Is Attachment Transmitted Across Generations?  
*The Plot Thickens*

Prachi Shah, MD
Peter Fonagy, PhD
Lane Strathearn, MBBS, PhD

1. Dept. of Pediatrics, University of Michigan
2. Anna Freud Centre, United Kingdom
3. Dept. of Pediatrics, Baylor College of Medicine

**BACKGROUND**

- Mothers’ mental representations of attachment relationships → infant quality of attachment (Main, Kaplan & Cassidy, 1985)

- Patterns of sensitive responsiveness appear to be intergenerationally transmitted as assessed through the AAI and SSP

- Meta-analysis of 13 studies demonstrated continuity between AAI and SSP classifications (Van Ijzendoorn, 1995)
  - 75% concordance on secure/insecure split
  - 63% concordance on 4-way classification

**MAIN (ABC+D)**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>CRITTENDEN (DMM)</th>
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<tbody>
<tr>
<td>Continuity/Disorganization</td>
<td>Self-protection/adaptation</td>
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**Classification Added**

- D : Disorganized
- A3-B, C3-B, A/C

**Model of attachment**

- Vary categorically:
  - Secure/Avoidant/Resistant
  - Disorganized

- Vary dimensionally:
  - Self-protective strategies : cognitive/affective

**Role of Fear**

- Disorganizing
- Organizing

**Representational system**

- Individual had 1 internal working model (IWM) of attachment that endured over time
- Multiple D.R. : Dispositional representations based on different processing pathways

- DMM characterizes patterns of attachment as self-protective strategies learned through interaction with attachment figures
- Predicated on adaptation, and can change over time
HYPOTHESES

1. Within secure attachment, there will be matching of attachment classifications
   • Type B mothers → Type B infants

2. Within insecure attachment, there will be evidence of inversion / meshing of attachment classifications
   • Type A mothers → Type C infants
   • Type C mothers → Type A infants

HYPOTHESES

3. DMM-SSP classifications will be related, but not identical to ABC+D SSP classifications

4. DMM-AAI classifications will be associated with ABC+D SSP classifications but less strongly than between the two DMM models

METHODS

Overview

• First time, pregnant women were recruited to participate in an fMRI study of maternal brain responses to infants’ facial expressions (Strathearn et al., 2009)

• Exclusions: psychotropic medications, cigarette use, left handed, contra-indications to MRI scanning

• Longitudinal design with 4 visits over 16 months: pregnancy, 7 months, 11 months, 14 months
METHODS
Overview
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- Exclusions: psychotropic medications, cigarette use, left handed, contra-indications to MRI scanning
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METHODS
Sample Characteristics: n= 49

<table>
<thead>
<tr>
<th></th>
<th>Mean / Percent</th>
<th>Range</th>
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<tbody>
<tr>
<td>Age (years)</td>
<td>27.8</td>
<td>19-41</td>
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<tr>
<td>Marital Status (Married)</td>
<td>70.5%</td>
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<tr>
<td>Income</td>
<td>&lt; $15,000 - &gt;$100,000</td>
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<tr>
<td>Maternal Education</td>
<td>79%</td>
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<tr>
<td>Maternal IQ</td>
<td>110</td>
<td>81-120</td>
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* No differences between mothers who participated at 14 mo. visit and those who were lost to follow-up.

METHODS
Procedure

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<tr>
<th>TIME</th>
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<td>Beck Depression Inventory</td>
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<td>Personality Disorder Questionnaire</td>
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<td>Demographic/ SES risk</td>
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<td>7 Mo.</td>
<td>Parenting Stress Index (Abidin, 1985)</td>
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<td>Adult Temperament Questionnaire-Short Form</td>
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<td>Infants Behavior Questionnaire- Revised</td>
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<td>14 Mo.</td>
<td>Mother-Infant Attachment (SSP)</td>
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DMM-Adult Attachment Interview

- DMM-AAI (Crittenden & Landini, in press):
  - Semi-structured interview which characterizes a mother's capacity to form secure attachment relationships
  - Based on the narrative of her childhood attachment experiences
  - Includes additional questions designed to probe for six memory systems
  - Strategies: Type B, Type A, Type C, Type A/C, Type AC

DMM Strategies In Adulthood
**Mother-Infant Attachment**

*Strange Situation Procedure*

- Gold-standard instrument used in assessing the quality of attachment in 12-18 month old infants
- Includes a series of eight separations and reunions between the mother and child, involving mild but cumulative stress for the infant
- Goal is to observe infant behavior upon final reunion with caregiver
  - B: (Secure): Demonstrate clear affective signals in the expectation of protective availability of their attachment figure
    - Proximity Seeking: baby demonstrates active initiative to seek physical proximity with caregiver
    - Contact maintenance: baby aims to maintain physical contact with caregiver
  - A: (Insecure/Avoidant): Avoid proximity and contact with caregiver
  - Ignore caregiver upon reunion: inhibit negative affect
  - C: (Insecure/Resistant): Angry/resistant behaviors to the caregiver; affectively distressed
  - A/C: Alternate use of A and C strategies depending on caregiver behavior

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**DMM Strategies in Infancy**

**Integrated True Information**

**True Cognition**

**True Affect**

- B1: Comfortable
- B2: Reserved
- B3: Assuasive
- B4: Reactive

- C1: Reactive
- C2: Passive

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**Classifications of the SSP**

- **B: Secure**
  - Demonstrate clear affective signals in the expectation of protective availability of their attachment figure
  - Proximity Seeking: baby demonstrates active initiative to seek physical proximity with caregiver
  - Contact maintenance: baby aims to maintain physical contact with caregiver
- **A: Avoidance**
  - Avoid proximity and contact with caregiver
  - Ignore caregiver upon reunion: inhibit negative affect
- **C: Resistance:**
  - Angry/resistant behaviors to the caregiver; affectively distressed
- **A/C:**
  - Alternate use of A and C strategies in accordance with specific relationships
DATA ANALYSIS

1. Univariate exploratory analysis of possible confounding variables on AAI and SSP
2. Comparisons between infant SSP classification and DMM and ABC+D methods using $\chi^2$, Fischer's exact test, or Phi-statistic
3. Delta-Prediction statistic employed to test hypotheses with row by row and cell by cell predictions

RESULTS: DMM-AAI

Secure(B): n=23 (47%)   Insecure(non-B): n= 26 (53%)

* No statistically significant differences between B and non-B mothers *
RESULTS : SSP-DMM

Secure(B): n=20 (41%)     Insecure(non-B): n= 29 (59%)

RESULTS : SSP-ABC+D

Secure(B): n=33 (67%)     Insecure(non-B): n= 16 (33%)

Attachment Distributions
Hypothesis 1: “Matching Hypothesis”

- Within secure attachment, there will be matching of attachment classifications
  - Type B mothers → Type B infants
- On 2-way comparison (DMM Secure-Insecure) mother infant classifications matched 73.4% of the time
- $\chi^2 = 10.684$, df $= 1$, $\kappa = 0.463$, $p = 0.001$

Prenatal AAI and 14mo DMM-SSP (% SSP predicted by AAI 4-way)

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<tr>
<td></td>
<td>Type B</td>
</tr>
<tr>
<td>Type B</td>
<td>65.2%</td>
</tr>
<tr>
<td>Type A</td>
<td>29.4%</td>
</tr>
<tr>
<td>Type C</td>
<td>0.0%</td>
</tr>
<tr>
<td>Type A/C</td>
<td>0.0%</td>
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</tbody>
</table>
Hypothesis 2: “Meshing Hypothesis”

- Within insecure attachment, there will be meshing of attachment classifications
  - Type A mothers $\rightarrow$ Type C infants
  - Type C mothers $\rightarrow$ Type A infants
- N=14 Anxiously attached mothers (A or C) had anxiously attached infants (A or C)
  - 7/10 Type A mothers had a Type C infant
  - 4/4 Type C mothers had a Type A infant
- $\chi^2 = 5.600, df= 1$  $p=0.018$; Fischer : $p=0.035$
- Full model : $\Delta\omega = 0.38$  $p= 0.001$

Hypothesis 3: DMM and ABC+D

- DMM-SSP classifications will be related, but not identical to ABC+D SSP classifications

Hypothesis 3: DMM and ABC+D

- DMM-SSP classifications will be related, but not identical to ABC+D SSP classifications
Hypothesis 4: *AAI and ABC+D*

- DMM-AAI classifications will be associated with ABC+D SSP classifications but less strongly than between the two DMM models

**SUMMARY OF FINDINGS**

1. DMM Classifications had lower rates of security (41% DMM-SSP and 48% DMM-AAI) than ABC+D AAP (67%)

2. (+) Evidence of intergenerational continuity for “transmission” of secure attachment

3. Opposite intergenerational “transmission” patterns noted for anxious attachment:
   - A → C
   - C → A
   - This suggests a mechanism of ADAPTATION for developing infant attachment security

4. Differences between DMM and ABC+D systems are due to differences in anxious attachment classification
Limitations

- Small sample size prevented testing fully for AC and A/C patterns
- Replication in larger sample is merited, including samples at risk
- AAI was only coded with DMM method, thereby preventing us from comparing fully DMM and ABC+D methods.

IMPLICATIONS

- Evidence of complimentary anxious strategies between mother and infant can guide intervention
- Maternal behavior is derived from maternal representations of the infant.
  - A focus on the mother’s D.R. is important in guiding treatment strategies
  - Psychoeducational strategies (for limited repertoire of skills)
  - Mentalization (if mother misreads infant’s cues)
  - Individual psychotherapy

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- Lane Strathearn, MBBS PhD
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prachis@umich.edu