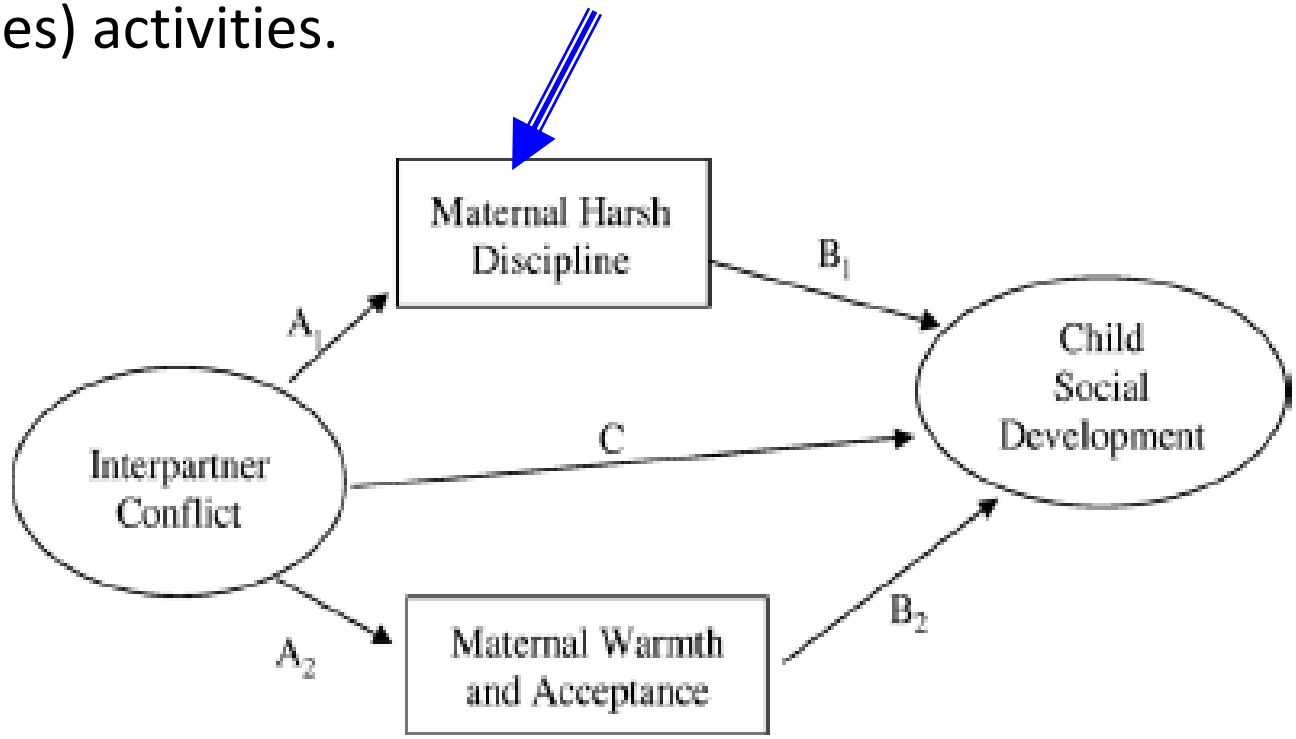
Consistent with literature and theory, children are worse off developmentally in this sample



Spillover Hypothesis

Mothers were significantly less responsive to infant distress and provided less social emotional growth (e.g. gentle touches) activities.

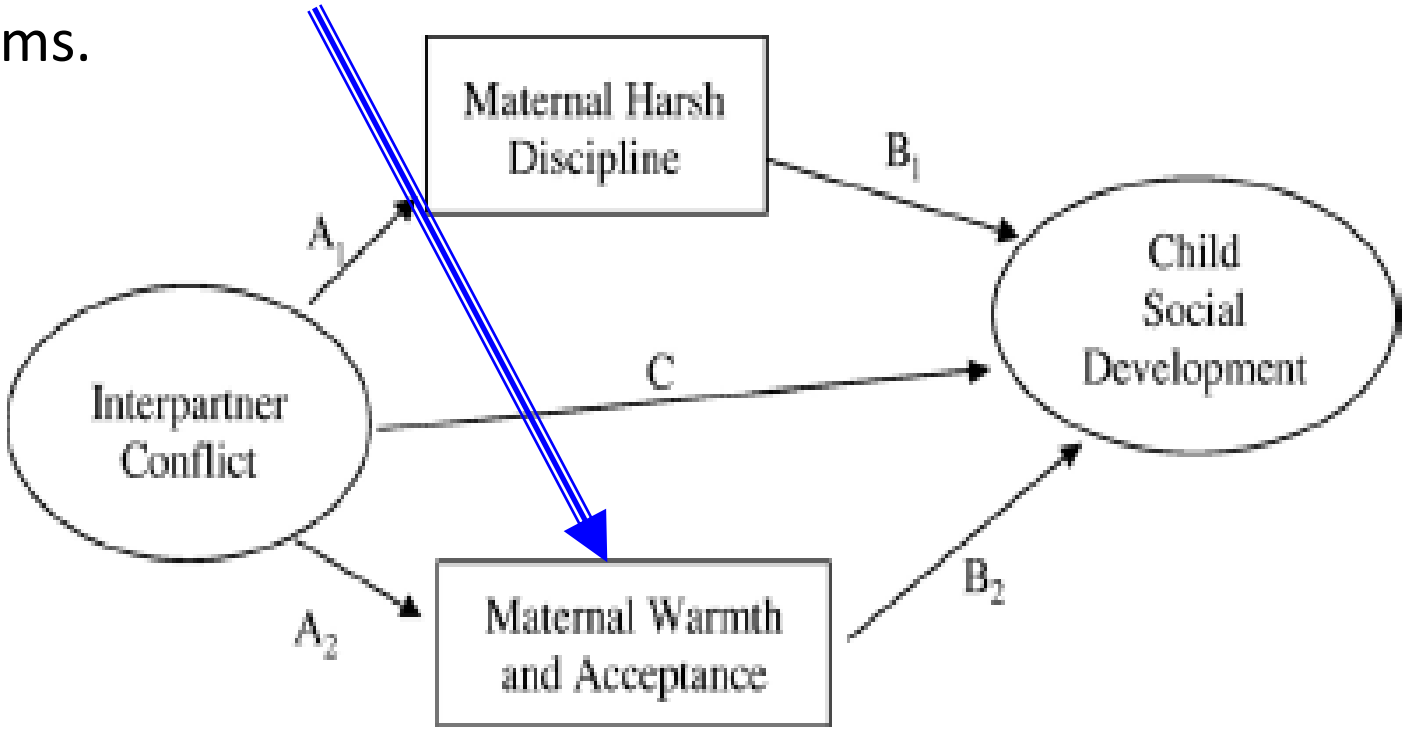


What mothers said: Mother-Infant Relationship

- *"Just being so fearful myself and trying not to be overly upset...so, you know, obviously it affected her and got her distraught. It kind of, definitely was not soothing her, if anything it was making her more hyper and insecure and uncomfortable, scared." – NB-26*
- *"I just completely, completely detached from <child> emotionally. He was fed, he was changed, he was put to bed.[...] Oftentimes he would be in distress and I would just put him down and look at him."* – NB-35

Compensation Hypothesis

Mothers were more sensitive and provided more cognitive growth fostering activities (e.g. singing, using rich language) than norms.



Compensation Hypothesis

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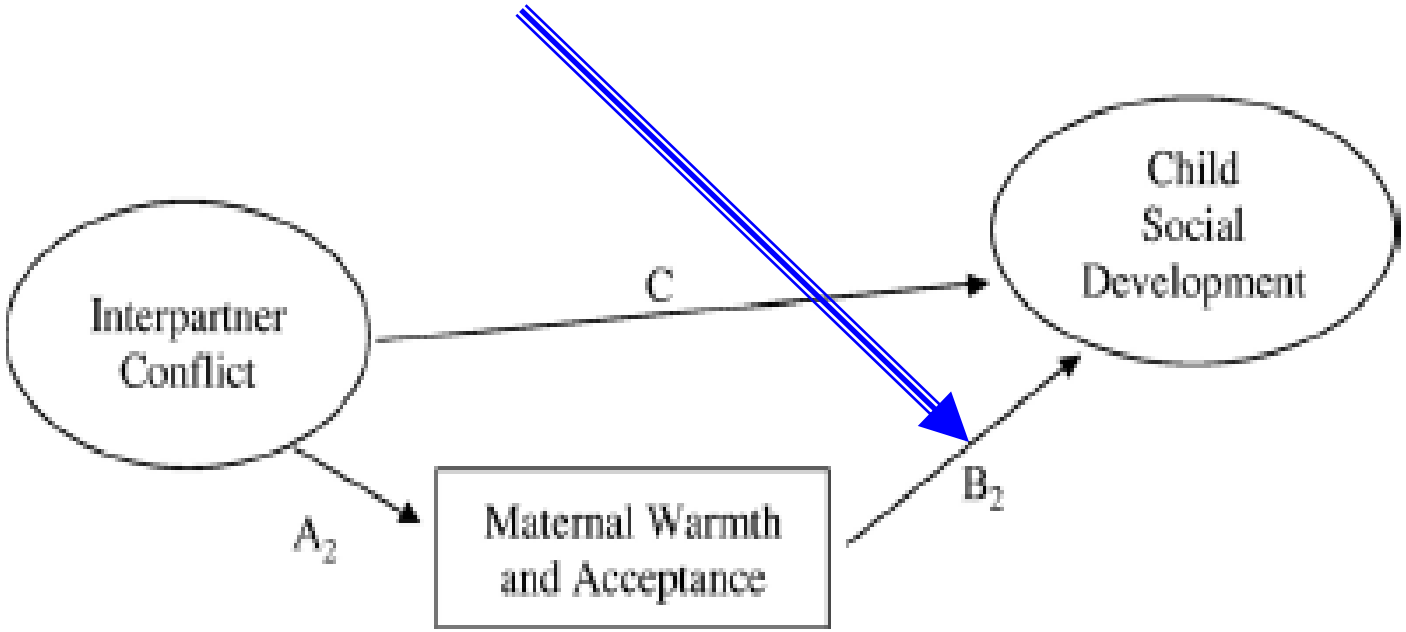
Higher cognitive growth fostering and overall maternal-infant interaction were correlated with improved communication and personal-social skills



What mothers said: Mother-Infant Relationship

- *"[I] would try and teach her things and read her books and sing to her and spend a lot of time with her, for the first eight months I never put her down." – NS-74*
- *"I tried to like cuddle her more and stuff like that because of everything that she had to see." – NB-31*
- *"… If he was crying or whatever, I would run to him and, and my mom would say, "Let him cry," you know. No I was always there. And I guess I was very protective of him you know. Very protective of him. I needed to." – NB-37*

What else is happening?

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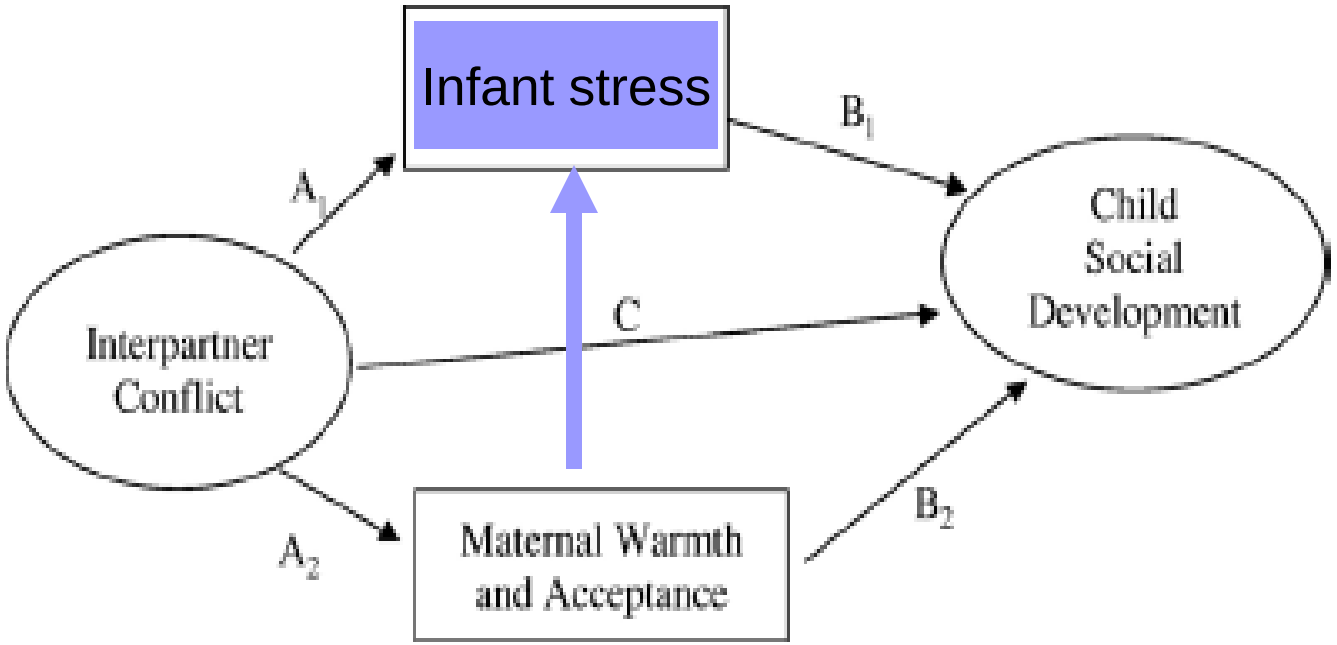
OVERALL Maternal-Infant Interactions

- Maternal-child interactions were of better quality than the norms.
- In all observations, the infants provided clearer cues and were much more responsive in interactions than the norms.

Future Research

Could infant stress explain part of the relationship between IPV and Child Development?



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Parental Stress (Postpartum depression)

Reduced parental sensitivity & responsiveness

Infant cortisol alterations

Altered child development

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Journal of Reproductive and Infant Psychology
2012, 1–21, iFirst article

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Cortisol patterns of depressed mothers and their infants are related to maternal–infant interactive behaviours

N. Letourneau[a,b], B. Watson[b], L. Duffett-Leger[b], K. Hegadoren[c] and P. Tryphonopoulos[b]

[a]Faculties of Nursing and Medicine (Pediatrics), University of Calgary, Alberta, Canada; [b]Child Health Intervention and Longitudinal Development, University of New Brunswick, Fredericton and University of Calgary, Alberta, Canada; [c]Faculty of Nursing, University of Alberta, Edmonton, Canada

(*Received 25 April 2011; final version received 12 November 2011*)

Background: Postpartum depression (PPD) reduces maternal–infant interaction quality, stresses infants and mothers, and is linked to adverse child social–emotional and cognitive developmental outcomes. **Objectives:** A hypothesised

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Depressed mothers

- negative perceptions of normal infant behavior
- ↓ likely to pick up on infants' cues or respond to needs
- ↓ emotionally expressive
- ↓ affectionate and ↑ anxious
- ↓ sensitive and appropriate interactions
- ↑ negative in their play
- speak more slowly and ↓ often

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Insecure Attachment

Primary caregiver :

- Insensitive
- Disengaged
- Uninvolved
- Emotionally flat
- Controlling

Infants develop:

- Self-protective strategies

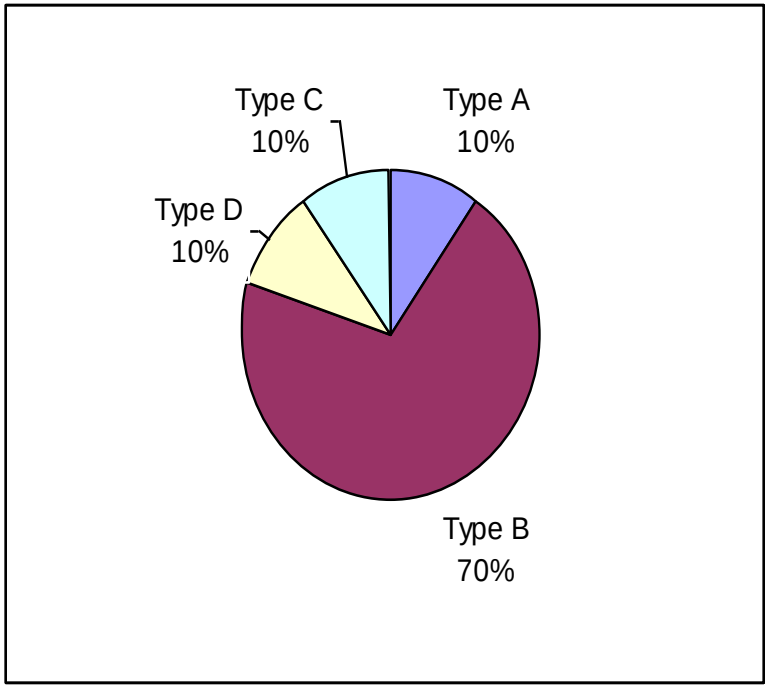
Maternal depression/distress

- PPD ↓ child developmental outcomes and maternal-child interaction quality (moderate to large effects) (Beck, 1995, 1996; Murray et al. 2003)

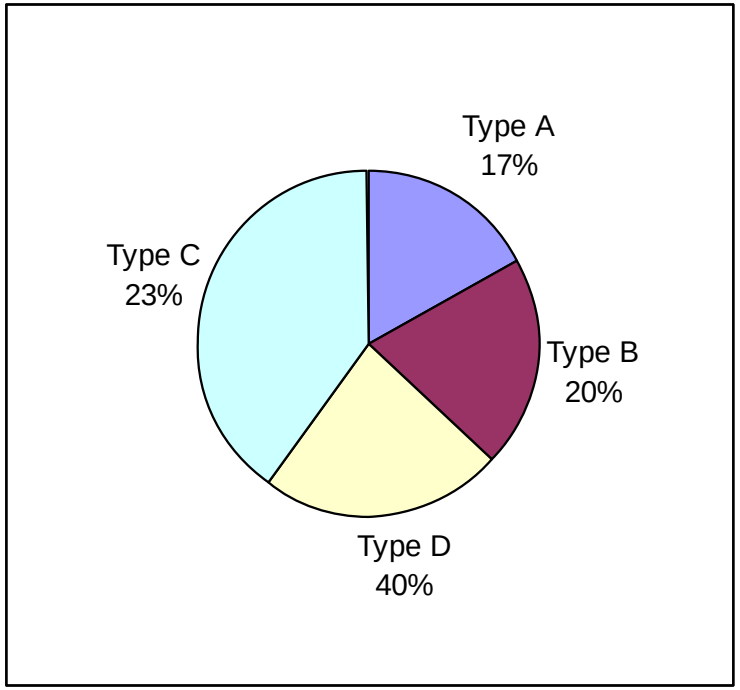
- Disturbances in mother-child interactions are observed at one year postpartum, even when mothers are no longer depressed.

PPD & Attachment: Infancy

Non-depressed



Depressed



Teti, Gelfand, Messinger, & Isabella (1995)

PPD & Attachment: Preschoolers

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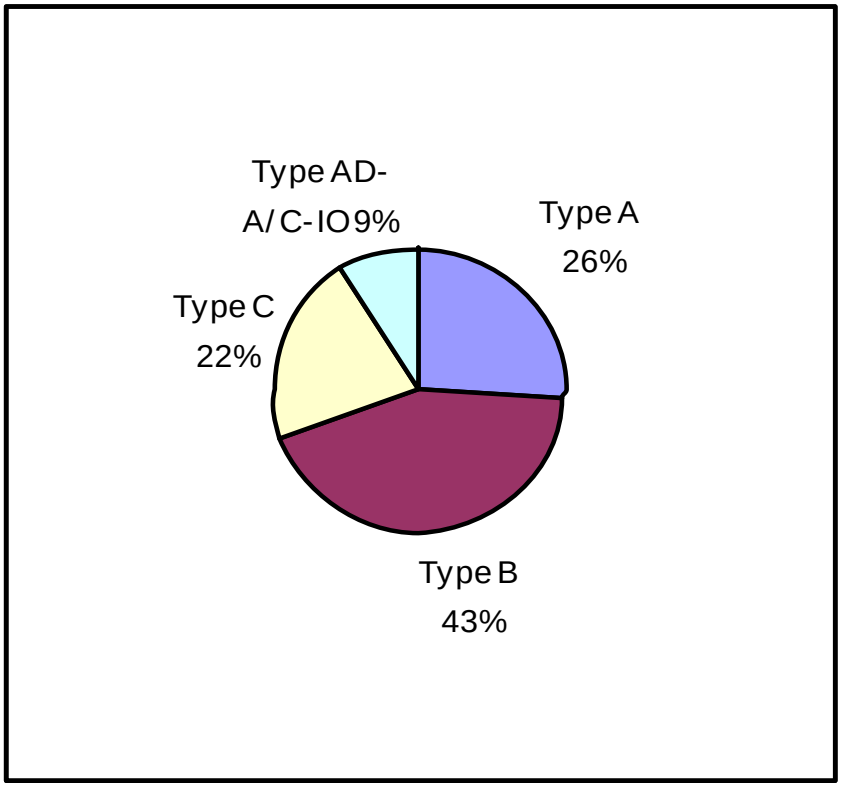
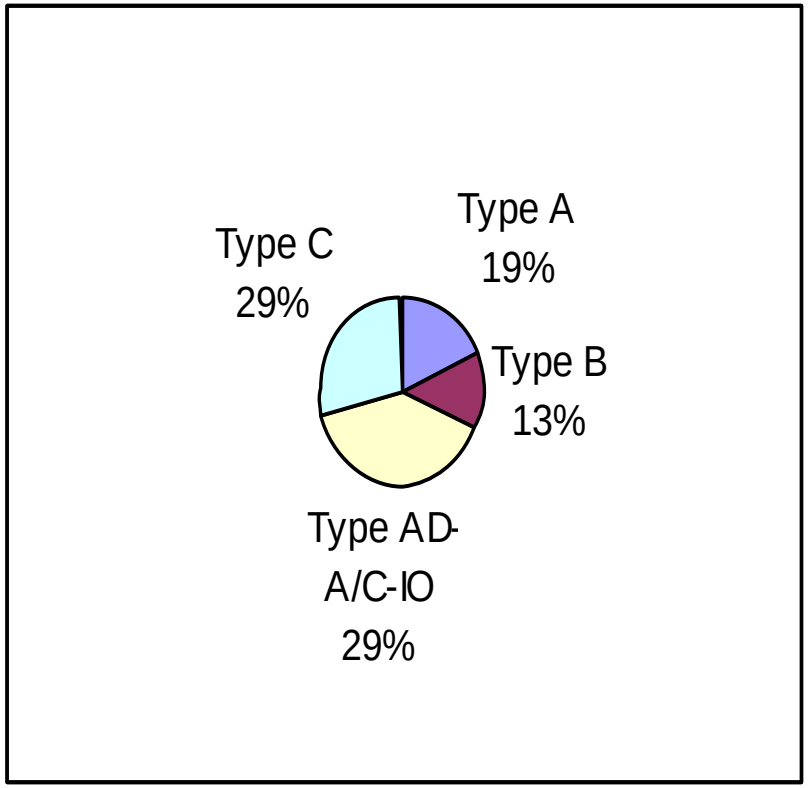
Non-Depressed



Depressed



Teti, et al. (1995).

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Parental stress (Postpartum depression)

Reduced parental sensitivity & responsiveness

Infant cortisol alterations

Altered child development

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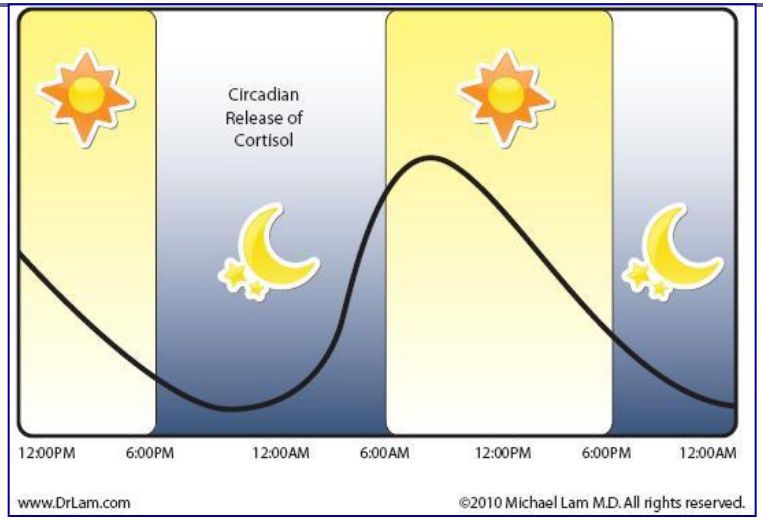
Hypothalamic-Pituitary Adrenal (HPA) Axis



Cortisol is secreted by the adrenal cortex via pulsations that follow a 24-hour (diurnal) circadian profile (Hellhammer, 2009)

Stressors (like exposure to maternal PPD) stimulate the activation of the HPA which triggers the release of the steroid hormone cortisol from the adrenal gland (Essex, 2002)

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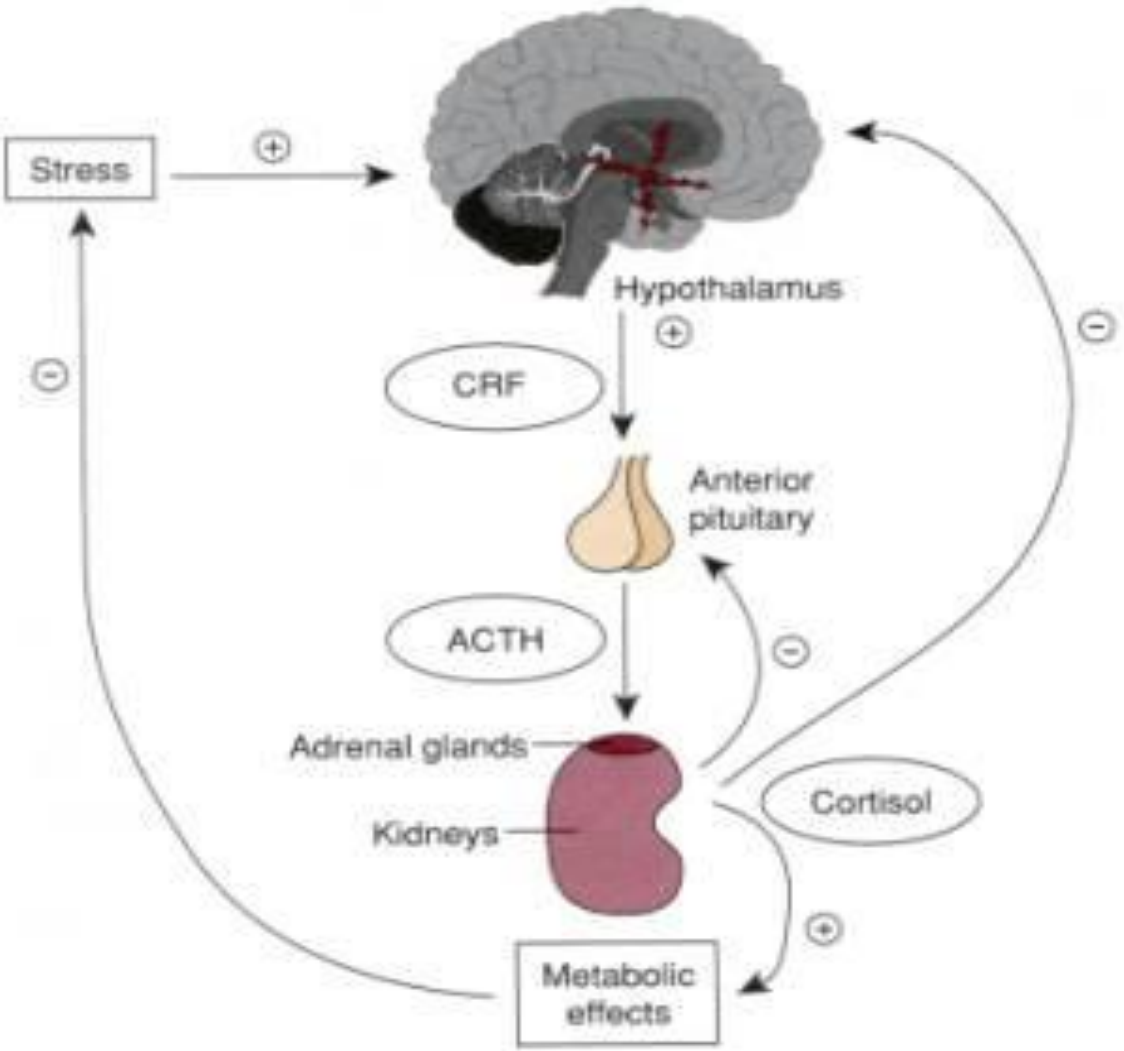
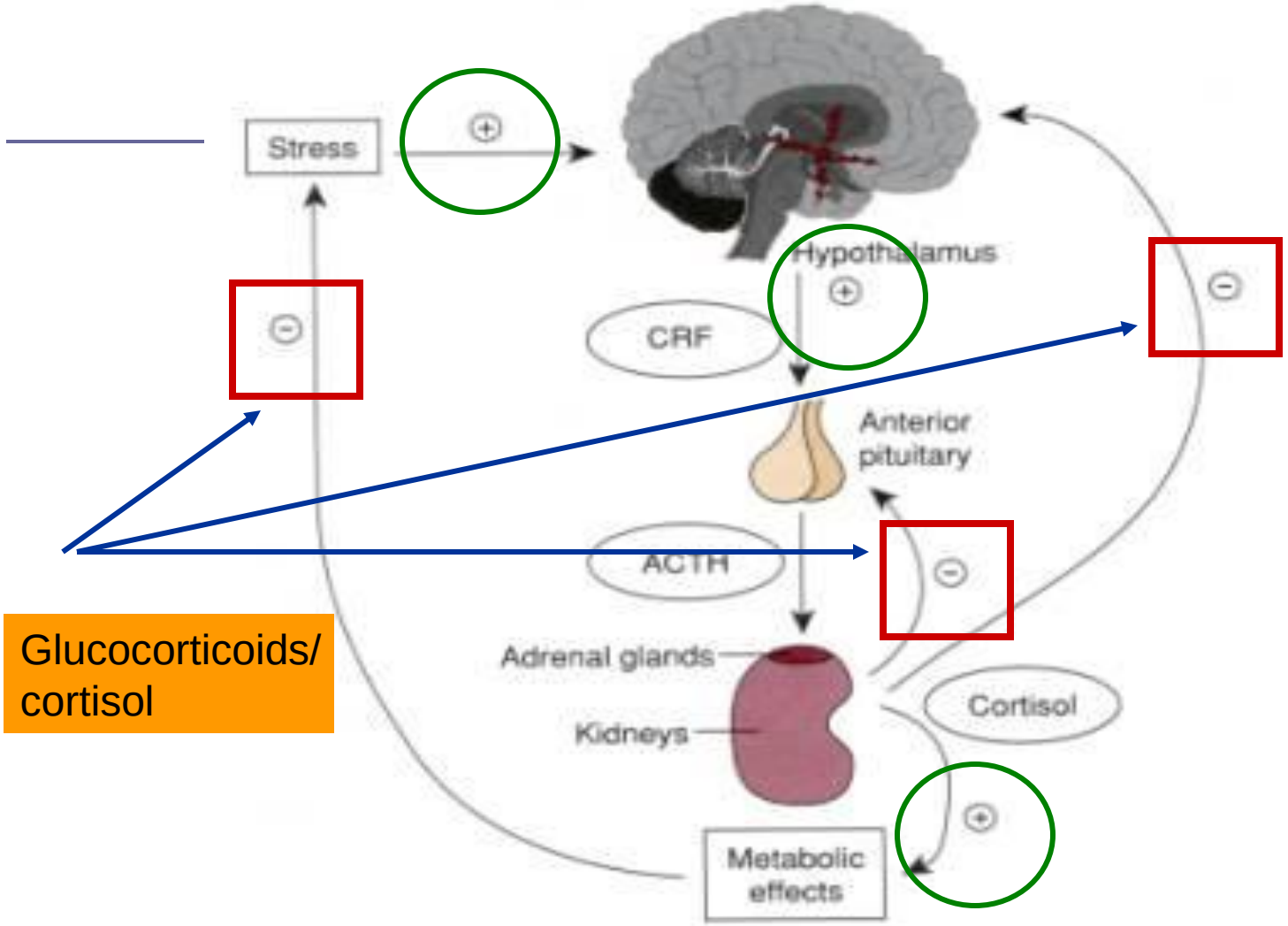

Stress
Hypothalamus
CRF
Anterior pituitary
ACTH
Adrenal glands
Kidneys
Cortisol
Metabolic effects



Glucocorticoids/ cortisol

HPA Axis

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- Sensitive periods of enhanced brain plasticity vulnerable to long-term effects of cortisol
- Over-activation of the HPA system related to:
  - decreases in brain volume
  - inhibition of neurogenesis
  - disruption of neuronal plasticity
  - abnormal synaptic connectivity

  (Gunnar, 2009)

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Overactivation of HPA

- Maladaptive: fear behaviours and hypervigilance
- In children, altered cortisol linked to reduced cognition, memory, attention, self-control, behavioral problems
- Cortisol is neurotoxic, known to interfere with normal maturation of brain and other body systems

HPA Axis

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Prolonged exposure to elevated levels of cortisol predict:

- increased insulin resistance
- obesity
- diminished immune responses
- reduced cognition, memory
- fear behaviours, hypervigilance
- attention deficits, behavioural problems
- disturbances with emotional regulation & self control

(Essex, 2002, Gunnar, 1998)

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Infant Cortisol: Predictors of Alterations

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- Deprived caregiving (Romanian orphan)
- Milder variations in care (day care)
- Family adversity (low birth weight, income, single parenthood, hostile maternal behaviours)

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Depression & Child Cortisol

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- Infants, 3 year olds, 6-8 year olds, (r=.22, p<.005; Lupien et al., 2000) and13 year olds of depressed mothers display higher cortisol levels than children of non-depressed mothers.

- Months of exposure to PPD in child's first year of life is potent predictor of ↑cort levels .

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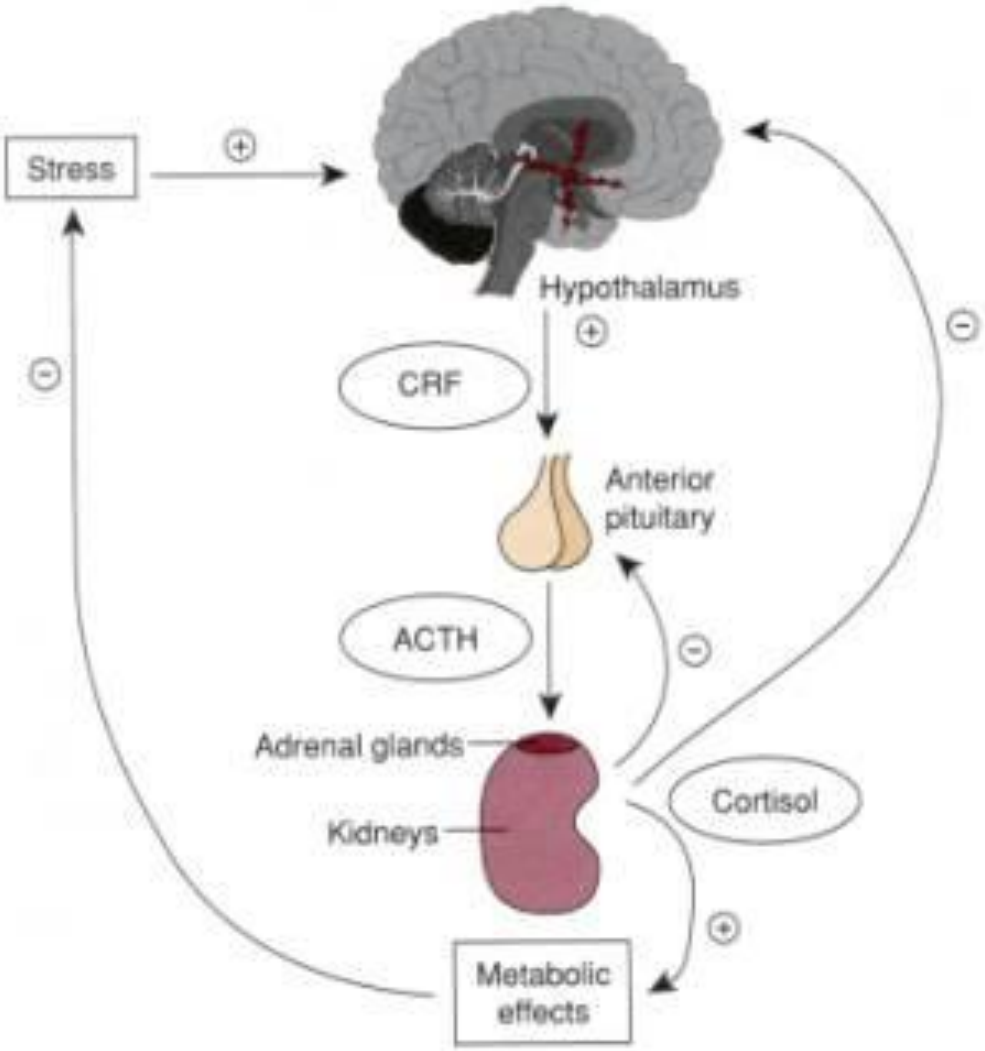
Maternal Child Interaction Quality?



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Journal of Reproductive and Infant Psychology
2012, 1–21, iFirst article

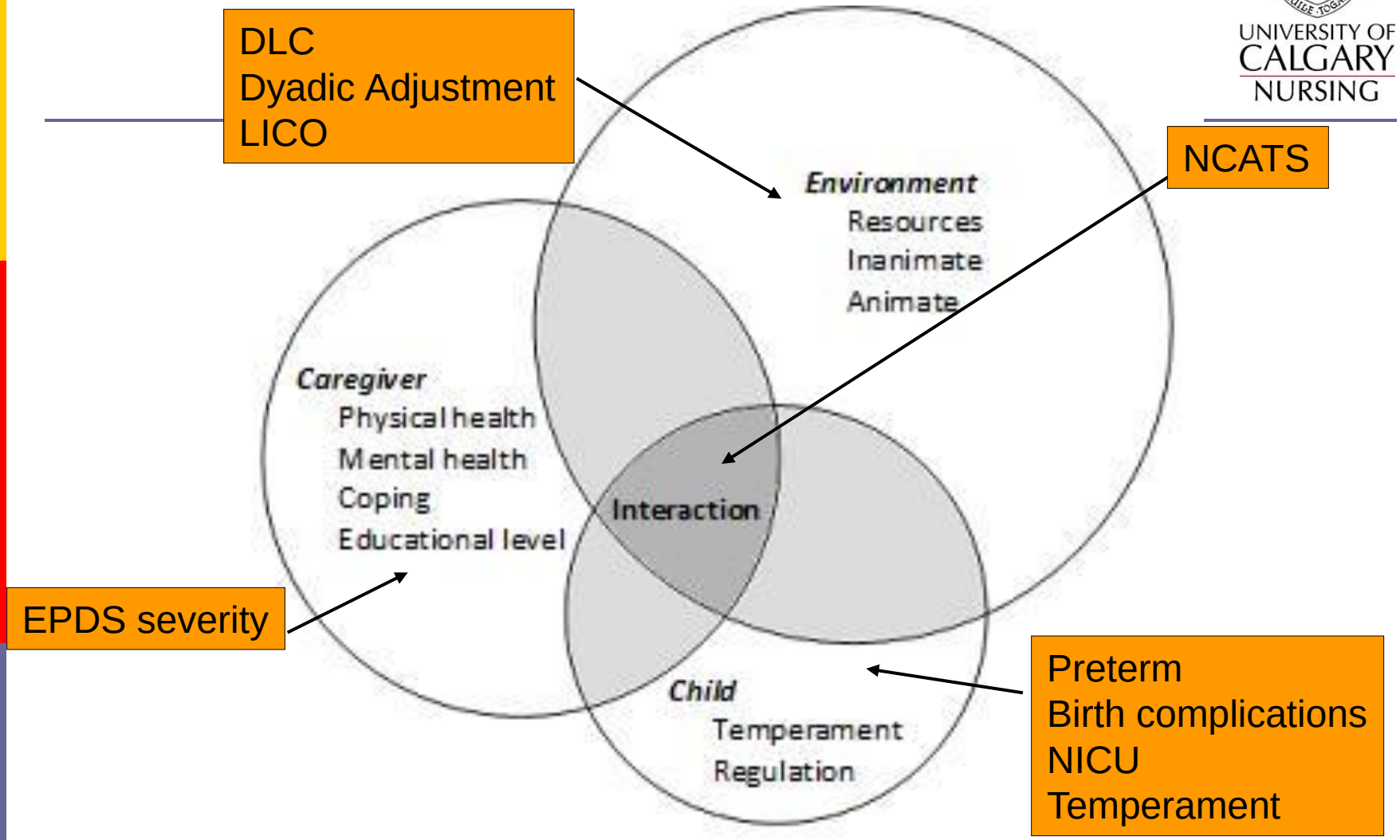
Routledge
Taylor & Francis Group

Cortisol patterns of depressed mothers and their infants are related to maternal–infant interactive behaviours

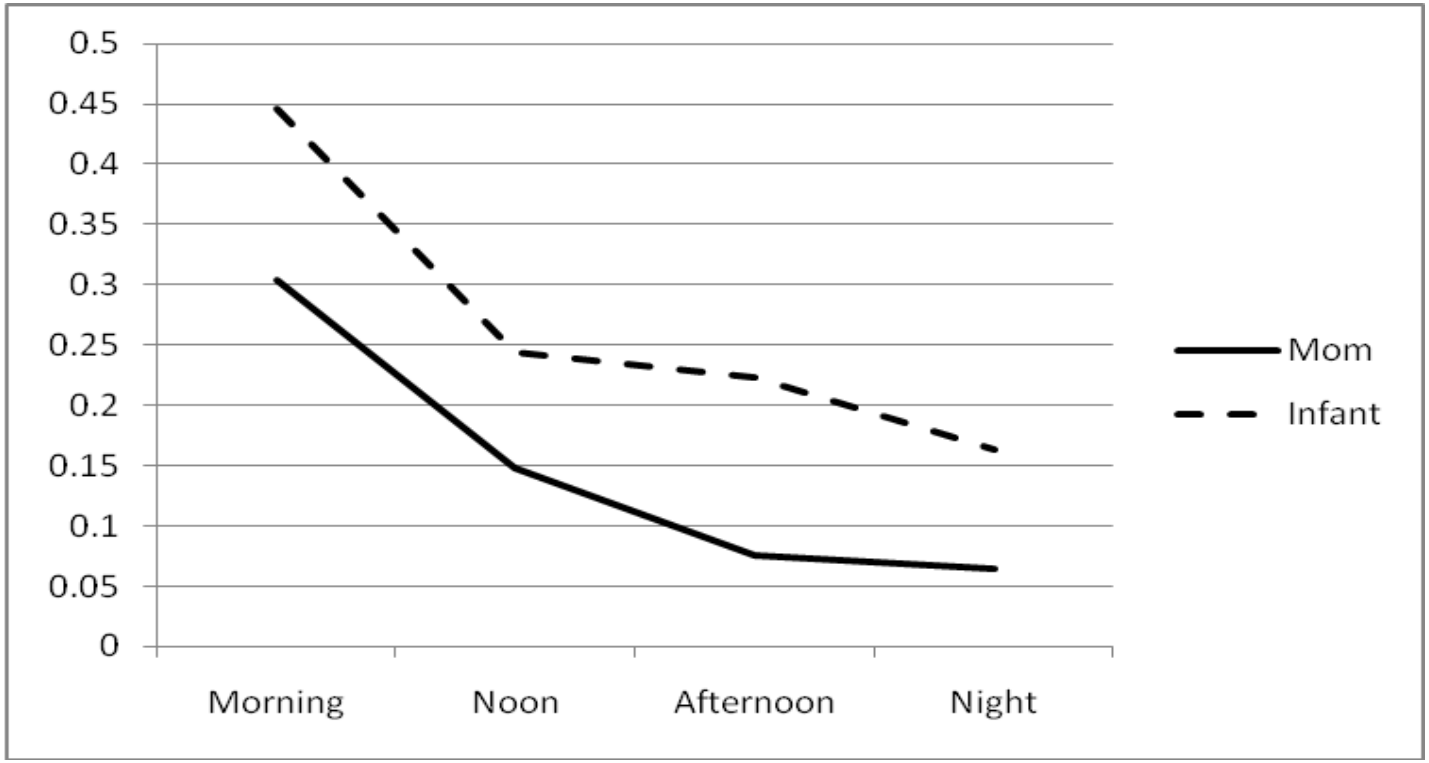
N. Letourneau[a,b], B. Watson[b], L. Duffett-Leger[b], K. Hegadoren[c] and P. Tryphonopoulos[b]

[a]*Faculties of Nursing and Medicine (Pediatrics), University of Calgary, Alberta, Canada;* [b]*Child Health Intervention and Longitudinal Development, University of New Brunswick, Fredericton and University of Calgary, Alberta, Canada;* [c]*Faculty of Nursing, University of Alberta, Edmonton, Canada*

(*Received 25 April 2011; final version received 12 November 2011*)


DLC
Dyadic Adjustment
LICO
NCATS
Environment
Resources
Inanimate
Animate
Caregiver
Physical health
Mental health
Coping
Educational level
Interaction
EPDS severity
Child
Temperament
Regulation
Preterm
Birth complications
NICU
Temperament

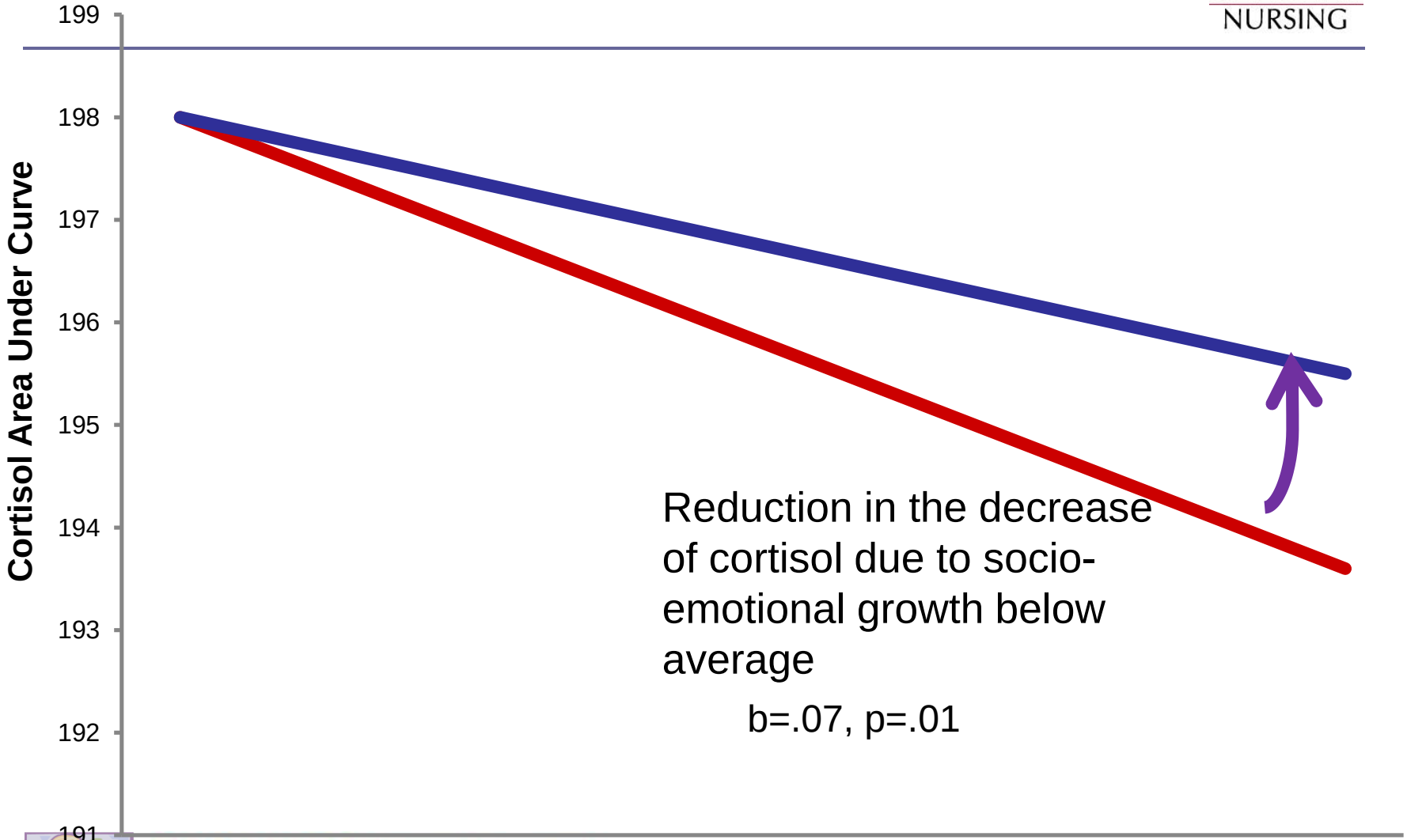
Diurnal Rhythm



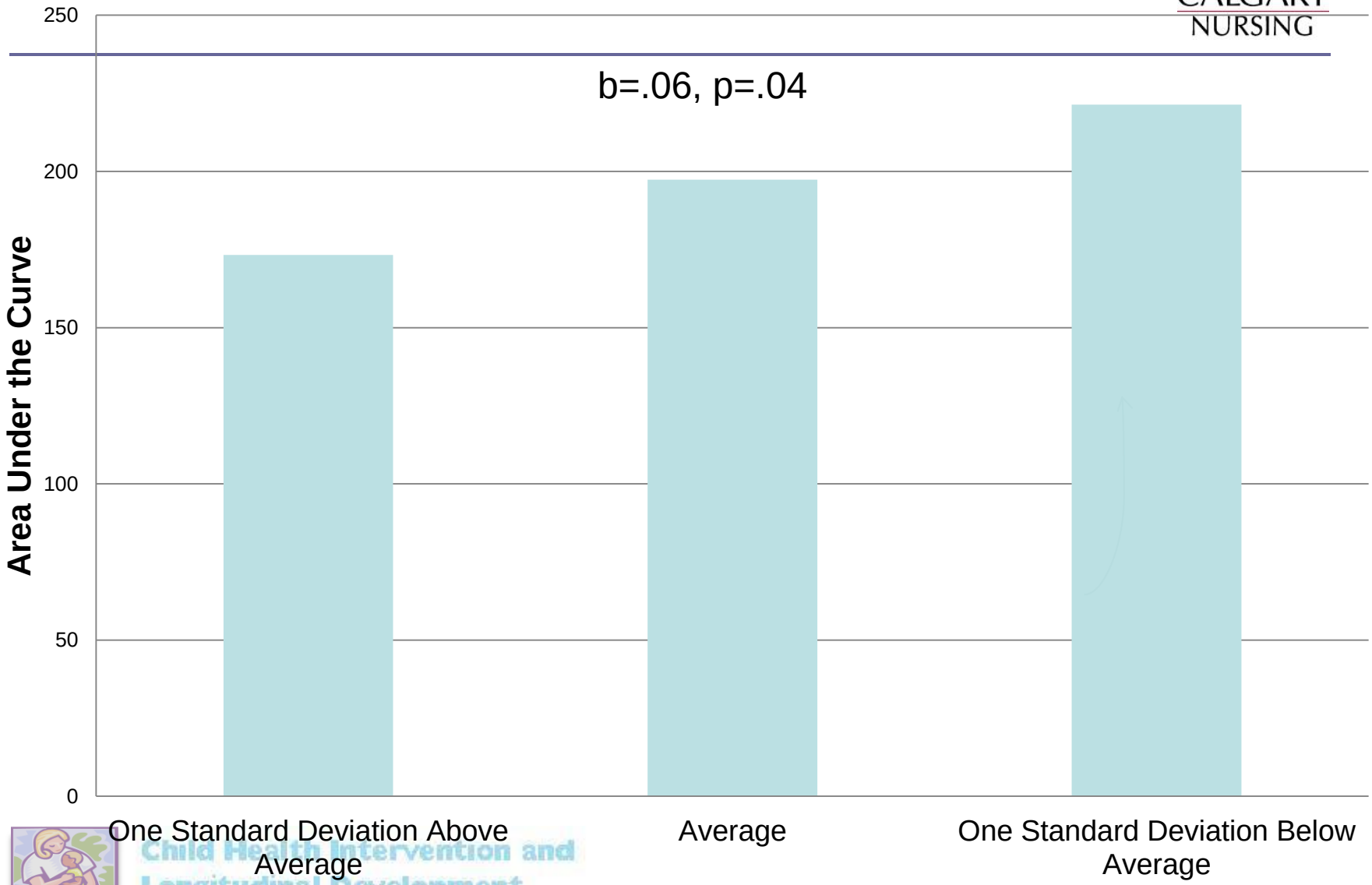
Results

- Infants of depressed mothers produce more cortisol
- However it wasn't how depressed mothers were that made the difference, it was how sensitive and responsive mothers were to their infants.
- Mothers who were less sensitive and responsive had infants with higher cortisol over the day
  - They played with, talked to, made eye contact, touched, and praised their children less

Predicted Reduction in the Daily Decrease of AUC



Predicted Cortisol For Different Cognitive Growth Levels



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Summary: Infant Cortisol

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- Infants show an afternoon flattened pattern.
- ↑ cognitive growth fostering activities predict ↓ concentrations of infant cort over the day
- ↓ average social-emotional growth fostering activities predict ↓ of a decline in cort over the day (flatter decline).

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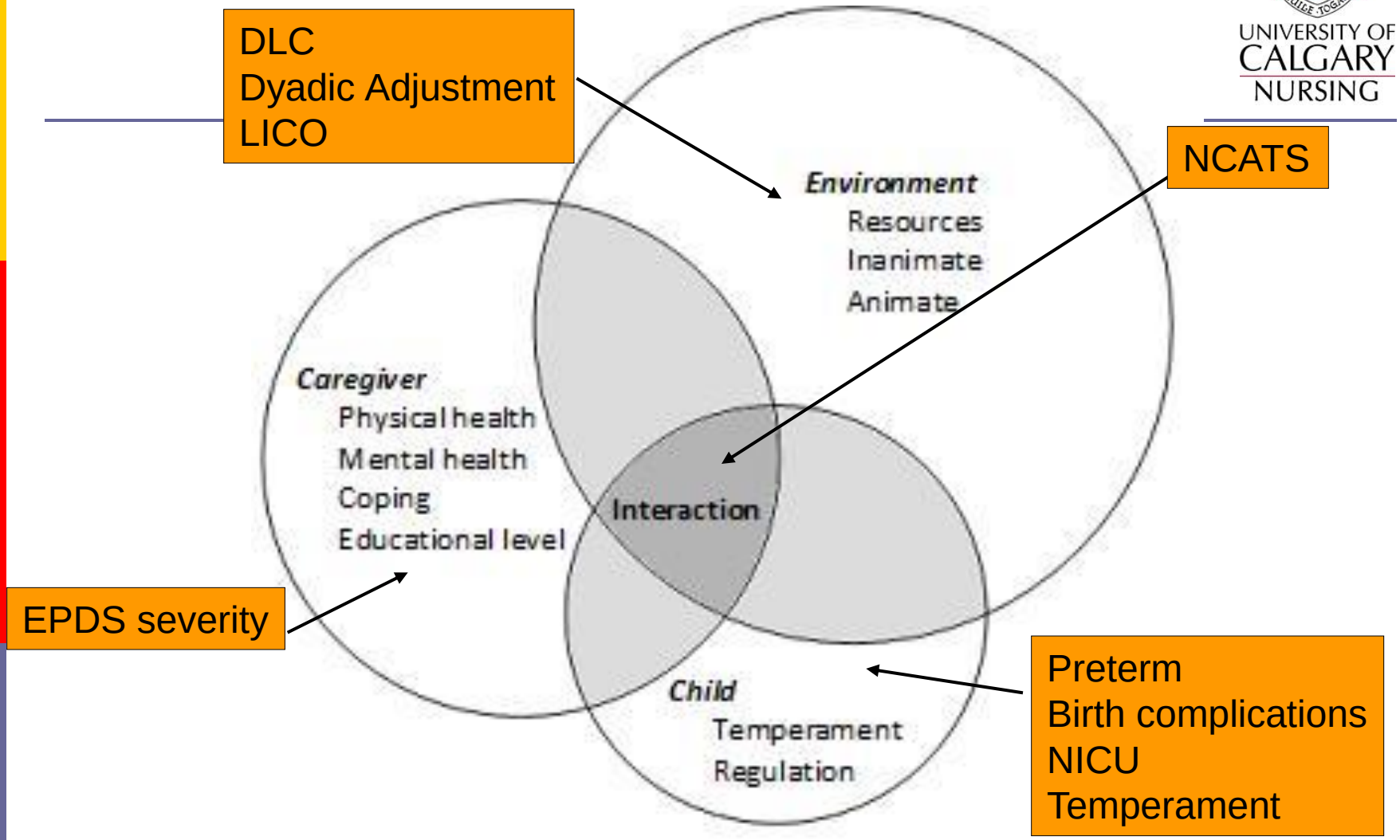
DLC
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Environment
Resources
Inanimate
Animate
Caregiver
Physical health
Mental health
Coping
Educational level
Interaction
EPDS severity
Child
Temperament
Regulation
Preterm
Birth complications
NICU
Temperament

Follow-up (in review)

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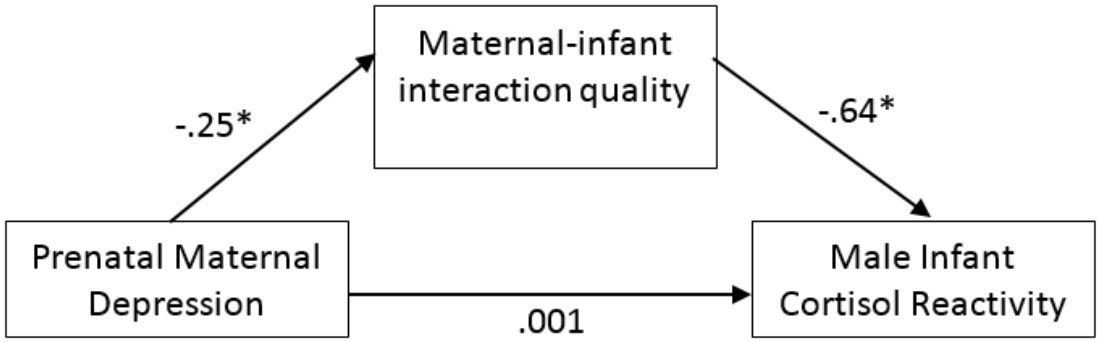
a)



b)

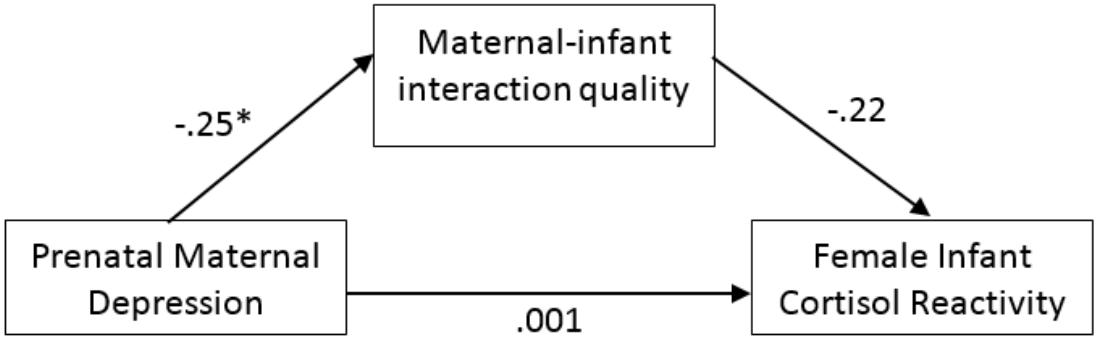


Figure 2. Standardized regression coefficients for the relationship between prenatal depression and infant cortisol reactivity as mediated by maternal-infant interaction quality. a) Significant mediation for male infants b) No mediation for female infants.

Follow-up (in review)

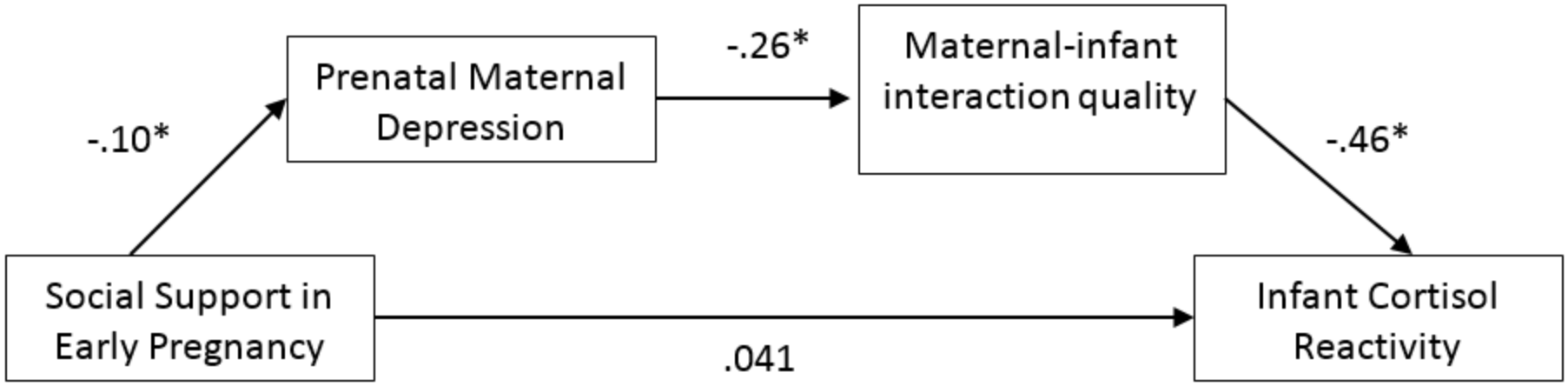


Figure 3. Standardized regression coefficients for the relationship between social support and infant cortisol reactivity as mediated by prenatal depression and maternal-infant interaction quality. Maternal education, gestational age at birth, infant sex, and postnatal depression were included as covariates.

Follow-up (in review)

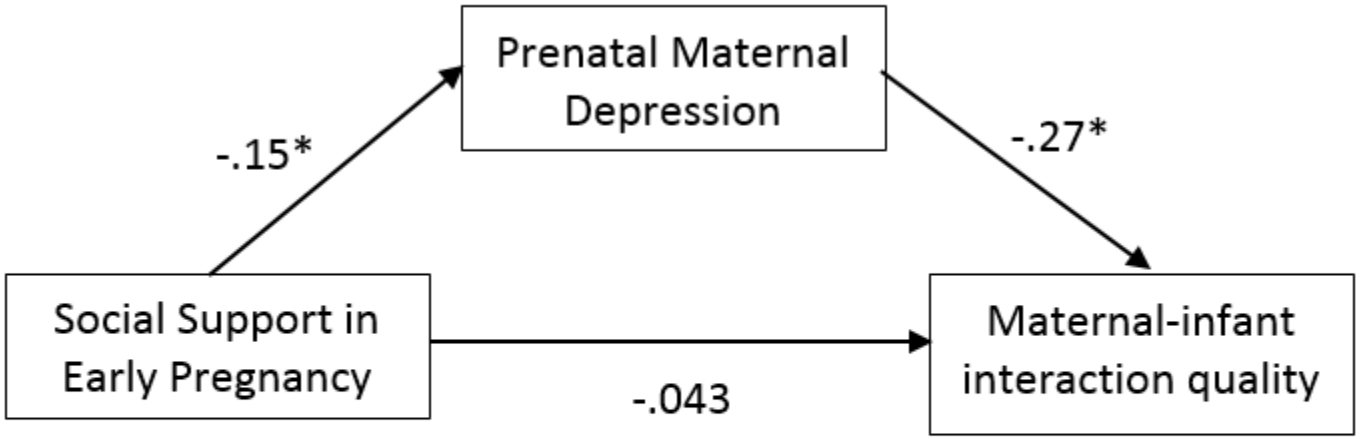


Figure 2. Standardized regression coefficients for the relationship between social support and maternal-infant interaction quality as mediated by prenatal depression. Maternal education, gestational age at birth, infant sex, and postnatal depression were included as covariates.

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Parental stress → Reduced parental sensitivity & responsiveness → Reduced Heart Rate Variability to Stress → Altered child development

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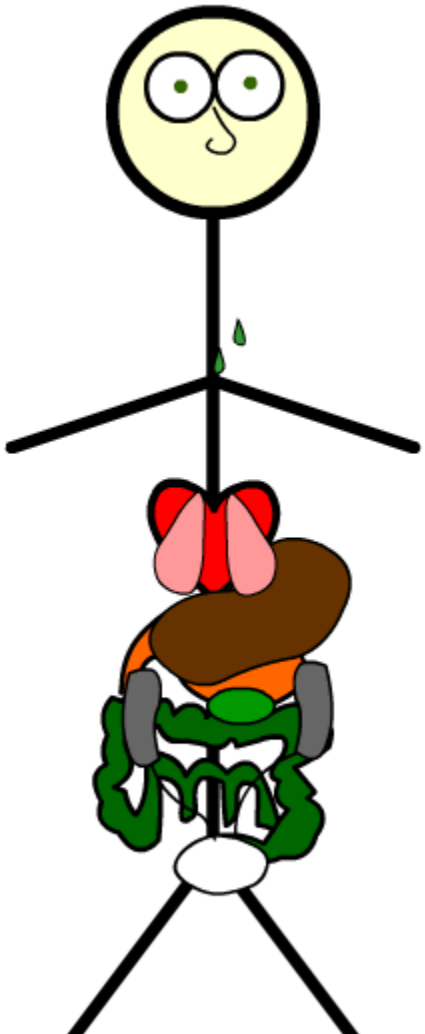
Mothers and fathers are "hidden" regulators of their infants' endocrine & nervous systems via parent-child relationship qualities

Parasympathetic Nervous System



The parasympathetic nervous system slows the heart rate down, makes the pupils contract, stimulates digestion, causes nasal secretion, stimulates the liver, bladder, and kidneys, causes constriction inside the lungs, ...

Sympathetic Nervous System

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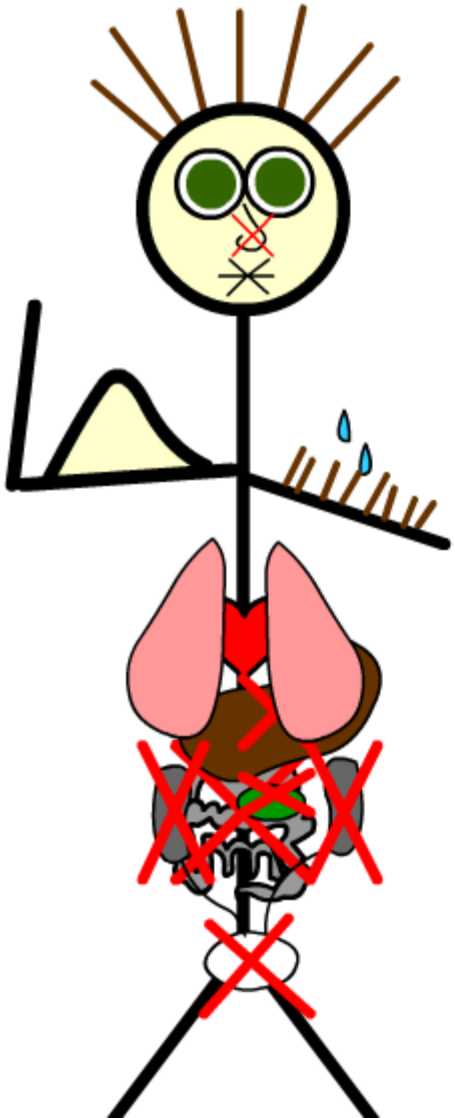

The sympathetic nervous system increases heart rate, makes the pupils dilate, inhibits digestion, inhibits nasal secretions, inhibits production of saliva, inhibits the liver, kidneys, and gall bladder, stimulates sweating, causes piloerection, makes the lungs dilate, increases muscle strength, ...

PNS

PNS control over high frequency heart rate variability (HFHRV) is related to self-regulation, temperament, affect and attention.

PNS

- The PNS is directly responsible for beat-to-beat changes in the frequency of heart rate.
- In healthy individuals, we expect beat-to-beat changes in HR associated with breathing; healthy, non-stressed individuals make these adjustments beat to beat
- In stressed individuals, beat-to-beat variability is reduced; efficiency in function is foregone in favour of stress-preparedness
- PNS function is frequently indexed by measuring changes in the interbeat interval associated with respiration=high frequency heart rate variability (HFHRV).

Higher resting HFHRV associated with

- ↓ temperamental difficulty and ↑ self-soothing and state regulation (Stifter & Fox, 1990)
- ↑ sustained visual attention and attentional control (Richards & Cronise, 2000)
- ↑ secure attachment (Izard et al., 1991)
- ↑ social and explorative behaviour (Fox, 1989)
- ↑ appropriate behavioural reactivity (Porges et al, 1996)

HFHRV—Stress reactivity

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During a stress test, suppression of HFHRV (reflecting PNS withdrawal & SNS dominance) in response to a stressor is believed to reflect a physiological strategy that permits more effective regulation, sustained attention and behaviours indicative of active coping.

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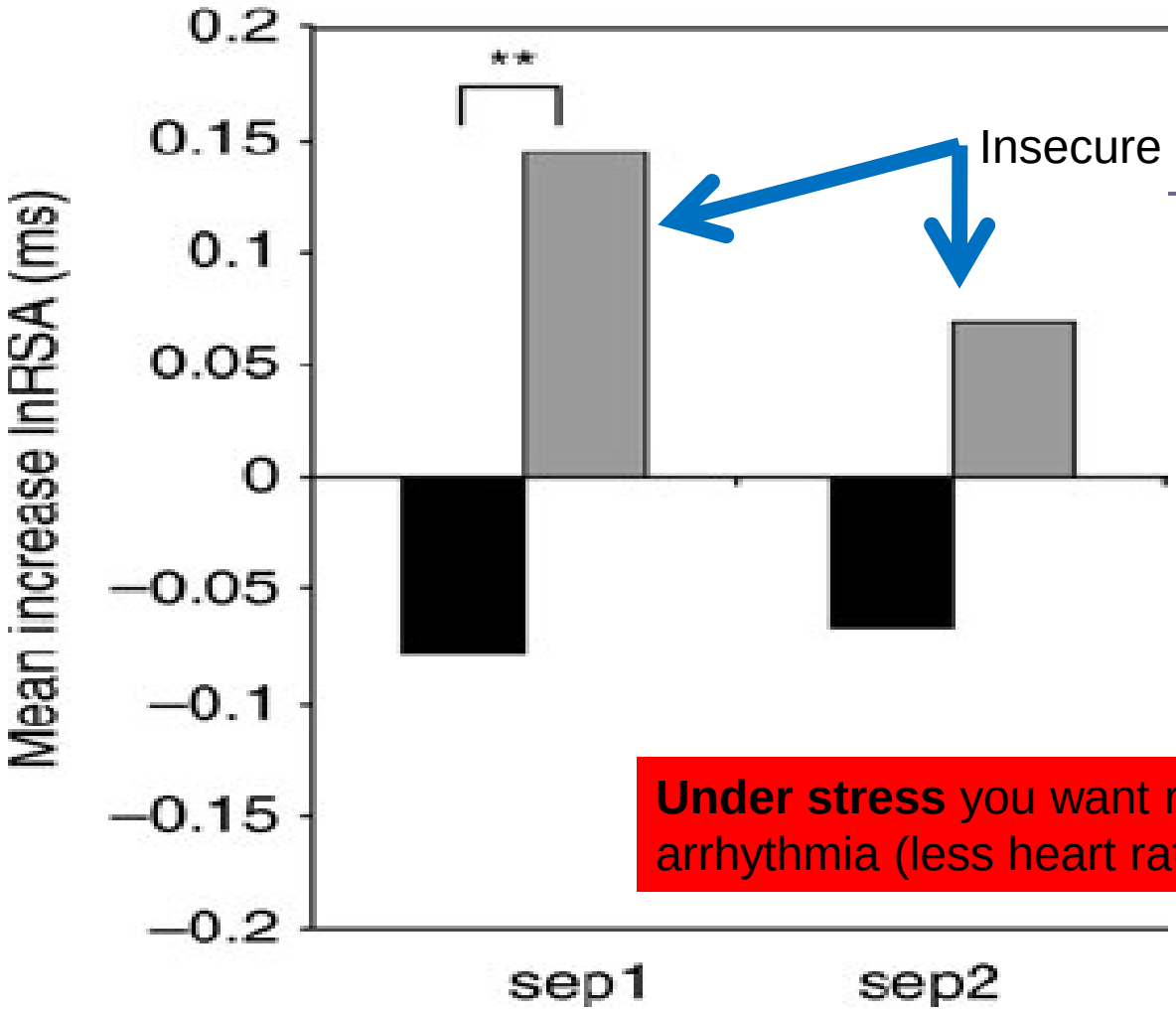
HFHRV

The way a caregiver responds to the needs of an infant may have an impact on developing adaptive methods to modulate physiological stress by infants' progressively internalizing the regulation strategies used with the dyad during the earlier months (Propper, 2008)



Under stress you want reduced arrhythmia (less heart rate variability)

Osterman et al., 2010, Child Development**p<.05

Remember: You want more RSA at rest; more efficient

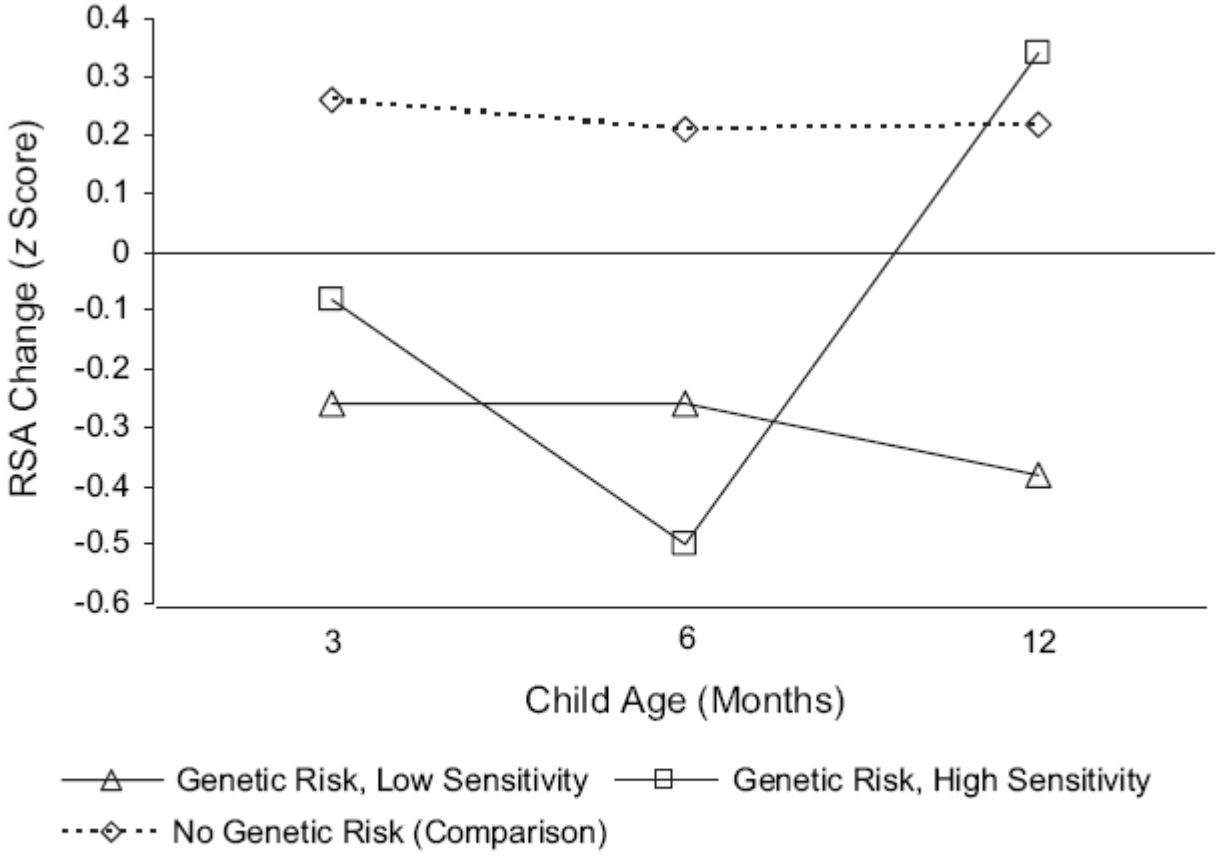
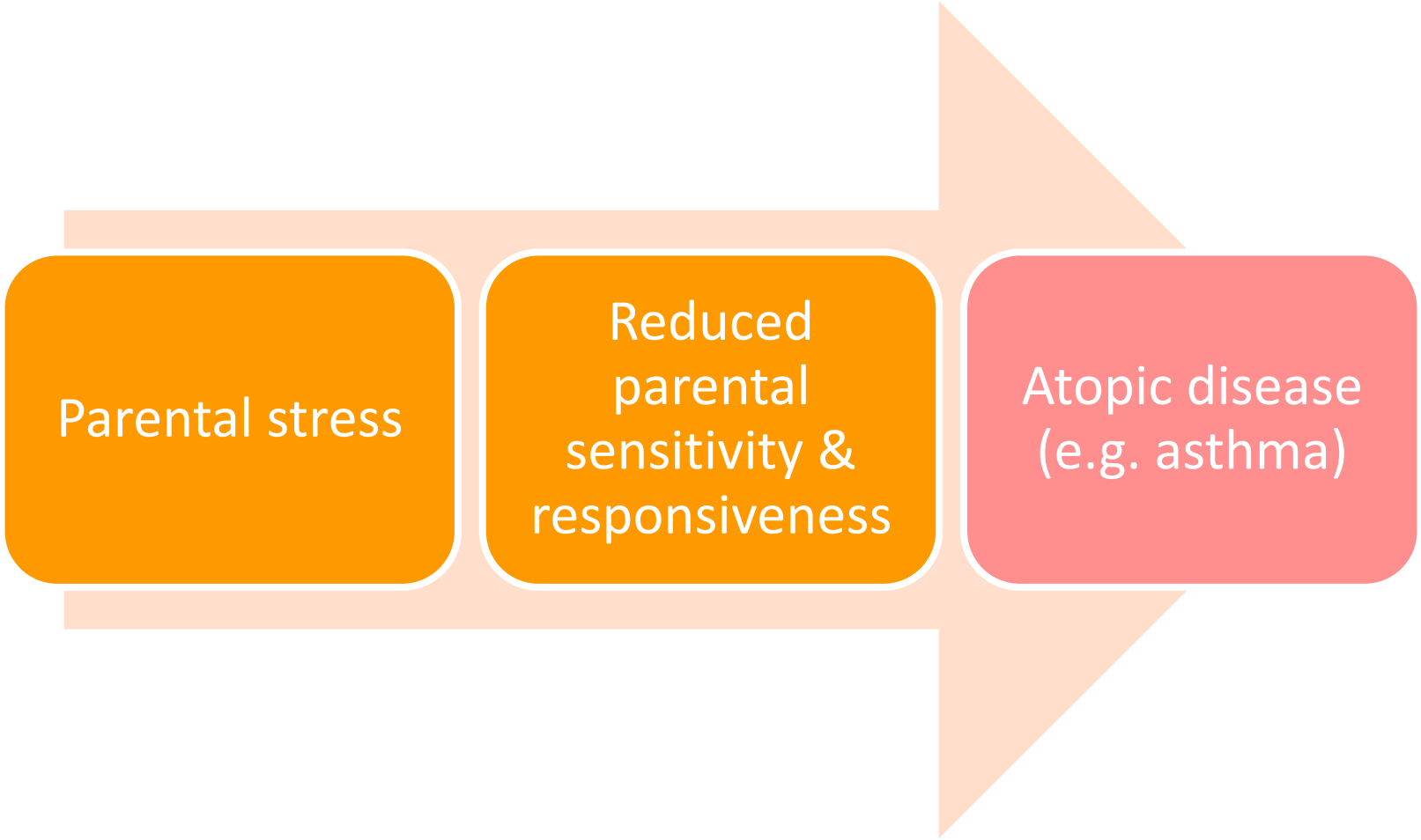


Figure 1. Maternal sensitivity moderates the relation between *DRD2* and infant change in respiratory sinus arrhythmia at 12 months.

Propper et al., 2008. Child Development

Maternal sensitivity compensated for the possible genetic predisposition to have poor reduction of High Frequency Heart Rate Variability in response to stress.


Parental stress
Reduced parental sensitivity & responsiveness
Atopic disease (e.g. asthma)

Asthmatic disease

- Neural and endocrine responses that result from stress drive immune responses in infants toward the development of asthma.

- Part of “atopic march” from inflammatory skin conditions, to allergies, to asthma

Under Normal Conditions

Glucocorticoids like cortisol, inhibit production of pro-inflammatory cytokines such as:

- Interleukin (IL)-2
- tumor necrosis factor-(TNF)-α
- Interferon (IFN)-γ

Cortisol also stimulates anti-inflammatory cytokines to prevent overshoot of pro-inflammatory cytokines

Toxic stress

- Chronic caregiver stress in the first 6 months is associated with inhibition of pro-inflammatory cytokines in infants.
- Under conditions associated with change in stress system activity, such as chronic stress, through modulation of the pro/anti-inflammatory cytokine balance, stress may suppress or potentiate autoimmune diseases.

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PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Onset and Persistence of Childhood Asthma: Predictors From Infancy

Mary D. Klinnert, Harold S. Nelson, Marcella R. Price, Allen D. Adinoff, Donald Y. M. Leung and David A. Mrazek

Pediatrics 2001;108;69-
DOI: 10.1542/peds.108.4.e69

Child Health Intervention and Longitudinal Development

Klinnert 2001

Parenting difficulties and psychosocial stress at 3 weeks of infant age predicted asthma in children at age 6 years

Parenting difficulties=maternal depression, lack of marital support, emotional unavailability to the child and poor behavioural regulation strategies of children by parents

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Continued Exposure to Maternal Distress in Early Life Is Associated with an Increased Risk of Childhood Asthma

Anita L. Kozyrskyj[1,2,3], Xiao-Mei Mai[1], Patrick McGrath[4], Kent T. HayGlass[5], Allan B. Becker[3], and Brian MacNeil[6]

[1]Faculty of Pharmacy, [2]Department of Community Health Sciences, Manitoba Centre for Health Policy, and [3]Department of Pediatrics and Child Health, Faculty of Medicine, University of Manitoba, Winnipeg, Manitoba, Canada; [4]Department of Psychology, Faculty of Science, Dalhousie University, Halifax, Nova Scotia, Canada; and [5]Department of Immunology, Faculty of Medicine, and [6]School of Medical Rehabilitation, University of Manitoba, Winnipeg, Manitoba, Canada

Rationale: Evidence is emerging that exposure to maternal distress in early life plays a causal role in the development of childhood asthma.
Objectives: Because much of the data are from high-risk cohorts, we undertook a birth cohort study in a complete population of children to test this association.
Methods: Using Manitoba, Canada's, health care and prescription databases, this longitudinal study assessed the association between maternal distress during the first year of life and onward, and asthma at age 7 in a 1995 birth cohort of 13,907 children.
Measurements and Main Results: Maternal distress was defined on the basis of health care or prescription medication use for de-

AT A GLANCE COMMENTARY

Scientific Knowledge on the Subject

Evidence is emerging from animal models and high-risk birth cohorts that exposure to maternal distress in early life plays a causal role in the development of childhood asthma.

What This Study Adds to the Field

Child Health Intervention and Longitudinal Development

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TABLE 4. RISK OF ASTHMA AT AGE 7 SUBSEQUENT TO EXPOSURE TO MATERNAL DISTRESS AND OTHER ENVIRONMENTAL FACTORS

	Crude OR (*95% CI*)	Adjusted OR* (*95% CI*)	Additional Adjustment†
Maternal distress only at first year versus none (reference)	1.14 (0.86–1.52)	1.08 (0.81–1.44)	1.05 (0.79–1.41)
Short-term maternal distress versus none	1.22 (0.89–1.66)	1.07 (0.78–1.47)	1.00 (0.72–1.37)
Long-term maternal distress versus none	1.63 (1.33–2.00)	1.34 (1.09–1.66)	1.25 (1.01–1.55)

Kozyrskyj, 2008. J of Respiratory Care Medicine

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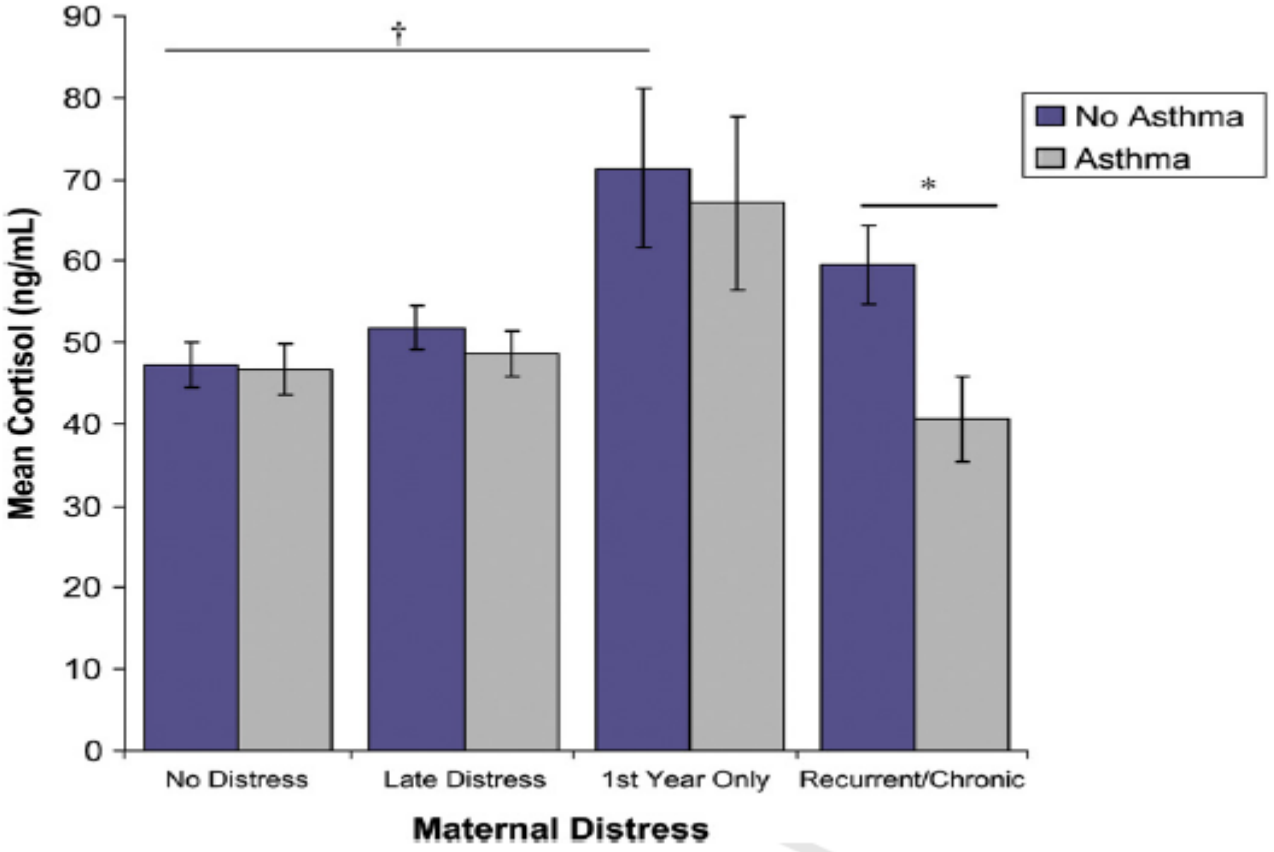

Dreger, Kozyrskyj et al. (2010)
J Allergy Clinc Immunol

Atopic Dermatitis
Our research (in preparation)

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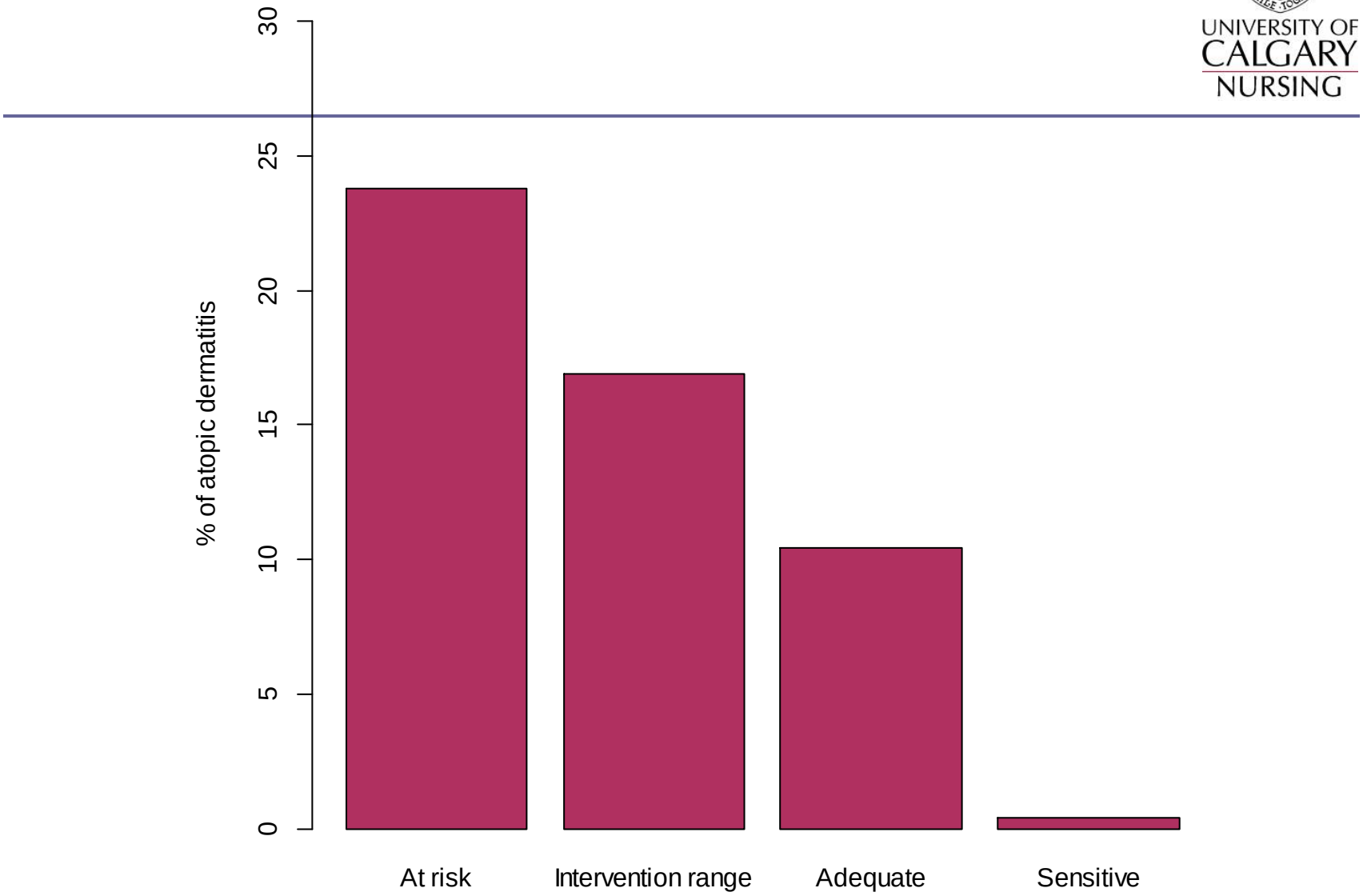
Table 3. Associations with AD including Maternal Sensitivity

	Crude OR (95% CI)	Adjusted OR* (95% CI)	Additional Adjustment
Maternal Sensitivity	0.81 (0.67 – 0.98)	0.74 (0.59 – 0.93)	0.70 (0.55 – 0.91)
Postnatal Depression	0.97 (0.87 – 1.08)	0.93 (0.82 – 1.05)	0.86 (0.74 – 1.00)
Pregnancy Specific Anxiety	1.57 (0.76 – 3.27)	2.02 (0.81 – 5.05)	2.89 (1.09 – 7.66)
Postnatal Anxiety	1.08 (0.98 – 1.18)	1.13 (1.01 – 1.28)	1.16 (1.01 – 1.34)
Maternal Asthma : Yes vs No	3.44 (1.31 – 9.02)	4.35 (1.52 – 12.4)	5.62 (1.73 – 18.2)
Postnatal Social Support	0.98 (0.96 – 1.01)		0.96 (0.93 – 0.99)
Marital status: Married vs Single	0.45 (0.19 – 1.08)		0.47 (0.16 – 1.42)

Fig 1: Atopic Dermatitis by Maternal Sensitivity

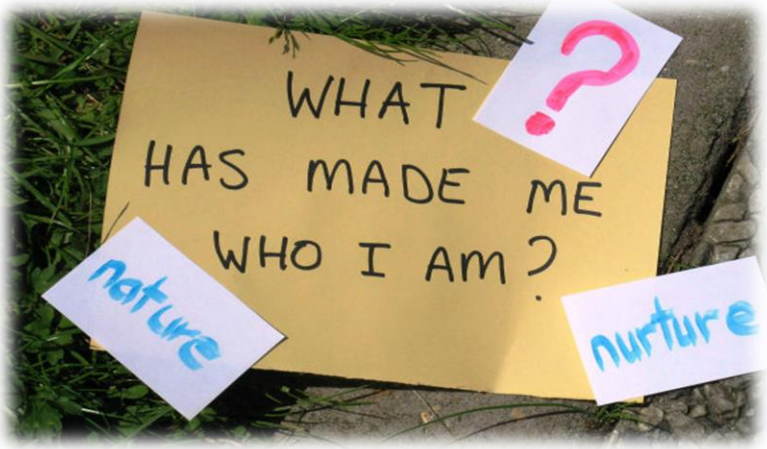


Asthma

- Children with asthma may exhibit a blunted HPA axis response associated with diminished steroid receptor sensitivity subsequent to chronic stress.
- An altered stress response subsequent to maternal distress and associated reduced maternal sensitivity, that originates in the first year of life when the immune system is maturing may play a role in asthma's development.

Health & development: Result of Nature or Nurture?

- **Nature argument:** Human behaviour is the result of our genetic make-up. It is also called innate behaviour.
- **Nurture argument:** Behaviour is the result of learning and experience resulting from outside factors such as
  - the food we eat,
  - the parenting style under which we are reared etc.
    - It is also called learned behaviour.



The question is no longer whether nature trumps nurture or vice versa; rather it is how the two variables interact to produce a unique individual

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The Orchid and the Dandelion

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The Orchid and the Dandelion

- Genetic *Dandelion* children seem to have the capacity to survive—even thrive—in whatever circumstances they encounter; they are psychologically resilient
- Genetic *Orchid* children, in contrast, are highly sensitive to their environment, **especially to the quality of parenting they receive**
- If neglected, orchid children promptly wither—but if they are nurtured, they not only survive but flourish

Herbert 2011, Boyce 2008

List of Proposed Susceptibility Factors that Emerge across studies (Belsky 2009)

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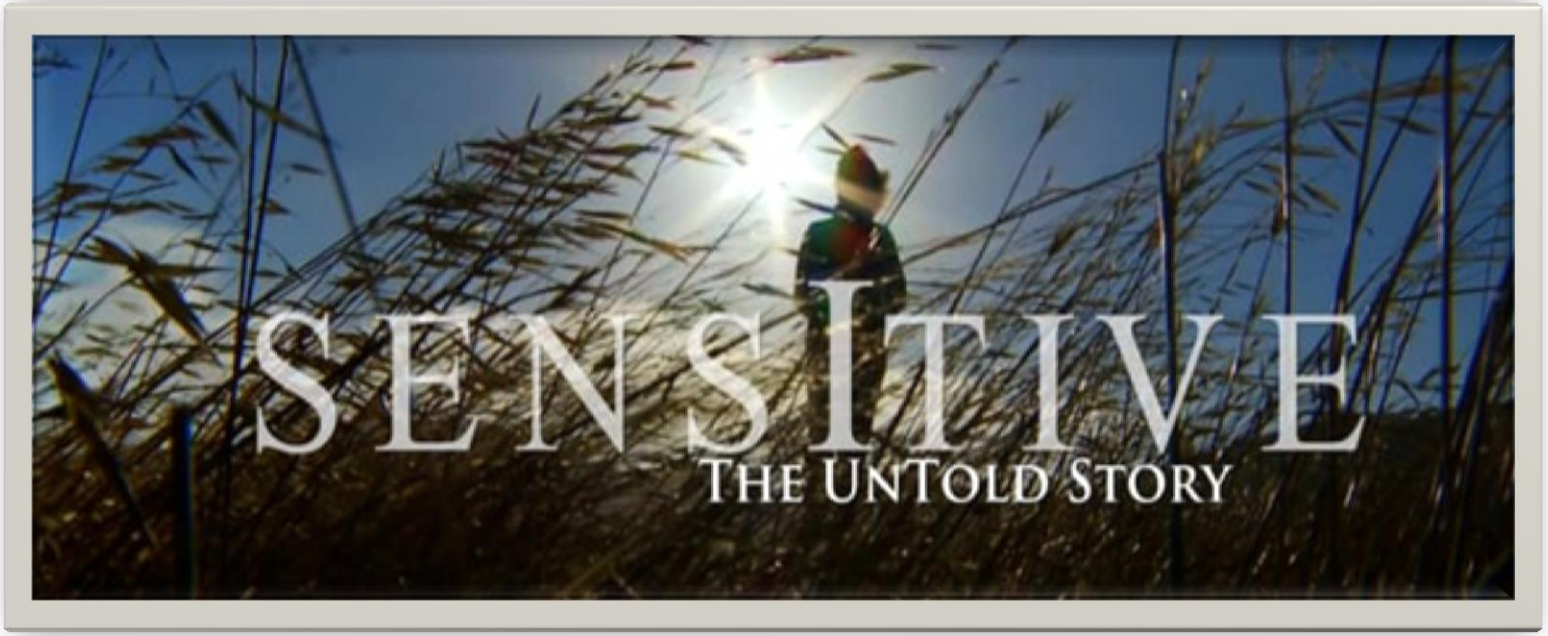

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Genotypic Susceptibility Studies

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Susceptibilty Factor	Outcome	Environment	Exemplary Study
5-HTTLPR (Serotonergic system)	Depressive and anxiety s/s	Stressful life events, childhood adversity/not	Taylor 2006
DRD4 (Dopaminergic system)	Behavior problems	Low/high quality parenting	Barkermans-Kranenburg 2006
DRD2 (Dopaminergic system)	Affective problems	Low/high maternal sensitivity	Mill-Koonce 2007
MAOA (Serotonin, Dopamine, Adrenaline)	Antisocial behaviour	Childhood maltreatment/not	Kim-Cohen 2006
BDNF Val66Met (Brain Development)	Depression	Childhood abuse/not	Kaufman 2006
DAT A1 allele (Dopaminergic system)	Attentional behaviours (e.g. ADHD)	Poor caregiving/not	Bakermans-Kranenburg, 2011, Kranfo 2011

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Cognitive development & DRD4

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- Caregiving affects the cognitive development of children with the 7-repeat allele of DRD4
- Caregiving that has maternal sensitivity, mindfulness, and autonomy–support at 15 months was found to alter children's executive functions at 18 to 20 months
- Higher quality parenting was associated with better effortful control in 4-year-olds with DRD4 7 repeat

Posner et al. (2012)

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Intervention and DRD4

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- Because insensitive and unresponsive caregiving during infancy has been linked to externalizing behavior problems during childhood and adolescence
  - Parents of children who exhibited high levels of externalizing behavior were randomly assigned to an intervention program where professionals guided parents to be sensitively responsive to their infants or to a comparison program
  - Externalizing behavior decreased in the intervention group, **but especially for children that possessed the DRD4 7 repeat allele**

Velderman 2006, Windhorst 2015

Bakermans-Kranenburg 2008

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MAO-A Gene

- 2 or 3 repeat (low activity) version has been associated with a variety of psychiatric disorders, including antisocial behavior, thought to be related to ↓ levels of MAO in the brain, shifting mood by changing serotonin levels
- Low reactivity allele has been linked with aggressive behaviour in response to provocation, but especially when experienced maltreatment in childhood, however…

Caspi 2002, McDermott et al. 2009

MAO-A Gene

- Those with the low reactivity variant also scored the lowest on psychiatric disorders, including antisocial behavior when *not* exposed to childhood maltreatment
- Low rx allele predicts
  - ADHD and mental health problems if children had been victims of abuse, but ↓ problems and ↑ function if they had not
  - conduct disorder including criminality if parents reported childhood adversity (IPV, parental neglect, inconsistency), but ↓ problems and ↑ function if they had not

Foley 2004
McDermott et al. 2009
Nillson 2006

Child Health Intervention and Longitudinal Development

Summary

Mothers and fathers are regulators of their infants' behaviour, mental and physical health via "hidden" influences on endocrine, inflammatory & nervous systems through the parent-child relationship

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4. CULTURAL RELEVANCE TO CANADIANS: INTERPRETING SCORES

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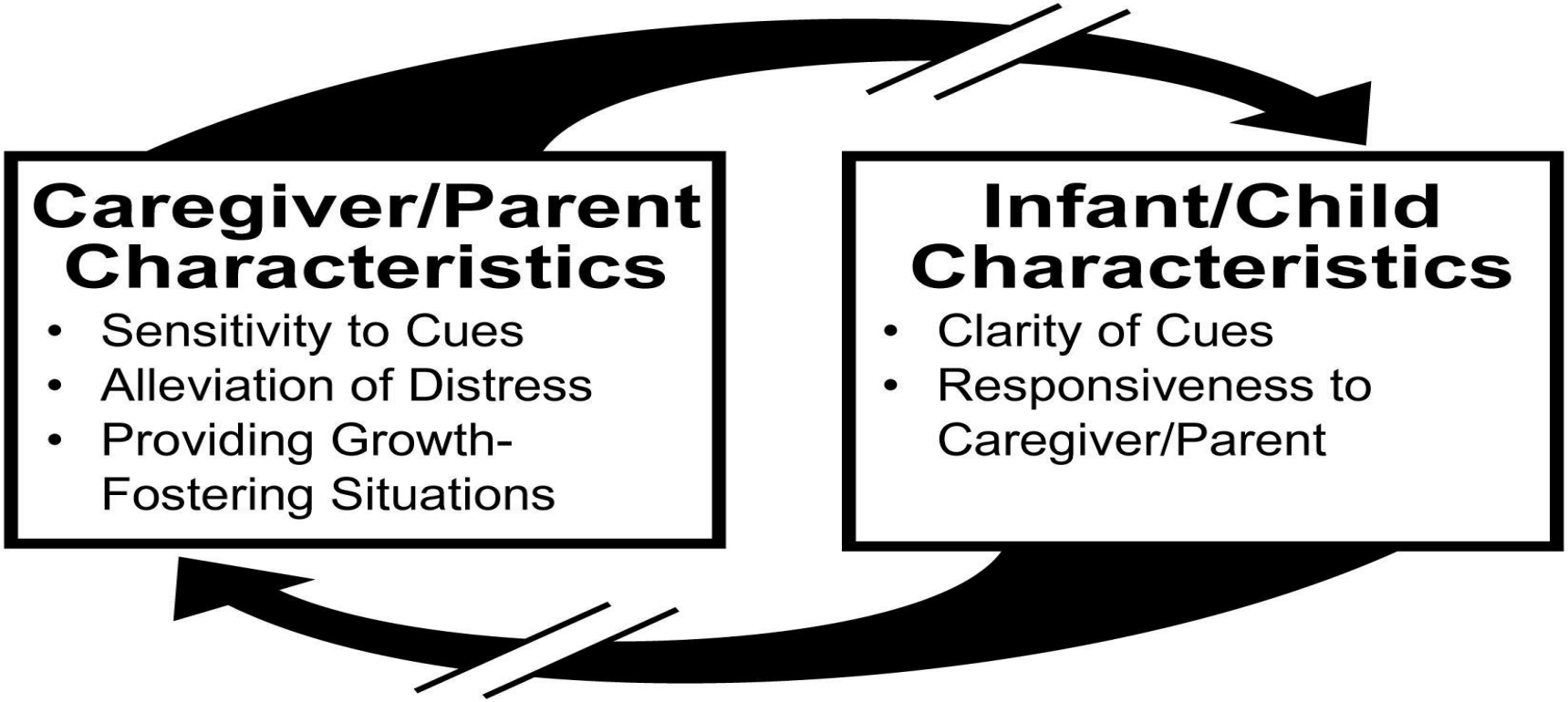
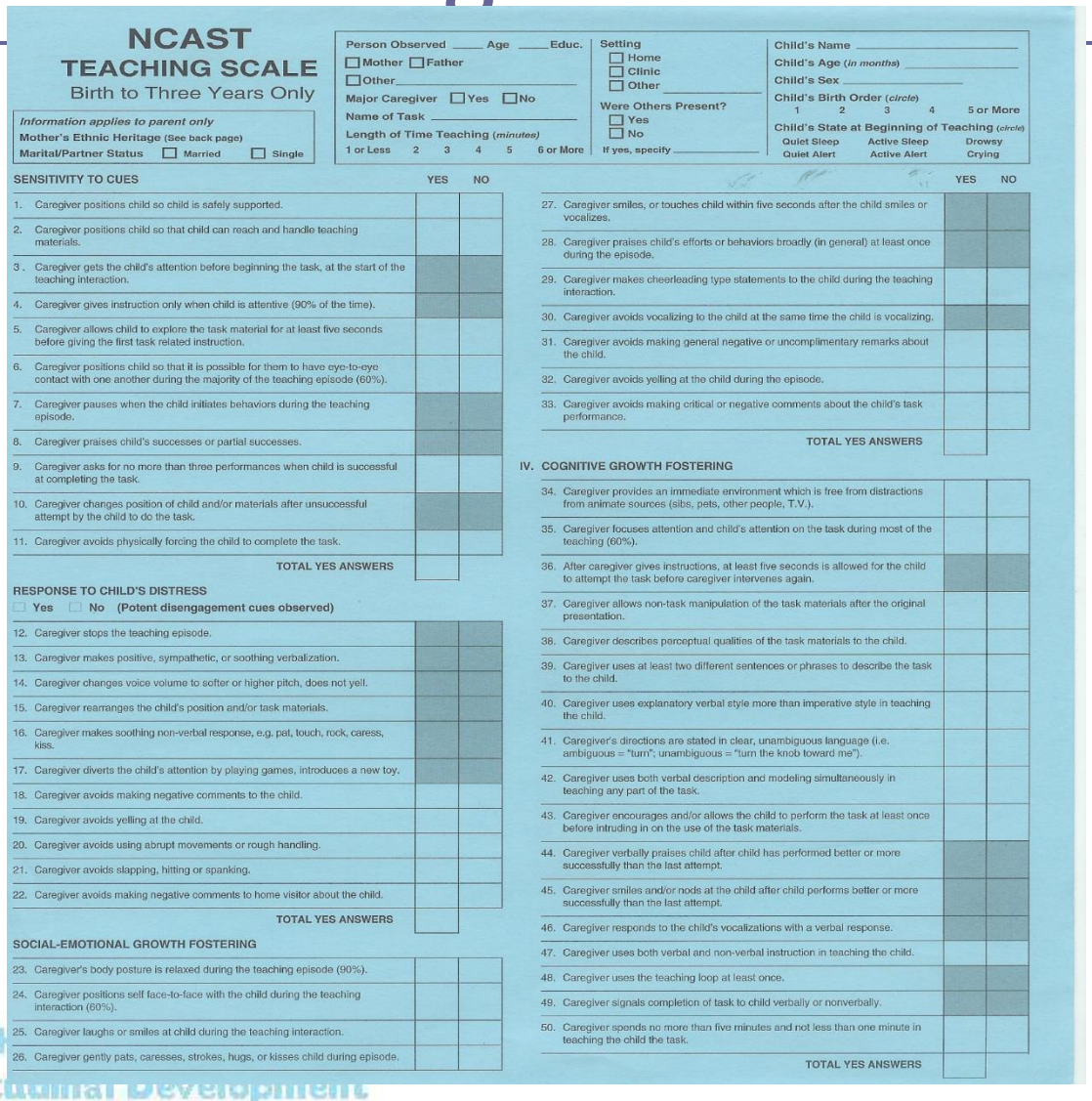
The Barnard Model



NCAST Teaching Scale



NCAST TEACHING SCALE
Birth to Three Years Only

Information applies to parent only
Mother's Ethnic Heritage (See back page)
Marital/Partner Status ☐ Married ☐ Single

Person Observed ____ Age ____ Educ.
☐ Mother ☐ Father
☐ Other ____
Major Caregiver ☐ Yes ☐ No
Name of Task ____
Length of Time Teaching (*minutes*)
1 or Less 2 3 4 5 6 or More

Setting
☐ Home
☐ Clinic
☐ Other ____
Were Others Present?
☐ Yes
☐ No
If yes, specify ____

Child's Name ____
Child's Age (*in months*) ____
Child's Sex ____
Child's Birth Order (*circle*)
1 2 3 4 5 or More
Child's State at Beginning of Teaching (*circle*)
Quiet Sleep Active Sleep Drowsy
Quiet Alert Active Alert Crying

SENSITIVITY TO CUES	YES	NO
1. Caregiver positions child so child is safely supported.		
2. Caregiver positions child so that child can reach and handle teaching materials.		
3. Caregiver gets the child's attention before beginning the task, at the start of the teaching interaction.		
4. Caregiver gives instruction only when child is attentive (90% of the time).		
5. Caregiver allows child to explore the task material for at least five seconds before giving the first task related instruction.		
6. Caregiver positions child so that it is possible for them to have eye-to-eye contact with one another during the majority of the teaching episode (60%).		
7. Caregiver pauses when the child initiates behaviors during the teaching episode.		
8. Caregiver praises child's successes or partial successes.		
9. Caregiver asks for no more than three performances when child is successful at completing the task.		
10. Caregiver changes position of child and/or materials after unsuccessful attempt by the child to do the task.		
11. Caregiver avoids physically forcing the child to complete the task.		
TOTAL YES ANSWERS		

RESPONSE TO CHILD'S DISTRESS ☐ Yes ☐ No (Potent disengagement cues observed)		
12. Caregiver stops the teaching episode.		
13. Caregiver makes positive, sympathetic, or soothing verbalization.		
14. Caregiver changes voice volume to softer or higher pitch, does not yell.		
15. Caregiver rearranges the child's position and/or task materials.		
16. Caregiver makes soothing non-verbal response, e.g. pat, touch, rock, caress, kiss.		
17. Caregiver diverts the child's attention by playing games, introduces a new toy.		
18. Caregiver avoids making negative comments to the child.		
19. Caregiver avoids yelling at the child.		
20. Caregiver avoids using abrupt movements or rough handling.		
21. Caregiver avoids slapping, hitting or spanking.		
22. Caregiver avoids making negative comments to home visitor about the child.		
TOTAL YES ANSWERS		

SOCIAL-EMOTIONAL GROWTH FOSTERING		
23. Caregiver's body posture is relaxed during the teaching episode (90%).		
24. Caregiver positions self face-to-face with the child during the teaching interaction (60%).		
25. Caregiver laughs or smiles at child during the teaching interaction.		
26. Caregiver gently pats, caresses, strokes, hugs, or kisses child during episode.		
27. Caregiver smiles, or touches child within five seconds after the child smiles or vocalizes.		
28. Caregiver praises child's efforts or behaviors broadly (in general) at least once during the episode.		
29. Caregiver makes cheerleading type statements to the child during the teaching interaction.		
30. Caregiver avoids vocalizing to the child at the same time the child is vocalizing.		
31. Caregiver avoids making general negative or uncomplimentary remarks about the child.		
32. Caregiver avoids yelling at the child during the episode.		
33. Caregiver avoids making critical or negative comments about the child's task performance.		
TOTAL YES ANSWERS		

IV. COGNITIVE GROWTH FOSTERING		
34. Caregiver provides an immediate environment which is free from distractions from animate sources (sibs, pets, other people, T.V.).		
35. Caregiver focuses attention and child's attention on the task during most of the teaching (60%).		
36. After caregiver gives instructions, at least five seconds is allowed for the child to attempt the task before caregiver intervenes again.		
37. Caregiver allows non-task manipulation of the task materials after the original presentation.		
38. Caregiver describes perceptual qualities of the task materials to the child.		
39. Caregiver uses at least two different sentences or phrases to describe the task to the child.		
40. Caregiver uses explanatory verbal style more than imperative style in teaching the child.		
41. Caregiver's directions are stated in clear, unambiguous language (i.e. ambiguous = "turn"; unambiguous = "turn the knob toward me").		
42. Caregiver uses both verbal description and modeling simultaneously in teaching any part of the task.		
43. Caregiver encourages and/or allows the child to perform the task at least once before intruding in on the use of the task materials.		
44. Caregiver verbally praises child after child has performed better or more successfully than the last attempt.		
45. Caregiver smiles and/or nods at the child after child performs better or more successfully than the last attempt.		
46. Caregiver responds to the child's vocalizations with a verbal response.		
47. Caregiver uses both verbal and non-verbal instruction in teaching the child.		
48. Caregiver uses the teaching loop at least once.		
49. Caregiver signals completion of task to child verbally or nonverbally.		
50. Caregiver spends no more than five minutes and not less than one minute in teaching the child the task.		
TOTAL YES ANSWERS		

Child H
Longitudinal Development

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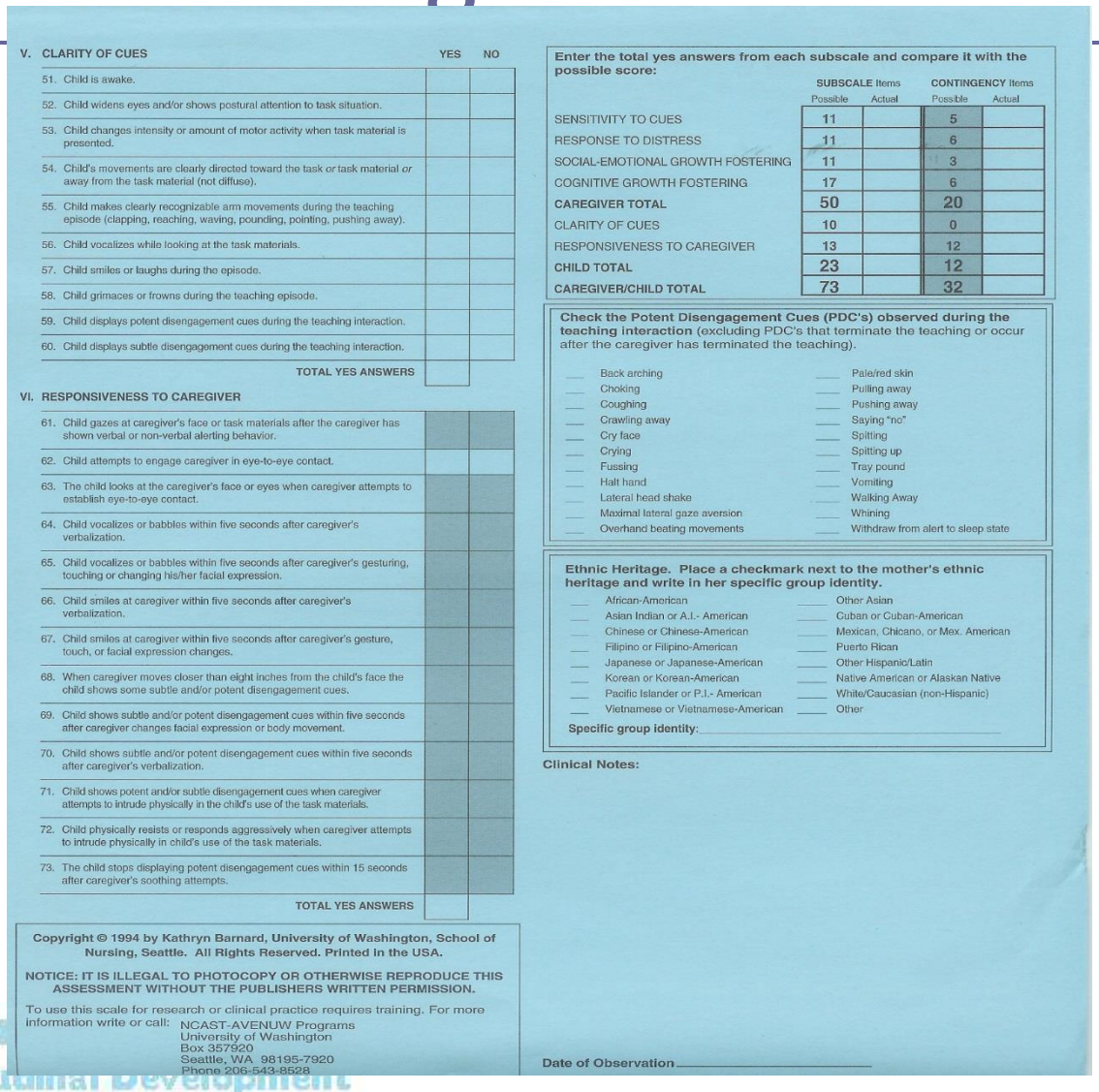
NCAST Teaching Scale



V. CLARITY OF CUES	YES	NO
51. Child is awake.		
52. Child widens eyes and/or shows postural attention to task situation.		
53. Child changes intensity or amount of motor activity when task material is presented.		
54. Child's movements are clearly directed toward the task or task material or away from the task material (not diffuse).		
55. Child makes clearly recognizable arm movements during the teaching episode (clapping, reaching, waving, pounding, pointing, pushing away).		
56. Child vocalizes while looking at the task materials.		
57. Child smiles or laughs during the episode.		
58. Child grimaces or frowns during the teaching episode.		
59. Child displays potent disengagement cues during the teaching interaction.		
60. Child displays subtle disengagement cues during the teaching interaction.		
TOTAL YES ANSWERS		

VI. RESPONSIVENESS TO CAREGIVER		
61. Child gazes at caregiver's face or task materials after the caregiver has shown verbal or non-verbal alerting behavior.		
62. Child attempts to engage caregiver in eye-to-eye contact.		
63. The child looks at the caregiver's face or eyes when caregiver attempts to establish eye-to-eye contact.		
64. Child vocalizes or babbles within five seconds after caregiver's verbalization.		
65. Child vocalizes or babbles within five seconds after caregiver's gesturing, touching or changing his/her facial expression.		
66. Child smiles at caregiver within five seconds after caregiver's verbalization.		
67. Child smiles at caregiver within five seconds after caregiver's gesture, touch, or facial expression changes.		
68. When caregiver moves closer than eight inches from the child's face the child shows some subtle and/or potent disengagement cues.		
69. Child shows subtle and/or potent disengagement cues within five seconds after caregiver changes facial expression or body movement.		
70. Child shows subtle and/or potent disengagement cues within five seconds after caregiver's verbalization.		
71. Child shows potent and/or subtle disengagement cues when caregiver attempts to intrude physically in the child's use of the task materials.		
72. Child physically resists or responds aggressively when caregiver attempts to intrude physically in child's use of the task materials.		
73. The child stops displaying potent disengagement cues within 15 seconds after caregiver's soothing attempts.		
TOTAL YES ANSWERS		

To use this scale for research or clinical practice requires training. For more information write or call:

NCAST-AVENUW Programs
University of Washington
Box 357920
Seattle, WA 98195-7920
Phone 206-543-8528

Enter the total yes answers from each subscale and compare it with the possible score:

	SUBSCALE Items Possible	SUBSCALE Items Actual	CONTINGENCY Items Possible	CONTINGENCY Items Actual
SENSITIVITY TO CUES	11		5	
RESPONSE TO DISTRESS	11		6	
SOCIAL-EMOTIONAL GROWTH FOSTERING	11		3	
COGNITIVE GROWTH FOSTERING	17		6	
CAREGIVER TOTAL	50		20	
CLARITY OF CUES	10		0	
RESPONSIVENESS TO CAREGIVER	13		12	
CHILD TOTAL	23		12	
CAREGIVER/CHILD TOTAL	73		32	

Check the Potent Disengagement Cues (PDC's) observed during the teaching interaction (excluding PDC's that terminate the teaching or occur after the caregiver has terminated the teaching).

___ Back arching	___ Pale/red skin
___ Choking	___ Pulling away
___ Coughing	___ Pushing away
___ Crawling away	___ Saying "no"
___ Cry face	___ Spitting
___ Crying	___ Spitting up
___ Fussing	___ Tray pound
___ Halt hand	___ Vomiting
___ Lateral head shake	___ Walking Away
___ Maximal lateral gaze aversion	___ Whining
___ Overhand beating movements	___ Withdraw from alert to sleep state

Ethnic Heritage. Place a checkmark next to the mother's ethnic heritage and write in her specific group identity.

___ African-American	___ Other Asian
___ Asian Indian or A.I.- American	___ Cuban or Cuban-American
___ Chinese or Chinese-American	___ Mexican, Chicano, or Mex. American
___ Filipino or Filipino-American	___ Puerto Rican
___ Japanese or Japanese-American	___ Other Hispanic/Latin
___ Korean or Korean-American	___ Native American or Alaskan Native
___ Pacific Islander or P.I.- American	___ White/Caucasian (non-Hispanic)
___ Vietnamese or Vietnamese-American	___ Other

Specific group identity: _____

Clinical Notes:

Date of Observation _____

Child H
Longitudinal Development

NCAST Feeding Scale

UNIVERSITY OF CALGARY NURSING

NCAST FEEDING SCALE

Birth to One Year Only

Information applies to parent only

Mother's Ethnic Heritage (See back page)

Marital/Partner Status ☐ Married ☐ Single

Person Observed ____ Age ____ Educ.
☐ Mother ☐ Father
☐ Other ____
Major Caregiver ☐ Yes ☐ No
Type of Feeding ☐ Breast ☐ Bottle ☐ Solid
Usual Feeding Time ☐ Yes ☐ No
Length of Time Feeding *(circle minutes)*
10 or Less 11-19 20-29 30 or more

Setting
☐ Home
☐ Clinic
☐ Other____
Were Others Present?
☐ Yes
☐ No
If yes, specify____

Child's Name ____
Child's Age *(in months)* ____
Child's Sex ____
Child's Birth Order *(circle)*
1 2 3 4 5 or More
Child's State at Beginning of Feeding *(circle)*
Quiet Sleep Active Sleep Drowsy
Quiet Alert Active Alert Crying

SENSITIVITY TO CUES	YES	NO
1. Caregiver positions child so that child is safe but can move his/her arms .		
2. Caregiver positions child so that the child's head is higher than hips.		
3. Caregiver positions child so that trunk-to-trunk contact is maintained during more than half of the breast or bottle feeding (50%).		
4. Caregiver positions child so that eye-to-eye contact is possible.		
5. Caregiver's face is at least 7-8 inches or more from the child's face during feeding except when kissing, caressing, hugging, or burping the child.		
6. Caregiver smiles, verbalizes, or makes eye contact with child when child is in open-face-gaze position.		
7. Caregiver comments verbally on child's hunger cues prior to feeding.		
8. Caregiver comments verbally on child's satiation cues before terminating feeding.		
9. Caregiver varies the intensity of verbal stimulation during feeding.		
10. Caregiver varies intensity of rocking or moving the child during the feeding.		
11. Caregiver varies the intensity or form of touch during the feeding.		
12. Caregiver allows pauses in feeding when the child shows potent disengagement cues or is in the pause phase of the suck-pause sequence of sucking.		
13. Caregiver slows the pace of feeding or pauses when child shows subtle disengagement cues.		
14. Caregiver terminates the feeding when the child shows satiation cues or after other methods have proved unsuccessful.		
15. Caregiver allows child to suck and/or chew without interruption.		
16. Caregiver only offers food when the child is attending.		
TOTAL YES ANSWERS		

I. RESPONSE TO CHILD'S DISTRESS ☐ Yes ☐ No (Potent Disengagement Cues Observed)		
17. Caregiver stops or starts feeding.		
18. Caregiver changes the child's position.		
19. Caregiver makes positive or sympathetic verbalization.		
20. Caregiver changes voice volume to softer or higher pitch.		
21. Caregiver makes soothing non-verbal efforts.		
22. Caregiver diverts child's attention by playing games, introducing toy, or making faces.		
23. Caregiver avoids making negative verbal responses.		
24. Caregiver avoids making negative comments to home visitor about child.		
25. Caregiver avoids yelling at child.		
26. Caregiver avoids using abrupt movements or rough handling.		
27. Caregiver avoids slapping, hitting, or spanking the child.		
TOTAL YES ANSWERS		

III. SOCIAL-EMOTIONAL GROWTH FOSTERING	YES	NO
28. Caregiver pays more attention to child during feeding than to other people or things in the environment.		
29. Caregiver is in "en face" position for more than half of the feeding.		
30. Caregiver succeeds in making eye contact with child once during feeding.		
31. Caregiver's facial expression changes at least twice during feeding .		
32. Caregiver engages in social forms of interaction (plays games with child) at least once during the feeding.		
33. Caregiver uses positive statements in talking to child during the feeding.		
34. Caregiver praises child or some quality of the child's behavior during the feeding.		
35. Caregiver hums, croons, sings or changes the pitch of his/her voice during the feeding.		
36. Caregiver laughs or smiles during the feeding.		
37. Caregiver uses gentle forms of touching during the feeding.		
38. Caregiver smiles, verbalizes or touches child within five seconds of child smiling or vocalizing at caregiver.		
39. Caregiver avoids compressing lips, grimacing, or frowning when making eye contact with child.		
40. Caregiver avoids slapping, hitting, shaking, or grabbing the child or child's extremities during the feeding.		
41. Caregiver avoids making negative comments or uncomplimentary remarks to the child or home visitor about the child or child's behavior.		
TOTAL YES ANSWERS		

IV. COGNITIVE GROWTH FOSTERING		
42. Caregiver provides child with objects, finger foods, toys, and/or utensils.		
43. Caregiver encourages and/or allows the child to explore the breast, bottle, food, cup, bowl, utensils, or the caregiver during feeding.		
44. Caregiver talks to the child using two words at least three times during the feeding.		
45. Caregiver verbally describes food or feeding situation to child during feeding.		
46. Caregiver talks to child about things other than food, eating, or things related to feeding.		
47. Caregiver uses statements that describe, ask questions or explains consequences of behavior, more than commands, in talking to child.		
48. Caregiver verbally responds to child's sound within five seconds after child has vocalized.		
49. Caregiver verbally responds to child's movement within five seconds of child's movement of arms, legs, hands, head, trunk.		
50. Caregiver avoids using baby talk.		
TOTAL YES ANSWERS		

V. CLARITY OF CUES	YES	NO
51. Child signals readiness to eat.		
52. Child displays a build-up of tension at the beginning of feeding.		
53. Child demonstrates a decrease in tension within a few minutes after feeding has begun.		
54. Child has periods of alertness during the feeding.		
55. Child displays at least two different emotions during the feeding.		
56. Child has periods of activity and inactivity during the feeding.		
57. Child's movements are smooth and coordinated during the feeding.		
58. Child's arm and leg movements are generally directed toward caregiver during feeding (not diffuse).		
59. Child initiates contact with caregiver's face or eyes at least once during feeding.		
60. Child vocalizes during feeding.		
61. Child smiles or laughs during feeding.		
62. Child averts gaze, looks down or turns away during feeding.		
63. Child actively resists food offered.		
64. Child demonstrates satiation at end of feeding.		
65. Child has less than three rapid state changes during feeding.		
TOTAL YES ANSWERS		

VI. RESPONSIVENESS TO CAREGIVER		
66. Child responds to feeding attempts by caregiver most of the time.		
67. Child responds to games, social play or social cues of caregiver during feeding.		
68. Child looks in the direction of the caregiver's face after caregiver has attempted to alert the child verbally or non-verbally during feeding.		
69. Child vocalizes to caregiver during feeding.		
70. Child vocalizes or smiles within five seconds of caregiver's vocalization.		
71. Child smiles at caregiver during feeding.		
72. Child explores caregiver or reaches out to touch caregiver during feeding.		
73. Child shows a change in level of motor activity within five seconds of being handled or repositioned by caregiver.		
74. Child shows potent disengagement cues during last half of feeding.		
75. Child shows potent disengagement cues within five seconds after caregiver moves closer than 7 to 8 inches from child's face.		
76. Child avoids turning away from caregiver, or averting gaze during first half of feeding.		
TOTAL YES ANSWERS		

Enter the total yes answers from each subscale and compare it with the possible score:

	SUBSCALE Items Possible	SUBSCALE Items Actual	CONTINGENCY Items Possible	CONTINGENCY Items Actual
SENSITIVITY TO CUES	16		6	
RESPONSE TO DISTRESS	11		6	
SOCIAL-EMOTIONAL GROWTH FOSTERING	14		1	
COGNITIVE GROWTH FOSTERING	9		2	
CAREGIVER TOTAL	50		15	
CLARITY OF CUES	15		0	
RESPONSIVENESS TO CAREGIVER	11		3	
INFANT TOTAL	26		3	
CAREGIVER/INFANT TOTAL	76		18	

Check the Potent Disengagement Cues (PDC's) observed during the feeding interaction (excluding initial tension up to a minute into the feeding and any PDC's that terminate the feeding).

___ Back arching	___ Pale/red skin
___ Choking	___ Pulling away
___ Coughing	___ Pushing away
___ Crawling away	___ Saying "no"
___ Cry face	___ Spitting
___ Crying	___ Spitting up
___ Fussing	___ Tray pound
___ Halt hand	___ Vomiting
___ Lateral head shake	___ Walking Away
___ Maximal lateral gaze aversion	___ Whining
___ Overhand beating movements	___ Withdraw from alert to sleep state

Ethnic Heritage. Place a checkmark next to the mother's ethnic heritage and write in her specific group identity.

___ African-American	___ Other Asian
___ Asian Indian or A.I.- American	___ Cuban or Cuban-American
___ Chinese or Chinese-American	___ Mexican, Chicano, or Mex. American
___ Filipino or Filipino-American	___ Puerto Rican
___ Japanese or Japanese-American	___ Other Hispanic/Latin
___ Korean or Korean-American	___ Native American or Alaskan Native
___ Pacific Islander or P.I.- American	___ White/Caucasian (non-Hispanic)
___ Vietnamese or Vietnamese-American	___ Other

Specific group identity:____

Clinical Notes:

NCAST-AVENUW Programs
University of Washington
Box 357920
Seattle, WA 98195-7920
Phone 206-543-8528
www.ncast.org

Date of Observation____

Child Health Intervention and Longitudinal Development

Comparing Canadian Normative Sample with NCAST Population Mean:

Test for significant difference between high school and more than high school are 2-tailed t-test (non significant)

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Variables	High school or less		More than High School	
	FP Mean (NCAST Mean)	SD	FP Mean (NCAST Mean)	SD
Mother				
Sensitivity to Cues	9.00 (8.48)	1.22	8.96 (9.16)	1.06
Response to child's distress	9.94 (9.92)	0.83	9.90 (10.0)	0.06
Social-Emotional Growth Fostering	7.58 (8.49)	2.12	7.00 (8.99)	1.90
Cognitive Growth Fostering	10.9 (10.5)	3.69	11.0 (12.5)	2.65
Mother Total Score	37.4 (37.4)	6.35	36.9 (40.7)	4.93
Child				
Clarity of Cues	8.94 (7.98)	1.24	8.65 (7.99)	1.08
Responsiveness to Mother	8.35 (6.90)	2.78	7.35 (7.45)	2.41
Child Total score	17.3 (14.9)	3.88	16.0 (15.4)	3.32
Total Teaching Score	54.70 (52.3)	9.95	52.9 (56.1)	7.42
Contingency Scores				
Mother Contingency	13.88 (14.3)	3.17	13.35 (16.1)	2.77
Child Contingency	7.70 (6.27)	2.36	6.82 (6.76)	2.11

Violence and Victims, Volume 28, Number 4, 2013

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Mothers and Infants Exposed to Intimate Partner Violence Compensate

Nicole Letourneau, RN, BN, MN, PhD
University of Calgary

Catherine Young Morris, MA, BA
Loretta Secco, RN, BScN, MN, PhD
University of New Brunswick

Miriam Stewart, BScN, MN, PhD
University of Alberta

Jean Hughes, BN, MSc, PhD
Dalhousie University

Kim Critchley, BScN, MN, PhD
University of Prince Edward Island

Reasons for the developmental variability in children exposed to intimate partner violence (IPV) are unclear and under studied. This article presents exploratory findings on (a) the potential impact of IPV on mother–child relationships and child development and (b) the association between these maternal–child relationship impacts and child development. The fit of findings with compensatory, spillover, and compartmentalization hypotheses was explored. Participants were 49 mothers and 51 children younger than 3 years of age affected by IPV. Data were collected on maternal–child interactions, child development, social support, difficult life circumstances, family functioning, child temperament, and parental depression. The findings suggested developmental impacts on children in the sample, along with children's high sensitivity and responsiveness to their caregivers. Although some spillover effects were observed, the predominant observation was of mothers and infants compensating for exposure to IPV in their interactions.

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TABLE 4. T-Tests: Low Education Adults (<Grade 12)

NCATS	Study Sample (n = 44): Mean	Study Sample (n = 44): *SD*	Normative Database[a] (n = 160): Mean	T-Stat	*p* Value
Sensitivity to cues	9.59	1.13	8.56	6.07	.00
Response to distress	8.91	1.67	9.96	−4.18	.00
Social emotional growth	7.86	1.23	8.27	−2.19	.03
Cognitive growth	13.31	2.23	10.95	7.03	.00
Caregiver total	39.65	3.45	37.74	3.68	.00
Clarity of cues	8.64	1.08	7.85	4.83	.00
Responsiveness to caregiver	9.09	2.14	6.68	7.42	.00
Child total	17.73	2.99	14.53	7.09	.00
Caregiver/child total	57.38	4.85	52.26	7.00	.00
Mother contingency	14.93	2.14	14.73	0.63	.53
Child contingency	8.27	1.93	6.08	7.52	.00

[a]NCATS normative database of low education adults.

Original Article

Low-income Canadian Aboriginal and non-Aboriginal parent–child interactions

N. L. Letourneau,* K. M. Hungler† and K. Fisher‡

*Canadian Research Institute for Social Policy, University of New Brunswick, Fredericton, New Brunswick
†Social Support Research Program, 5-22 A University Extension Centre, University of Alberta, Edmonton, and
‡Faculty of Nursing, 3rd Floor Clinical Sciences Building, Edmonton, AB, Canada

Accepted for publication 3 June 2005

Abstract

Background Limited research is available on the performance of North American Aboriginal[1] people on the Nursing Child Assessment Teaching Scales (NCATS) and available research examines parent–child interactions within Aboriginal samples drawn from the USA. Most published normative data on low-income people's performance on the NCATS are also limited to samples drawn from the USA. The purpose of this research study was to use the NCATS measure to: (1) begin to develop a knowledge base that describes the parent–child interactions observed in Canadian low-income samples; and (2) explore the relationship between parent–infant interactions and ethnicity (Aboriginal or Non-Aboriginal) within a low-income Canadian sample.

Methods Secondary analysis was completed on data collected as part of a larger study designed to examine the impact of low-income situations on pre-school children's health and development in Edmonton, Alberta, Canada. The NCATS measure of parent–child interaction was administered to all children (1–36 months old) and their parents in the low-income non-probability sample. The sample derived for secondary analysis consists of 12 Aboriginal parent–child pairs (11 mothers and 1 father) and 48 Non-Aboriginal parent–child pairs (47 mothers and 1 father).

Results The data analysis suggests that although low-income Aboriginal parents may be less verbal with their children in interactions, the overall interaction quality is not different from that of other low-income parents. However, both groups' parent–child interaction scores were less than the published 10th percentile cut-off score, indicating 'worrisome scores' and less than optimal interactions.

Conclusion While the findings that compare the Aboriginal and Non-Aboriginal samples are limited by the small sample size, the fact that these findings agree with those from heterogeneous Aboriginal samples drawn from the USA are encouraging. Finally, the findings provide needed information about parent–child interactions in Canadian low-income urban samples including data from Aboriginal parents and children.

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LowEd Adults from NCAST

Table 2. Group Statistics

	NCATS norms* M (SD)		Aboriginal M (SD)	Non-Aboriginal M (SD)	P†
Sensitivity to cues	9.72 (1.30)	8.56	7.67 (1.50)	8.06 (1.25)	0.348
Response to distress	10.3 (1.53)	8.96	8.67 (1.83)	8.48 (1.85)	0.754
Social-emotional growth fostering	9.56 (1.37)	8.27	7.75 (3.47)	6.96 (1.56)	0.455
Cognitive growth fostering	13.82 (2.64)	11.0	8.42 (2.54)	10.5 (2.81)	0.026
Parent total	43.4 (5.09)	37.7	32.5 (4.82)	34.0 (5.11)	0.375
Clarity of cues	8.20 (1.34)	7.85	8.92 (1.31)	9.10 (1.06)	0.603
Responsiveness to parent	7.95 (2.88)	6.68	8.25 (2.42)	9.02 (1.97)	0.252
Child total	16.2 (3.84)	14.5	17.2 (3.54)	18.1 (2.84)	0.324
Contingency caregiver	17.4 (2.90)		10.5 (2.65)	12.0 (3.14)	0.144
Contingency child	7.21 (2.68)		7.58 (2.11)	8.17 (1.96)	0.367
Total	59.56 (6.95)	52.3	49.7 (6.98)	52.1 (6.13)	0.240

*For Caucasians $n = 963$.

†For difference between study samples.

Table 3. Chi-square Crosstabulation

Item	Description	Chi-square value	P-value
39	Caregiver uses at least two different sentences or phrases to describe the task to the child	4.298	0.038
45	Caregiver smiles and/or nods at the child after child performs better or more successfully than the last attempt	3.774	0.052
48	Caregiver uses the teaching loop at least once	4.401	0.036

Child Health Intervention and Longitudinal Development

Similarities

Teaching Scale	US Mean Ranges	CDN Mean Ranges
Parent Total	37-41	33-40
Child Total	14.5-15.4	16-18
Total	52-56	53-57

10th percentile cut-offs

Teaching Scale	1-12 months	13-36 months
Parent Total	34	39
Child Total	10	12
Total	47	54

Summary

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- We have Canadian data on Aboriginal parents, low-income parents, families affected by violence
- New data on normative community sample
- Forthcoming data on depressed Canadian women
- US 10th percentile cut-offs for Caucasians are sufficient to use as bench mark of degree of risk
- Nonetheless, NCAST scores are helpful, regardless of cut-offs as they inform intervention

Child Health Intervention and Longitudinal Development

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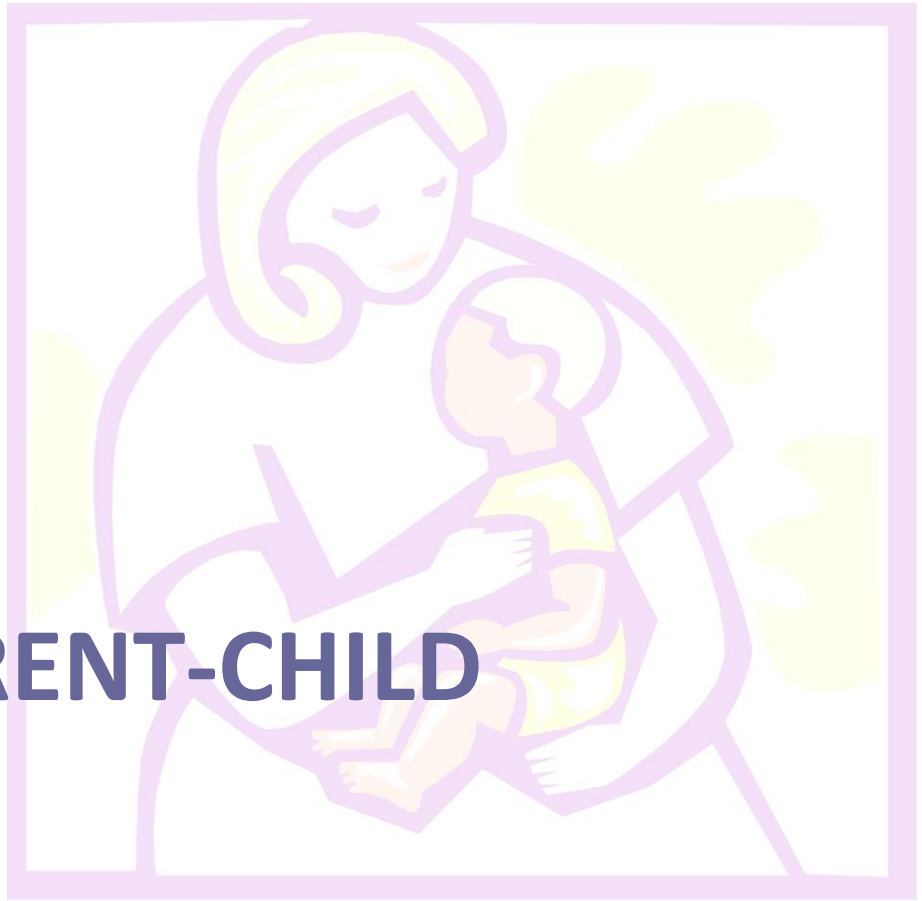

5. SCORING PARENT-CHILD INTERACTIONS

ELSEVIER

Journal

Interventions wit
Modif

Vivienne Jung [a], Robe

[b] Un

Received 30 May 2

Abstract

Background: Postpartum depression (PPD) h
developmental problems. Interventions dire
observed face-to-face interactions between r
parents to understand and respond to infant b
study, KTC was used with mothers suffering
Methods: PPD was confirmed by scores on
dyads completed the study. KTC was carri
videotaped prior to and after KTC, using the
and the effects of the Still-Face perturbation
Results: After intervention, infants displayed
even though mothers' depression ratings did
Limitations: This pilot study is limited by l
Conclusions: This study suggests that interv
effective in increasing infants' positive res
component of treatment when mothers prese

Keywords: Postpartum depression; Mother–infan

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JOURNAL OF AFFECTIVE

Improving Adolescer
A Pilot Study

Nicole Letourneau, PhD, MN

The study objective was to pilot test Keys to C
responsiveness between adolescent mothers and
either the Keys to Caregiving program delivered by
Parent-Infant Interactions and contingent responsiv
assessed when infants completed the program. Th
method of improving adolescent mothers' interacti

SENSITIVE AND RESPONSIVE parent
challenge for any parent; for the still
oping adolescent it may be even more so
pared with older mothers, adolescent m
interactions with their infants have been cha
ized as being less sensitive to infant cues
unrealistic about expectations of infant be
less verbal and responsive toward their
more impatient, and more prone to use p
punishment (Barnard, 1997; Coley & Chas
dale, 1998; Ruff, 1987; von Windeguth & U
1989). These behaviors place the children
lescents at risk for less than optimal devel
(Maynard, 1997; Wakschlag & Hans, 19
contrast, children reared in environments
terized by high-quality, parent-infant inter
are likely to demonstrate successful develop
outcomes such as readiness for school,
skills, peer competence, and cognitive
(Sumner & Spietz, 1995a; Werner & Smith
for a review see Letourneau, 1997).

High-quality, parent-infant interactions a
acterized by mutual warmth, sensitivity,
sponsiveness (Barnard et al., 1989). For hig
ity interactions, infants must send clear cue
their needs and wants whereas parents n
sensitive and able to respond to infants'
When these social interactions are mutual, t
referred to as being *contingently responsi*
behavior of one evokes the appropriate resp
the other. An example of a contingently resp

Research in Nursing & Health, 2008, 31, 12–22

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Effectiveness of Teaching an Early Parenting Approach Within a Community-Based Support Service for Adolescent Mothers

Jane E. Drummond,[1]* Nicole Letourneau,[2†] Susan M. Neufeld,[1,3‡#] Miriam Stewart,[1,4]* Angela Weir[5§]

[1]Faculty of Nursing, University of Alberta, Edmonton, Alberta, Canada
[2]Faculty of Nursing, University of New Brunswick, New Brunswick, Canada
[3]Department of Pediatrics, Faculty of Medicine, University of Alberta, Edmonton, Alberta, Canada
[4]Department of Public Health Sciences, Faculty of Medicine, University of Alberta, Edmonton, Alberta, Canada
[5]Glenrose Rehabilitation Hospital, Alberta, Canada

Accepted 20 July 2007

Abstract: A single blind, pre-test, post-test design was used to test the effectiveness of the Keys to Caregiving Program in enhancing adolescent mother–infant interactions. Participants were sequentially allocated to groups in order of referral. The outcome was the enhancement of maternal and infant behaviors that exhibited mutual responsiveness as measured by the Nursing Child Assessment Teaching Scale. Issues with recruitment and collaboration with the community agencies made achieving a desirable sample size difficult. Pre-tests and post-tests were completed for 13 participants. While the sample size was insufficient to confidently establish whether or not the Keys to Caregiving produced a between groups treatment effect, mothers within the treatment group evidenced significantly greater contingent responsiveness over time than those within the control group. © 2007 Wiley Periodicals, Inc. Res Nurs Health 31:12–22, 2008

Keywords: adolescence; developmental stages; parent–child relationships; parent–infant health/parenting

NCAST Interaction Intervention

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- Interventionist teaches parents concepts relevant to NCAST
- Interventionist observes parent in NCAST Teaching or Feeding Interaction
- Interventionist provides feedback using video or in-person observation, focusing on strengths and one or two areas for improvement.
- Parent asked to redo Teaching or Feeding Interaction after feedback/instruction
- Post-test examinations reveal improvement. (e.g. Koniak-Griffin; Jung & Letourneau; Letourneau; Tryphonopoulos VID-KIDS)

Child Health Intervention and Longitudinal Development

Jung & Letourneau

Direct group instruction given to mothers with PPD in the interpretation of infant behaviours and cues

Methods

- NCAST concepts taught in 5 weekly sessions, beginning at infant age 3 mos.
- Dyads videotaped prior to and after intervention using split-screen photography
- Mothers taught to use Tronnick's Face-to-Face Still-Face paradigm
- Videotapes scored for infant facial expressions (Interest, Joy, Sadness, Anger)

Split Screen Photography

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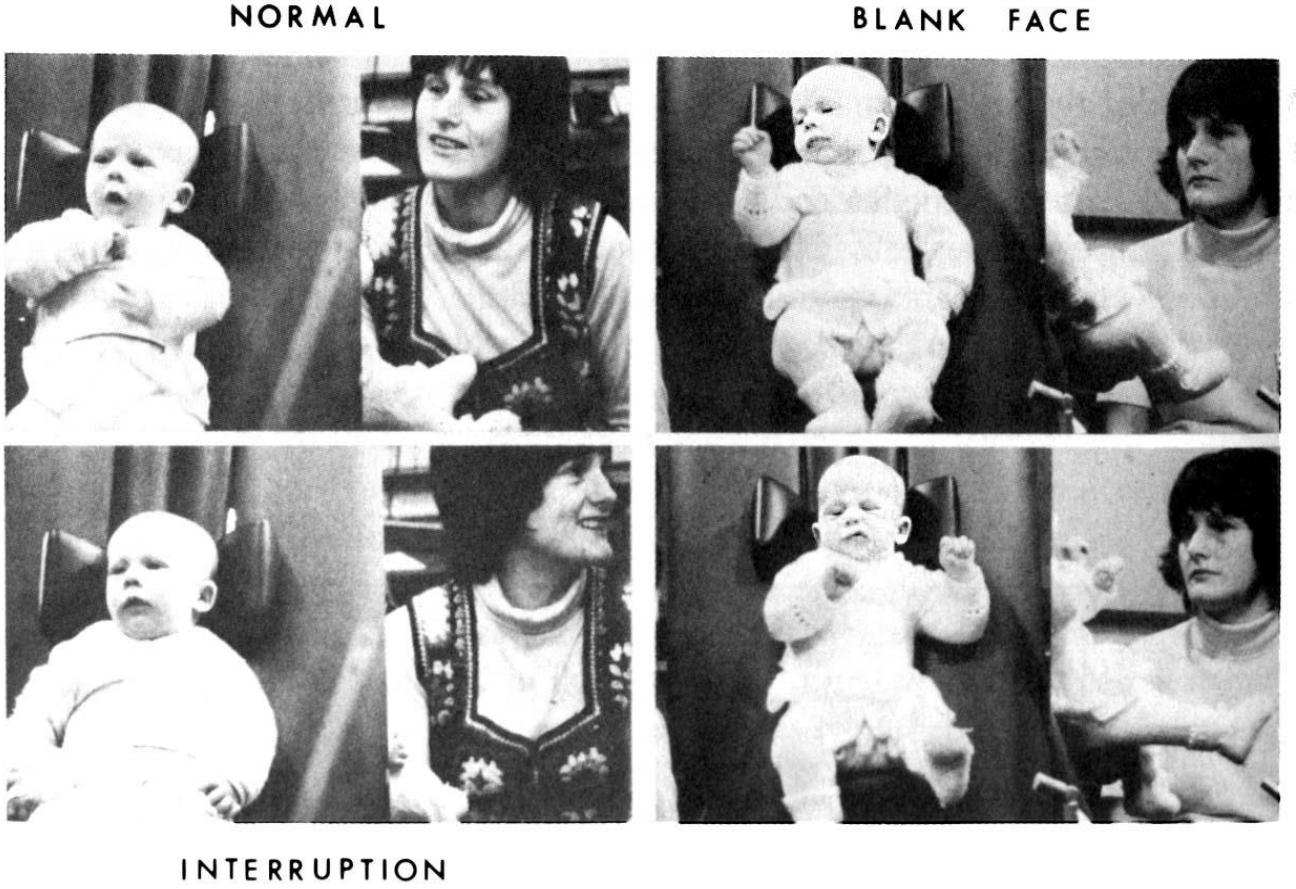

Figure 1. Stills from cine films of Experiment 1 showing typical infant reactions in the three conditions.

Results

After intervention, infants displayed a marked increase in facial emotion expressions of Joy and Interest when interacting face-to-face with their mothers even though mothers' depression ratings did not change

Results: Infant Affect

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Infants' Facial Emotional States During the Still-Face Procedure

	Pre-Intervention (%)	Range (%)	Post-intervention (%)	Range (%)
1st Free Play				
Interest	39.6	5.0-81.0	67.0	25.0-85.0
Joy	2.8	0.0-13.0	13.0	0.0-50.0
Sadness	0.8	0.0-8.0	0.0	0.0
Anger	0.3	0.0-3.0	0.0	0.0
Still Face				
Interest	27.2	0.8-38.0	24.7	11.0-46.0
Joy	0.1	0.0-5.0	1.6	0.0-4.0
Sadness	2.1	0.0-8.0	4.8	0.4-15.0
Anger	0.0	0.0	0.4	0.0-2.0
2nd Free Play				
Interest	30.0	0.0-68.0	51.7	18.0-91.0
Joy	4.8	0.0-13.0	6.0	0.0-21.0
Sadness	0.6	0.0-12.0	5.0	0.0-28.0
Anger	0.0	0.0	2.2	0.0-23.0

N-11

Note: After interventions, infants showed marked increase in positive emotion expressions (Joy; Interest). Following the Still-Face perturbation (especially after interventions) some infants also showed an increase in negative emotions (Sadness; Anger). In general, in the post-intervention phase, infants communicated their feelings more clearly, as shown in higher frequency of emotion expression – likely anticipating mother's response to signals or cues about both pleasure and distress.

Letourneau Teen Moms Pilot RCT

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Table 5. Group Differences: Parent-Infant Interaction Total Scale and Subscale Scores

Dependent Variable		Intervention Mean	Control Mean	*t*	Confidence Interval	*p*	Effect Size
NCAFS 7-9 weeks	Total	64.6 (3.65)	57.4 (6.55)	2.57	1.16, 13.2	.012	1.36
	Parent	44.9 (2.55)	39.3 (5.92)	2.32	−.378, 10.8	.019	1.23
	Contingency	15.6 (1.13)	12.8 (2.66)	2.60	.476, 5.17	.011[a]	1.37
NCAFS 11-13 weeks	Parent	42.9 (2.32)	37.9 (2.85)	3.91	2.26, 7.75	.001	1.92
NCATS 11-13 weeks	Total	55.1 (4.49)	46.4 (9.15)	2.43	1.02, 16.48	.015	1.21
	Parent	37.3 (4.53)	31.9 (6.29)	1.96	−.501, 11.3	.035	1.72
	Child	17.9 (2.53)	14.5 (4.00)	2.02	−.215, 6.97	.032	.620
	Contingency	21.9 (2.36)	18.9 (3.76)	1.91	−.364, 6.36	.038	.897

Note. Standard deviations in parentheses. NCAFS, Nursing Child Assessment Feeding Scale; NACTS, Nursing Child Assessment Teaching Scale.

[a] Assumption of equality of variance violated.

Child Health Intervention and Longitudinal Development

VID-KIDS Pilot RCT for PPD

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Positioning:
- Infant is safe
- Conducive to interaction (i.e. face-to-face)
- Conducive to contact between mother and infant

Non-verbal/verbal behaviour of mother and infant: i.e. smiles, squirms, and other non-verbal signals from child

Cognitive growth fostering:
- Presence of teaching-loop
- Scaffolding (does mother help to promote self-discovery/mastery without intruding and completing the task for the infant)

Timing of mother and child's behaviour in relation to one another (i.e. contingency):
- Does mother talk after infant vocalizes? Or vice versa?
- Does infant smile at mother after she has vocalized?

Content of mother's speaking:
- Implication of words (explanatory versus imperative)
- Sounds

Presence of infant distress:
- Potent vs. subtle cues
- Maternal response

VID-KIDS

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Favoring the intervention group, significant group differences were observed in:

- NCATS *Caregiver-Child total scores*, F (1, 9) = 9.51, p = 0.0065, d = 1.43;
- NCATS *Sensitivity to Cues* F (1, 9) = 4.52, p = 0.031;
- NCATS *Cognitive Growth Fostering* F (1, 9) = 7.08, p = 0.013;
- NCATS *Caregiver Total Contingency* scores, F (1, 9) = 7.68, p = 0.011; and
- Infants' cortisol levels (F (1, 9) = 4.97, p = 0.027)
- Effect sizes ranged from d = 0.939-d=1.43) LARGE.

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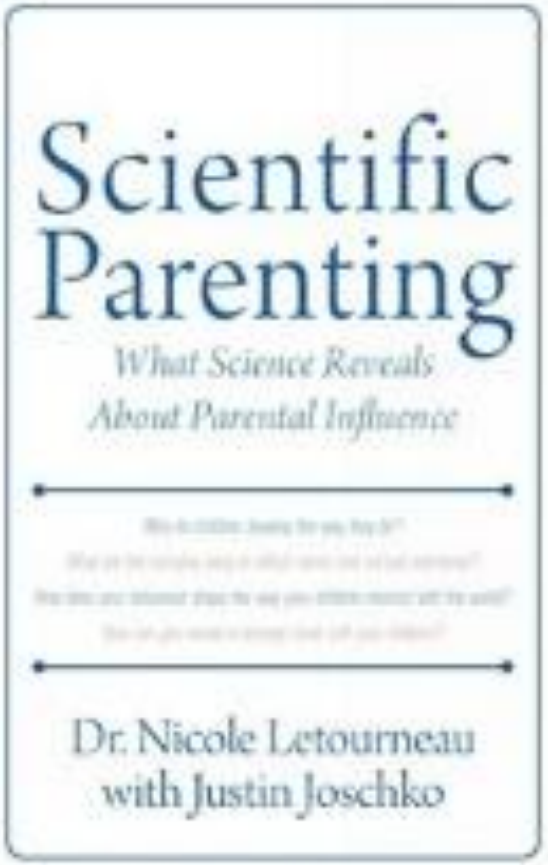
SCORING 2 VIDEOS

Child Health Intervention and Longitudinal Development

Thank you



Nicole.Letourneau@ucalgary.ca

www.childstudies.ca

@NicoleLynLetour (Twitter)