Transforming Parent-Child Interaction in Family Routines: A Longitudinal, Single Subject, Sequential, and Multivariate Analysis with 10 families

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Celebrating Learning Week
University of British Columbia
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Overview
- Seven-year study of an ecological, family-centered positive behaviour support (PBS) approach with parents of children with developmental disabilities and severe problem behaviour
  - Theoretical Question:
    - Within a PBS approach, to what extent does a broader ecological unit of analysis contribute to meaningful, durable, and sustainable improvements in child behaviour and participation in family life?

Ecological Unit of Analysis: Parent-Child Interaction in Family Routines
- Three levels of family ecology
  - Function of child problem behaviour (Repp & Horner, 1999)
  - Processes of parent-child interaction (Patterson, 1982)
    - Coercive processes
    - Constructive processes
  - Family activity settings (routines) (Gallimore, 2005; Vygotsky, 1978)

Potential Contributions to Child and Family Outcomes
- Parent implementation fidelity
- Durable improvements in child behaviour and quality of family life
- Sustainable use of PBS strategies by family members
- Adaptable use across the child and family lifecycle

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Project Mission

- Empower families of children with developmental disabilities and problem behaviour to transform coercive parent-child interaction in problematic family routines into constructive parent-child interaction in successful family routines.

Escape-Driven Coercive Process (Lucyshyn et al., 2004)

- Parent: Request/Demand → Reduce Demand

Child: Problem Behaviour → Terminate or Reduce Problem Behaviour

Attention-Driven Coercive Process (Lucyshyn et al., 2004)

- Parent: Busy → Attention

Child: Problem Behaviour ← Terminate Problem Behaviour

Central Aim: Transformational Change

- Transform (Webster Dictionary):
  - to change in composition or structure
  - implies a major change in form, nature, or function
  - to change one thing into another thing

To Change one Thing ...

... Into Another

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Oliver Wendell Holmes Jr.

"One’s mind, once stretched by a new idea, never returns to its original dimensions."

Transform Escape-Driven Coercive Processes into ...

Parent: Request/Demand
Reduce Demand

Child: Problem Behaviour
Terminate or Reduce Problem Behaviour

... Constructive Processes in Routines in which Parent Demands are Common

Parent: Request/Demand
Positive Attention

Child: Compliance
Task Engagement and/or Neutral Behaviour

Transform Attention-Driven Coercive Processes into ...

Parent: Busy
Attention

Child: Problem Behaviour
Terminate Problem Behaviour

... Constructive Processes in Family Routines in which Parents are Busy

Parent: Busy
Positive Attention

Child: Task Engagement
Task Engagement or Neutral Behaviour

Methods
Participants
- Ten families
  - 7 Caucasian
  - 3 Asian
- Children with developmental disabilities
  - autism
  - intellectual disability
  - ages 3–8 at start of study in 2004
- Problem behaviours in home and/or community routines
  - defiance, screaming, aggression, disruptive behaviour, destructive behaviour

Settings
- Valued but unsuccessful routines in the home and community
  - Two categories
    - Escape-driven
      - Reading routine
      - Restaurant routine
    - Attention-driven
      - Parent preparing supper/child free-time
      - Bedtime

Dependent Variables
- Child problem behaviour
- Routine steps completed by child
- Conditional probability of coercive processes and constructive processes
- Joint Frequency and Yule's Q of coercive and constructive processes
- Family functioning
  - Parenting Stress Index (PSI)
  - Family Quality of Life (FQOL)
  - Parent Locus of Control (PLOC)
- Social validity

Independent Variable: Family-Centered PBS Approach
- Build collaborative partnership
- Conduct comprehensive assessment
  - Family ecology assessment
  - Functional assessment
- Design behaviour support plans
  - focus on improving valued family routines
  - multicomponent
  - technically sound
  - contextually appropriate
- Identify family-centered supports

Independent Variable: Family-Centered PBS Approach (continued)
- Provide initial training and support
  - modeling, coaching, and behavioural rehearsal, as needed
  - self-monitoring checklists
  - family-centered supports, as needed
- Provide maintenance support
  - relapse prevention training
  - parent self-assessment of coercive interaction
  - teach and encourage family members to solve new or recurring problems on their own

Family Centered Practices
(Christenson & Sheridan, 2001)
- Family Orientation
  - Willingness to orient services to the whole family, rather than just child with a disability
- Positiveness
  - A philosophy of thinking the best about parents without passing judgment
- Sensitivity
  - Demonstrating an understanding of the families concerns, needs and priorities
- Responsiveness
  - “Doing whatever needs to be done.”
Family Centered Practices (Christenson & Sheridan, 2001) (continued)

- Friendliness
  - Developing a reciprocal relationship, offering practical help, and conveying care for both parents and child
- Child and Community Skills
  - Knowledge about child development and disabilities and methods for teaching
  - Eagerness to establish collaborative relationships with other service providers

Positive Behavior Support Plans: Essential Components

- Embed natural reinforcers in routines
- Use visual supports to increase predictability and to prompt desired behaviour
- Offer choices
- Use positive contingencies to motivate positive behaviour
- Use safety signals to build endurance for delay
- Use errorless teaching methods

PBS Plans: Essential Components (continued)

- Teach functional communication skills
  - Requesting a break
  - Requesting help or attention
- Reward desired behaviour
- Honour child’s use of language to attain a want or need
  - For a break, for help, or for attention
- Positively redirect minor problem behaviours
- Ensure that major problem behaviours do not achieve their purpose (e.g., escape, attention, item or activity)

Research Designs

- Group designs across 10 families
  - Problem behaviour and routine steps completed
  - Joint frequency and Yule’s Q of coercive and constructive processes
  - Family functioning measures (7 families)
- Single subject research design with each family
  - 10 multiple baseline designs across family routines
  - Three phases: Baseline; Intervention; Follow-up

Research Designs (continued)

- Sequential analyses of transformation of coercive processes into constructive processes in family routines

Results

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Overview

- Group design results for problem behaviour & routine steps completed
- Sequential analysis results across 10 families
- Joint frequency and conditional probabilities
- Group comparisons of joint frequency and Yule’s Q
- Group design results for family functioning
- 2 case studies of transformational change
- Single subject research data
- Sequential analysis data
- Social validity ratings
- Family perspectives (video)

Group Design Results: Problem Behaviour & Steps Completed

Statistical Analyses of Improvements in Coercive & Constructive Processes

<table>
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<tr>
<th>Process</th>
<th>M</th>
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Note: *p = 0.05, representing the critical value of two-tailed t-test (t-statistic is based on 30-df test of significance)

Family Functioning Results: Decreases in Parenting Stress

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Note: *p = 0.05, representing the critical value of two-tailed t-test (t-statistic is based on 25-df test of significance)

Family Functioning Results: Increases in Family Quality of Life

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Note: *p = 0.05, representing the critical value of two-tailed t-test (t-statistic is based on 25-df test of significance)

Statistical Analysis of Changes in PSI & FQOL

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<thead>
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<th>Year</th>
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<th>r</th>
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<td>1.28</td>
<td>0.71</td>
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<tr>
<td>3</td>
<td>4.44</td>
<td>2.67</td>
<td>4.08</td>
<td>.015</td>
<td>235</td>
</tr>
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</table>

Note: *p = 0.05, representing the critical value of two-tailed t-test (t-statistic is based on 25-df test of significance)
Family Functioning Results: Improvements in Parent Locus of Control

2 Family Case Studies of Transformational Change

Child and family information
Multiple baseline design data
Sequential analysis data
Social validity and contextual fit
Family perspectives
- Family 2: Etienne
- Family 3: Wood

Family 2: Etienne Family
- 4 - 9 year-old boy with autism
- High functioning
- Verbal
- Good sense of humour
- Family: American (mother) and Canadian (father)
  - Mother: tax clerk
  - Father: navigation officer --> businessman
  - Older sister (6-11 years old)
- Problem behaviours
  - Defiance, physical aggression, tantrums, physical resistance, disruptive/destructive behaviour, screaming/crying, food refusal
- Routines
  - Bedtime; drinking from cup; dinner time; restaurant

Format of Sequential Analysis Results
- Conditional probabilities of 2nd, 3rd, and 4th steps in coercive process and in constructive process
  - Relative frequency, e.g., (764)
  - Conditional probability, e.g., .35
  - Statistical significance, e.g., p < .05

Baseline: Conditional Probability of Escape-Driven Coercive Process

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**Baseline: Conditional Probability of Constructive Process**

<table>
<thead>
<tr>
<th>Parent: Demand</th>
<th>Positive Attention</th>
</tr>
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<tbody>
<tr>
<td>(12)</td>
<td>(5)</td>
</tr>
<tr>
<td>.05</td>
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<td>&lt;.04-</td>
<td>.15+</td>
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<tr>
<td>(.00</td>
<td>.44-</td>
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</table>

Child: Compliance or Neutral Behaviour

**Intervention: Conditional Probability of Escape Driven Coercive Process**

<table>
<thead>
<tr>
<th>Parent: Demand</th>
<th>Withdraw or Reduce Demand</th>
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<tr>
<td>(4)</td>
<td>(0)</td>
</tr>
<tr>
<td>.04</td>
<td>.00</td>
</tr>
<tr>
<td>&lt;.001</td>
<td>&lt;.18-</td>
</tr>
<tr>
<td>(.00</td>
<td>&lt;25-</td>
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</table>

Child: Problem Behaviour or Acceptable Beh.

**Intervention: Conditional Probability of Constructive Process**

<table>
<thead>
<tr>
<th>Parent: Demand</th>
<th>Positive Attention</th>
</tr>
</thead>
<tbody>
<tr>
<td>(69)</td>
<td>(31)</td>
</tr>
<tr>
<td>.61</td>
<td>.46</td>
</tr>
<tr>
<td>&lt;.001</td>
<td>&lt;.001</td>
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</table>

Child: Compliance or Neutral Behaviour

**Family 2: Social Validity and Contextual Fit**

- **Social Validity**
  - 7 measures (2005-10)
  - 4.9 Average
  - Range 4.5 – 5.0

- **Goodness of Fit**
  - 8 measures (2005-10)
  - 4.8 Average
  - Range 4.1 - 5.0

**Family 3: Wood Family**

- 4 – 9 year old boy with autism
  - non-verbal (at start of study)
  - low functioning
  - affectionate and loving
  - Family of Northern European Heritage
  - Mother – Homemaker
  - Father – Businessman
  - Older brother (5 – 10 years old) has high functioning autism

- **Problem Behaviors**
  - severe food refusal, physical aggression, disruptive/destructive behavior, negative vocalizations, physical resistance, running away

- **Routines**
  - Snack time; dinner time; reading with mom; restaurant with dad

**Family 3: MB Design Results for Problem Behaviour and Routine Steps Completed**
Baseline: Conditional Probability of Escape-Driven Coercive Process

Parent: Demand  
Withdraw or Reduce Demand  

Child: Problem Behavior  
Reduce Problem Behavior  

Baseline: Conditional Probability of Constructive Process

Parent: Demand  
Positive Attention  

Child: Compliance  
Positive or Neutral Behavior  

Intervention: Conditional Probability of Escape Driven Coercive Process

Parent: Demand  
Withdraw or Reduce Demand  

Child: Problem Behavior  
Reduce Problem Behavior  

Intervention: Conditional Probability of Constructive Process

Parent: Demand  
Positive Attention  

Child: Compliance  
Positive or Neutral Behavior  

Family 3: Social Validity and Contextual Fit (1 to 5 Likert Scale)

- Social Validity
  - 8 measures (2005-10)
  - 4.8 Average
  - Range 4.2–5.0

- Goodness of Fit
  - 10 measures (2005-10)
  - 4.6 Average
  - Range 4.1–5.0

Discussion
Summary

- Statistically significant improvements in child behavior and routine steps completed across 10 families
- 9 of 10 families showed transformation of coercive processes into constructive processes in target family routines
- Statistically significant improvements in parenting stress, family quality of life, and parent locus of control
- 9 of 10 families viewed approach as acceptable and important
- 4 of 10 families evidenced a level of change that may be considered transformational

Factors Associated with Transformation of Coercive Processes

- Robust, technically sound and contextually appropriate PBS plan
- Strong therapeutic alliance between the family and interventionist
- Adjunctive family-centered supports, as needed
- Coordination of support with other service providers, if present
- Lifespan perspective
- Time

Factors Associated with Absence of Transformational Change

- Father’s level and quality of participation
  - non-participation
  - withdrawal from participation due to work demands or health problems
- Tenacious attitudes and beliefs inconsistent with principles of behaviour change
- Multiple family systems issues
  - maternal hopelessness and sibling substance abuse
  - marital conflict and pessimism
- Cultural views of child disability

Factors Associated with Transformational Change

1. Partnership between mother and father
2. Father's active participation and full support
3. Interventionist tenacity
   - Going parents’ pace
   - Unwavering encouragement

Cautions and Limitations

- Family-centered PBS approach as implemented was largely effective but not efficient
- Time required influenced by:
  - ecological scope of change goals
  - multiple baseline research design’s experimental control requirements
  - shared control over pace of study
  - severity of child problem behaviour
  - family life stressors or family systems challenges
  - level of prior experience and training of interventionist

Cautions and Limitations (continued)

- Parenting Stress scores improved but on average still above normative level (i.e., above 85th percentile)
Future Research

- Increase efficiency of approach by using generalization promotion strategies
- Design and use web-based and interactive DVD technology
  - develop highly accessible and useful parent education materials, and training and support methods
- Collaborate more closely with families to define family quality of life goals at very start of support process
- Use new ‘design’ research methods with one family to pilot enhanced approach before implementing on larger scale

References