Testing an Attachment based intervention effectiveness with adoptive mothers by assessing the role of dopamine and serotonin polymorphisms: A multisite RCT Study

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Pavia University, IT, Salesian University, IT, Queen Mary University, UK
• Theoretical background
• The Pavia Adoption study
• From VIPP/SD to VIPP/FCA
• Intervention effectiveness outcomes
• Mechanisms of change in Positive parenting
Theoretical background

1950, WHO, John Bowlby...
The infant and young child should experience a warm, intimate, and continuous relationship with his mother (or a permanent mother substitute) in which both find satisfaction and enjoyment.

2014, American Orthopsychiatry Association...
Every child has a basic right and need to grow up in a safe home with a stable continuous relationship with at least one adult who is a trusted, committed parent figure.
Theoretical background

Epigenetics and parenting..
Behavioral genetics of attachment aims at detecting the influence played by specific genes in explaining how some parents could be more or less “susceptible” to some environments (GXE).

Testing GxE through an attachment based intervention
Genetic factors could play an additive or interactive role in the explanation of whether and how a specific attachment-based intervention works.
<table>
<thead>
<tr>
<th><strong>VIPP-SD</strong></th>
<th><strong>ADOPTION VERSION</strong></th>
</tr>
</thead>
</table>
| • 7 home visits  
• Attachment, exploration,  
• Importance of sharing emotions  
• Disciplinary strategies, importance of positive reinforcement and empathy | • Small signals  
• Affect sharing and indiscriminate friendliness  
• Physical contact  
• Seeking help  
Children’s age range (from 18 up to 64 months) |
### Epigenetics and parenting

#### Evidences of the interplay between genetics and parenting

- Belsky & Pluess, 2009
- Bakermans-Kranenburg et al., 2011
- Baptista et al., 2016
- Bakermans & van IJzendoorn, 2016
- Chhaungur, Weeland et al., 2017

#### The mothers’ “susceptible” genetic markers chosen

- A dopaminergic genetic marker i.e. DRD4-VNTR
- A serotoninergic genetic marker 5HTTLPR
**STUDY DESIGN**

- **Aims:**
  1. To test VIPP-FCA intervention outcomes; i.e. increase in mothers’ Positive Parenting (emotional availability)
  2. To analyse a set of moderating variables as putative mechanisms of change in mothers

- **Study design:** multisite longitudinal RCT study with three time points of data collection (pre, post and follow up);

- **Sample size:** 80 families enrolled in 30 months; consecutive admission to adoption facilities
Sample

80 Adoptive mothers ($M_{\text{age}} = 42.73, SD = 3.79$), with their children ($M_{\text{age}} = 33.18$ moths, SD 16.38)

Children’s gender: 46.75% female
Country of origin: Asia; Est Europe; South America; Africa, Italy

Intervention group N = 42
Control group N = 38
No statistical gender difference was found ($X^2(1) = 1.07, p = .30$) neither for age at assessment $t (74.60) = -0.89, p = .37$).
Measures

• Emotional Availability Scale, 4th Ed.
  4 scales for the parent: sensitivity, structuring, non-intrusiveness, non-hostility
  2 scales for the child: child responsivity, child involvement
  Direct and total scores. A Positive parenting score and a competent child score

• Candidate “susceptible” genes systems: dopaminergic and serotoninergic.

• Polymorphisms inquired: DRD4-VNTR (any/7+) and 5HTTLPR (any s/s variant allele)
Hypotheses

1. VIPP-SD-FC/A intervention would promote positive parenting in adoptive mothers, increasing their emotional availability-EA

2. Mothers carriers of DRD4-7 allele repeat or of the 5HTTLPR-short allele of the intervention group would show higher improvement in positive parenting outcomes (i.e. EA scores)

3. Children would benefit from intervention with a key role played by maternal EA
### Distribution of candidate genes polymorphisms

<table>
<thead>
<tr>
<th>Gene</th>
<th>Marker</th>
<th>Genotype</th>
<th>Total N (%)</th>
<th>Control n (%)</th>
<th>Interv n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRD4</td>
<td>48 bp VNTR</td>
<td>any/7+</td>
<td>29(36%)</td>
<td>16(42%)</td>
<td>13(31%)</td>
</tr>
<tr>
<td>5HTTL PR</td>
<td>42 bp ins\del</td>
<td>S/S</td>
<td>15(19%)</td>
<td>8(21%)</td>
<td>7(16%)</td>
</tr>
<tr>
<td>Model</td>
<td>BIC</td>
<td>AIC</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>------------------------------------------------</td>
<td>---------</td>
<td>---------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Null model – random intercept</td>
<td>406.16</td>
<td>396.93</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 1 – time (^a)</td>
<td>405.37</td>
<td>393.07</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Model 2 – time + condition (^b)</td>
<td>407.38</td>
<td>392.00</td>
<td></td>
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</tr>
<tr>
<td>Model 3 – time x condition</td>
<td>402.75</td>
<td>384.31</td>
<td></td>
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<tr>
<td>Model 4a – Time x condition X 5HTTLPR</td>
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</tr>
<tr>
<td>Model 4b – Time x condition X DRD4 – 7 repeat</td>
<td>422.41</td>
<td>391.66</td>
<td></td>
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</tr>
<tr>
<td>Model 4c - Time x condition x at least</td>
<td>424.60</td>
<td>393.84</td>
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</table>
Effect of VIPP intervention on mothers’ outcomes

Timing. 1 = Pre-intervention; 2 = Post-intervention
<table>
<thead>
<tr>
<th>Model</th>
<th>BIC</th>
<th>AIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Null model – random intercept</td>
<td>524.55</td>
<td>515.33</td>
</tr>
<tr>
<td>Model 1 – time (^a)</td>
<td>512.34</td>
<td>500.03</td>
</tr>
<tr>
<td>Model 2 – time + condition (^b)</td>
<td>518.31</td>
<td>502.92</td>
</tr>
<tr>
<td>Model 3 – time x condition</td>
<td>502.36</td>
<td>486.91</td>
</tr>
<tr>
<td>Model 4 – Time x condition X maternal EA</td>
<td>403.79</td>
<td>382.26</td>
</tr>
<tr>
<td>Model 5 – Time x condition + gender</td>
<td>482.62</td>
<td>461.62</td>
</tr>
<tr>
<td>Model 6 – Time x condition + age at adoption placement</td>
<td>501.73</td>
<td>480.38</td>
</tr>
</tbody>
</table>
Effect of VIPP intervention on children’s outcomes

Timing, 1 = Pre-intervention; 2 = Post-intervention
Effect of VIPP intervention on children’s outcomes

![Graph showing the effect of VIPP intervention on children's outcomes. The graph plots Positive Parenting on the x-axis and Emotional Availability on the y-axis. The data points are color-coded to distinguish between Dummy intervention and VIPP intervention conditions.](image-url)
1. The present study is one of the largest to apply the new adapted version of the VIPP intervention in a population of adoptive parents of late-adopted older children, up to six years old.

2. Experimental design for testing GXE is a more compelling evidence if compared to correlational studies.

3. Sample size was the main limitation.

4. Multicentric studies could provide more compelling evidences even on GXE contribution in testing intervention effectiveness.
CONCLUSION

- Creating attachment relationships after attachment ruptures and adversities requires time and new connections development.

- After one year from adoption, parents and children start to speak the same emotional language.

- A video-feedback intervention may greatly foster this process by supporting parents and children in developing a secure and available emotional connection.

- GXE contribution to this process has still to be fully understood.
Thank you for your attention from the Pavia Adoption team!

Authors would like to thank all families who accepted to participate and
Cinzia Alagna, Elisa Berti, Cecilia Mecenate, Martina Montuschi, Elena Perez, Melvin Piro, Katiuscia Riccardi and Laura Rigobello for data collection.