Influences of Maternal Touch on Prenatal Substance-Exposed Infant Affect

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Collaborating Project: ENRICH-1

• NIH-funded study:
  “The Ethanol, Neurodevelopment, Infant, and Child Health (ENRICH-1)”
  • **Principle Investigators:** Ludmilla Bakhireva, Ph.D. & Julia Stephen, Ph.D.

• **Overall Goals:**
  • Neurodevelopmental differences among children with prenatal alcohol, opiate, and no substance exposure
  • Ethanol biomarkers that predict neurodevelopmental differences in young children with prenatal substance exposure
  • Influence of infant-mother interactions & behaviors on neurodevelopmental differences
Two Steps for Project

• 1\textsuperscript{st} Step (Capstone Project & Postdoctoral Research Project):
  • Being trained on coding maternal touch and establishing inter-rater reliability among two coders and the master coder
  • Currently in progress – June of 2019

• 2\textsuperscript{nd} Step (ENRICH-1 study):
  • After inter-rater reliability is established, complete coding of Still-Face paradigms
  • After June of 2019
Introduction
Infant-Caregiver Relationship

• Consistent, nurturing, and responsive caregiving helps infants:
  • Communicate wants/needs
  • Emotion-regulation skills
  • Form healthy relationships

(Thompson Meyer, & Gross, 2007)
Spectrum of Substance Exposure Impact

- Alcohol Exposure
  - Alcohol Related Neurodevelopmental Disorder (ARND)
- Opiate Exposure
  - Neonatal Abstinence Syndrome (NAS)
- Fetal Alcohol Syndrome (FAS)
Exposure Effects on Self-Regulation

Higher risk of regulatory difficulties in early infancy:

- Suck-swallow-respiration co-ordination is impaired \((\text{Gewolb et al., 2004})\)
- Higher frequency crying \((\text{Quick, Robb, & Woodward, 2009})\)
- More feeding problems \((\text{Velez & Jansson, 2008})\)
- Increased arousal \((\text{LaGasse et al., 2003})\)
- Hypersensitivity to environmental stimuli \((\text{Dysart et al., 2007})\)
- Rated by caregivers as difficult to care for \((\text{Klee, Jackson, & Lewis, 2002})\)
Impact of Prenatal Substance Exposure

High risk of disordered infant-caregiver relationship:

- Less responsive (Minnes et al., 2005)
- Less sensitive (Minnes et al., 2005)
- More intrusive (Johnson et al., 2002)
Still-Face-Paradigm (SFP)

• Experimental procedure that enables researchers to examine the quality of caregiver-infant interactions, infant emotional regulation, attention, and behavior in socially-stressful situations

• 3 Phases:
  • Free play (baseline)
  • Still-Face (distressing)
  • Reunion
  • Optional 2nd Still-Face and 2nd Reunion

¹Tronick, Als, Adamson, Wise, & Brazelton, 1978
²Moszkowski et al., 2009
SFP: Free Play Phase

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SFP: Still-Face Phase

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SFP: Reunion Phase

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Infant Affect

• Still-Face Patterns:
  • Reduce positive affect (i.e., smiling less, gaze aversion)
  • Increase negative affect (i.e., more distress)

• Reunion Patterns:
  • Increase positive affect
  • Negative affect during still-face phase also carries over into reunion

(Mesman et al., 2009)
Prenatal Substance Exposure & SFP

• **Haley, Handmaker, & Lowe, 2006**
  - Infants with moderate-to-heavy prenatal alcohol exposure have been found to have elevated cortisol levels, heart rate, & increased negative affect during the Still-Face episode compared to a mild/no exposure group

• **Tronick, Messinger, Weinberg, et al., 2005**
  - Mothers of cocaine-exposed infants showed more negative engagement than other mothers and cocaine-exposed dyads showed higher overall levels of mismatched engagement states than non-exposed dyads
  - Infants exposed to heavier levels of cocaine showed more passive-withdrawn negative engagement and engaged in more negative affective matching with their mothers than other infants

• **Bendersky & Lewis, 1998**
  - Cocaine-exposed infants, compared with those who were unexposed to cocaine, showed less enjoyment during Still-Face episode with their mothers and continued to show negative expressions during the Reunion episode
ENRICH-1

• Pre-Existing Data:

• Infant affect
• Infant self-regulation
• Maternal interaction patterns
Prenatal Substance Exposure & Maternal Interactions

• Regardless of type of substance exposure, mothers that displayed more supportive parenting behavior involving sensitively responding to infant cues while utilizing playful strategies to re-engage with infants following distressing event tended to have infants with greater self-regulatory abilities

(Lowe et al., 2017)
Maternal Touch

• Serves various functions for infants:
  • Instilling safety
  • Reducing stress
  • Promoting emotion-regulation

(Jean & Stack, 2009)
Maternal Touch

Functions of Touch Scale *(Jean & Stack, 2009)*:

1) passive accompaniment  
2) active accompaniment  
3) nurturing  
4) playful  
5) attention-getting  
6) accidental  
7) utilitarian  
8) harsh or negative  
9) unspecified
Patterns of Maternal Touch & SFP

Jean & Stack, 2009:

• Free play: more attention-getting touch
• When infant displayed high levels of distress, more nurturing touch & trend of more active accompaniment than low levels of distress

Jean & Stack, 2012:

• Reunion: more playful & nurturing touch
Problem-Framing

- Emotion regulation = important area of study for high-risk populations due to their difficulty in regulating themselves & to be taken care of by caregivers (Klee, Jackson, & Lewis, 2002)

- Maternal interactions are crucial for emotion regulation, regardless of type of substance exposure

- Important to observe how different types of maternal behaviors, i.e., maternal touch, may play a role in regulating infant emotions & to feel supported by their caregivers (Hertenstein & Campos, 2001)

- Especially with infants prenatally exposed to specific types of substances
Method
IRB Approval

- This project uses pre-existing data from the ENRICH-1 study
  - IRB approval through UNM-Health Sciences Center (HSC) had been established
  - Pre-existing data involved video-recordings of Still-Face-Paradigms collected between 2016-2018

- Trainee obtained IRB approval through UNM-HSC to become an investigator for ENRICH-1 study
  - Completed required CITI training courses on social & behavioral research, confidentiality, & protected health information
  - Completed Financial Conflict of Interest (FCOI) training courses
  - Completed COI Disclosure for ENRICH-1 study
Training/Coding Touch

• Maternal touch based on Jean & Stack’s (2009) Functions of Touch

• 4 Types of Touch:
  1) Accompaniment
  2) Attention
  3) Nurturing
  4) Playful
Training/Coding Touch

• Second-by-second coding of touch during free play & reunion

• Coding Training
  • Establish coding reliability with master coder
  • Establish coding reliability with secondary coder
  • Maintain reliability throughout coding process (every 10th tape)

• 100 Tapes that are de-identified (trainee is also blind to group)
Participants

• **4 Groups:** *(for more information, see Bakhireva, Lowe, Gutierrez, & Stephen, 2015)*
  1) Prenatal alcohol only exposure in pregnancy
  2) Prenatal opiate only exposure
  3) Prenatal alcohol and opiate exposure
  4) No prenatal substance exposure (control)

• Opiate exposure is due to medically assisted treatment
Participants

- Infants: 6 months of age from New Mexico \((N = 100)\)
- Data collection began during pregnancy as part of larger study
- Ethnicity Diverse Sample

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Data Analysis

• Inter-rater reliability between trainee and mentor based on touch coding for every 10\textsuperscript{th} tape
Product & Dissemination
Product & Dissemination

- Touch coding would supplement ENRICH-1 study’s pre-existing data
- Publishing in a journal and/or a poster presentation for a conference for those in academia & pediatrics
- Because this relates to parenting behaviors, can also provide information on areas of intervention
References
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