Borderline Personality Disorder
Research Update:
Childhood Precursors, Predictors, & Risk Factors

Stephanie D. Stepp, Ph.D.
Associate Professor

Department of Psychiatry & Psychology
University of Pittsburgh School of Medicine
NAMI Potential Conflict of Interest Disclosures
(Stephanie D. Stepp, Ph.D.D.)

Grant/Research Funding Sources
• National Institute of Mental Health
• National Institute on Alcohol Use and Alcoholism
• National Institute on Drug Abuse
• National Institute of Child Health and Human Development
• Office of Juvenile Justice Delinquency Prevention
BPD Carries Severe Consequences

• Suicide rate: 8-10%

• High rates of costly treatment utilization: 6.3 inpatient days/year + 1 ER visit/year

• Chronic impairments: 40% received disability payments after 10+ year follow-up

Pompili, Girardi, Ruberto, & Tatarelli (2005); Zanarini, Frankenburg, Hennen, & Silk (2003); Gunderson, Stout, McGlashan, Shea, Morey, Grilo...Ansell (2011)
Developmental Approach Can Inform Prevention & Early Intervention

- Typical onset: early adolescence – emerging adulthood
- Most research has examined adults
- Limited ability to identify mechanisms and contextual risks predicting onset

Zanarini et al., 2006; Paris 2003

NAMI National Convention

Denver. July 6-9, 2016
Predictors

A. Risk Factors

B. Precursors
Time to onset

General risk

Precursor

Psychosocial adversity

Maltreatment/Trauma

Family Factors

Child factors

Signs & Sx

Crick et al., 2005; Stepp et al., 2010

NAMI National Convention

Denver. July 6-9, 2016
Significance of Precursors

Precursors *prospectively* increase the likelihood of BPD

- Early signs & symptoms that are similar to BPD phenotype
- Occur close in time to the onset of the disorder
- More specific than “risk factors”

Identification high-risk individuals

- Short-term longitudinal studies
- Identify pathogenic mechanisms

Indicated Prevention

- Intervention *prior* to full-blown disorder
- Requires detection of individuals experiencing precursors

*Chanen & McCutcheon, 2013; Eaton, Badawi, & Melton, 1995; Yung & McGorry, 1996*
Examining the Evidence for Precursors of BPD

1. Searched literature
   - Study design: Longitudinal, observational
   - Predictors: prospectively identified, increases risk of onset
   - Outcomes: diagnosis, symptoms, traits, features
   - 358 articles identified

2. Screened articles
   - 358 articles: title & abstract review ➔ 309 Excluded
   - 49 articles: full manuscript review ➔ 11 Excluded
   - 38 articles in final analysis

3. Extracted pre-defined data fields
   - Recorded study characteristics, measurement of risk factor and outcome, findings
   - 3 raters, double-coded
   - Stepp, Lazarus, & Byrd (in press)
Articles \((n = 38)\) by Publication Year

![Graph showing the number of articles by publication year from 1993 to 2015.](image-url)

- **1993 - 2000**: 5 articles
- **2001 - 2005**: 6 articles
- **2006 - 2010**: 9 articles
- **2011 - 2015**: 18 articles

**Publication Year**: 1993 - 2015

**Number of Articles**: 5, 6, 9, 18
Articles by Type of BPD Outcome

<table>
<thead>
<tr>
<th>BPD Outcome</th>
<th>Number of Articles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis</td>
<td>8</td>
</tr>
<tr>
<td>Symptoms</td>
<td>23</td>
</tr>
<tr>
<td>Traits/Features</td>
<td>7</td>
</tr>
</tbody>
</table>
Psychosocial Adversity & Maltreatment

**Limited Family Resources**
- Poverty
- Low maternal education
- Single parent household
- Stressful life events

*Carlson et al., 2009; Cohen et al., 2008; Conway et al., 2015; Stepp et al., 2015*

**Childhood Trauma**
- Neglect, verbal abuse, physical abuse, sexual abuse
- Early maternal separation
- Multiple moves for caregiver’s new partner(s)
- Perinatal adversities

*Belskey et al., 2012; Crawford et al., 2009; Johnson et al., 2009; Widom et al., 2009; Winsper et al., 2015; Wolke et al., 2012*
Family Adversity Exposure Moderates Effect of Negative Emotional Reactivity on BPD Symptoms

Age 16

High Family Adversity

Low Family Adversity

Age 17

High Family Adversity

Low Family Adversity

Age 18

High Family Adversity

Low Family Adversity

BPD Symptoms

High Negative Emotional Reactivity

Low Negative Emotional Reactivity

NAMI National Convention

Denver. July 6-9, 2016
Family & Parent-Child Factors

1. Attachment to caregiver
   • Insecure
   • Disorganized

2. Poor relationship quality
   • Low trust in caregiver
   • High maternal hostility

3. Emotional qualities
   • Low warmth
   • Control through guilt

4. Behavioral strategies
   • High behavioral control
   • Harsh punishment
   • Intrusive & inconsistent

Belskey et al., 2012; Carlson et al., 2009; Hammen et al., 2015

Bezirganian et al., 1993; Hallquist et al., 2015; Johnson et al., 2006; Stepp et al., 2014; Widom et al., 2012
Child Factors: Temperament & Psychopathology

1. Negative Affectivity
   • Emotionality
   • Affective instability
   • Experiential avoidance

2. Behavioral undercontrol
   • Low self-control
   • Low constraint
   • High impulsivity

3. Internalizing problems
   • Depression
   • PTSD Symptoms
   • Dissociation

4. Externalizing problems
   • ADHD
   • CD/ODD
   • Substance use

Hallquist et al., 2015; Jovev et al., 2013; Lenzenweger et al., 2005; Sharp et al., 2015; Stepp et al., 2014; Tragresser et al., 2007;

Bornovolova et al., 2013; Carlson et al., 2009; Burke & Stepp, 2012; Krabbendam et al., 2015; Miller et al., 2008; Stepp et al., 2012
### Specific Pattern of Prospective Associations between ADHD, ODD and Age 14 BPD symptoms

<table>
<thead>
<tr>
<th>Ages 8-13 Predictors</th>
<th>Depression</th>
<th>BPD</th>
<th>CD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADHD Trajectory</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher level</td>
<td>ns</td>
<td>.14**</td>
<td>.11*</td>
</tr>
<tr>
<td>Increasing: 8-10</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Increasing: 10-13</td>
<td>ns</td>
<td>.17*</td>
<td>ns</td>
</tr>
<tr>
<td><strong>ODD Trajectory</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher level</td>
<td>ns</td>
<td>.15*</td>
<td>.19*</td>
</tr>
<tr>
<td>Increasing: 8-10</td>
<td>ns</td>
<td>.24**</td>
<td>ns</td>
</tr>
<tr>
<td>Increasing: 10-13</td>
<td>.18*</td>
<td>ns</td>
<td>ns</td>
</tr>
</tbody>
</table>
Summary of the prospective evidence for BPD precursors

1. Predictors
   - Focus on ‘known’ general risk factors
   - Distal from outcome
   - Few control for 3rd variable influences or examine mediating processes
   - Limited information about contextual influences

2. Outcomes
   - Primarily predict symptoms; Few studies predict disorder (or even extreme group)
   - Onset? Maintenance? Exacerbation?
   - Few studies predict more than one outcome

3. Results concentrated within few cohorts
   - CIC (n = 6) or PGS (n = 5), 29% of articles
Developmental Course of BPD: Age-based Trajectories

BPD Symptoms / Traits

- Family Adversity
- Emotional Reactivity

10 years-old
15 years-old
20 years-old

NAMI National Convention
Denver. July 6-9, 2016
Limitations to the Age-based Approach

• Few studies include additional outcomes
  
  What pathways are distinct for BPD?

• Ignores stage of disorder:
  
  Onset? Maintenance? Exacerbation?

• Few studies predict disorder:
  
  Are processes same for symptom onset?
Increasing Prediction Accuracy: Converting Precursors into Prodromes

- Initial onset of Major Depressive Disorder
- Childhood Precursors
- Initial onset of BPD
Identifying a Prodromal Phase

Repeated assessments during a peak period of prevalence

1. Identify prodromal periods after onset
2. Examine signs and symptoms immediately before onset (precursors)
3. Examine specificity of relative risk to BPD
The Pittsburgh Girls’ Study
PIs: Hipwell & Stepp; Co-Is: Keenan & Loeber

• Enumerated the City of Pittsburgh
  • 100% sampling of low-income neighborhoods
  • 50% sampling of remainder

• Sampled 103,238 Pittsburgh households
  • 2,876 5-8 year-old girls identified
  • 2,450 agreed to participate (85.2%)
## Accelerated Longitudinal Study

| Cohort | Girls age (years) | 5 | 6 | 7 | ... | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|--------|-------------------|---|---|---|-----|----|----|----|----|----|----|----|----|----|----|----|
| 5      | PT                | PT | GPT| GPT| GPT| GPT| GPT| GPT| GP | W  | W  | *  |    |    |    |    |
| N=588  |                   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 6      | PT                | GPT| GPT| GPT| GPT| GPT| GPT| GPT| GP | W  | W  | W  | *  |    |    |    |
| N=630  |                   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 7      | GPT               | GPT| GPT| GPT| GPT| GPT| GPT| GPT| GP | W  | W  | W  | W  | *  |    |    |
| N=611  |                   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 8      | GPT               | GPT| GPT| GPT| GPT| GPT| GPT| GPT| GP | W  | W  | W  | W  | W  | *  |    |
| N=622  |                   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

* Indicates Current Assessment Wave (Wave 16)
G = Girl transitioning to W = Woman; P = Parent; T = Teacher
By age 22, 260 (10.6%) of youth onset to BPD+ screen

Rate of onset slows over this age period
Frequency of Onset by Age

Mean age: 16 (SD = 2 years)
Time from Symptom Onset to Disorder

- **Time from 1\textsuperscript{st} symptom → clinical cut-off**
  - $M = 5$ years, $SD = 1.4$ years
  - Range: 1-8 years
  - 73% experienced 1\textsuperscript{st} symptom by age 14

- **Presence of symptoms**
  - 66.0% of girls experienced $\geq 1$ symptom, between ages 14 & 22
  - Similar rate of DEP/ANX symptoms (~50-60%)
<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Early Adult Disorder</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>BPD</strong></td>
<td><strong>MDD</strong></td>
</tr>
<tr>
<td></td>
<td><strong>n = 64, 2.6%</strong></td>
<td><strong>n = 74, 4.7%</strong></td>
<td></td>
</tr>
<tr>
<td>Precursor Signs &amp; Symptoms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk factor</td>
<td></td>
<td>Relative Odds</td>
<td>Relative Odds</td>
</tr>
<tr>
<td>Family Adversity</td>
<td></td>
<td>3.63</td>
<td>3.52</td>
</tr>
<tr>
<td>Temperament Emotionality</td>
<td></td>
<td>1.01</td>
<td>1.01</td>
</tr>
<tr>
<td>Clinical sign</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADHD</td>
<td></td>
<td>1.61</td>
<td>1.11</td>
</tr>
<tr>
<td>ODD</td>
<td></td>
<td>1.22</td>
<td>1.15</td>
</tr>
<tr>
<td>Precursor Signs &amp; Symptoms</td>
<td>Early Adult Disorder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BPD (n = 64, 2.6%)</td>
<td>MDD (n = 74, 4.7%)</td>
<td></td>
</tr>
<tr>
<td><strong>BPD symptom</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impulsivity</td>
<td>4.24</td>
<td>1.91</td>
<td></td>
</tr>
<tr>
<td>Unstable relationships</td>
<td>2.68</td>
<td>1.09</td>
<td></td>
</tr>
<tr>
<td>Non-suicidal self-injury</td>
<td>6.34</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>Suicide</td>
<td>1.44</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td>Emptiness</td>
<td>4.07</td>
<td>1.91</td>
<td></td>
</tr>
<tr>
<td>Anger</td>
<td>7.49</td>
<td>2.77</td>
<td></td>
</tr>
<tr>
<td>Affective instability</td>
<td>7.95</td>
<td>2.58</td>
<td></td>
</tr>
<tr>
<td>Dissociation</td>
<td>4.61</td>
<td>2.21</td>
<td></td>
</tr>
<tr>
<td>Abandonment fears</td>
<td>3.15</td>
<td>1.18</td>
<td></td>
</tr>
<tr>
<td>Identity disturbance</td>
<td>2.99</td>
<td>1.72</td>
<td></td>
</tr>
</tbody>
</table>
Identifying Precursors of Chronicity

• Predicting youth with BPD diagnosis across adolescence and young adulthood

• 160 girls onset in adolescence
  – 57 continued to screen positive for BPD during young
  – 103 remitted

• Identify precursors of onset for those youth in the “stable” group
Symptom Profile Year Prior to Onset that Predicts Risk

• Threatened suicide

• Felt empty much of the time

• Frequent temper tantrums and anger
Summary

• Potential group of “close-in” precursors

• Examine attributable risk

• Replication in additional datasets
Future Directions

• Recruiting a potential high-risk sample

• Continue to conduct analyses with the PGS as they age

• Examine precursor signs & symptoms
Acknowledgements

- PGS participants & staff
- Emotion & Personality Development Lab
- Amy Byrd, Ph.D.
- Alison Hipwell, Ph.D.
- Sophie Lazarus, Ph.D.
- Lori Scott, Ph.D.