

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



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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

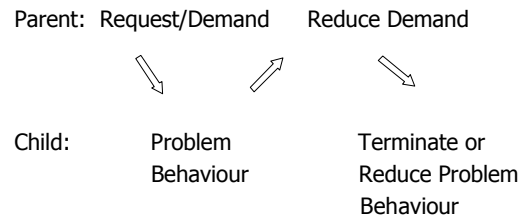


- Parent implementation fidelity
- Durable improvements in child behaviour and quality of family life
- Sustainable use of PBS strategies by family members
- Adaptable use across the child and family lifecycle

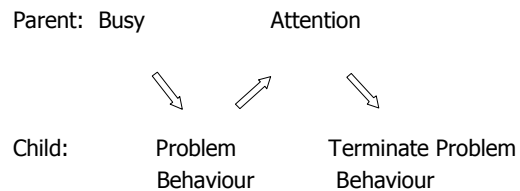
Project Mission

- 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)



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



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



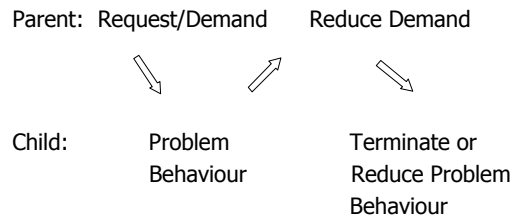


Oliver Wendell Holmes Jr.

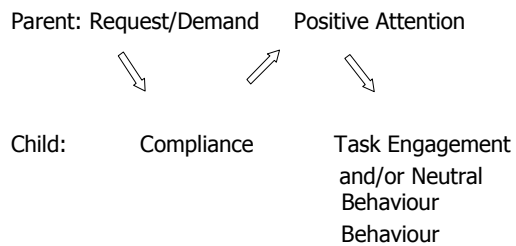
- "One's mind, once stretched by a new idea, never returns to its original dimensions."



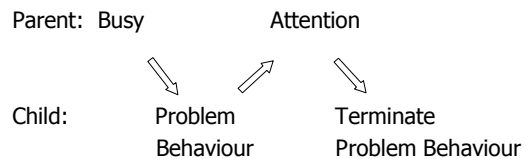
Transform Escape-Driven Coercive Processes into ...



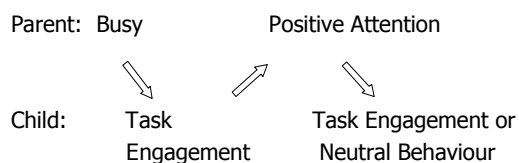
... Constructive Processes in Routines in which Parent Demands are Common



Transform Attention-Driven Coercive Processes into ...



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



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



Indep. 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)

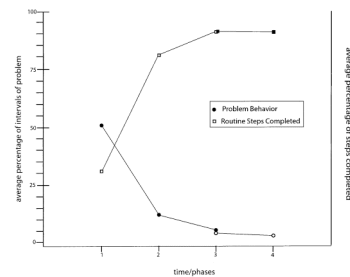
- Sequential analyses of transformation of coercive processes into constructive processes in family routines

Results

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

Descriptive Statistics (M, SD) and Wilcoxon Signed Rank Test for Joint Frequency of Coercive Processes and Constructive Processes from Baseline to Intervention (N = 10)

Process	Baseline		Intervention		T_z	z	p
	M	SD	M	SD			
Coercive:							
2-steps	135.00	79.51	16.50	19.13	0.0	-2.80	.005
3-steps	81.50	47.59	11.10	16.75	0.0	-2.80	.005
4-steps	40.40	18.80	7.45	12.49	0.0	-2.80	.005
Constructive:							
2-steps	94.00	58.54	148.90	104.95	3.83	-1.63	.103
3-steps	29.8	33.86	67.80	42.63	5.33	-2.09	.037
4-steps	15.80	19.19	45.9	22.58	2.50	-2.55	.011

T_z = test statistic, representing the smaller of two mean ranks; z statistic is based on 2-tailed test of significance.

Family Functioning Results: Decreases in Parenting Stress

Table 12

Means and Standard Deviation of Fathers and Mothers Total Stress Score on the Parenting Stress Index (PSI) from Year 1 to Years 5-6

Year	Mother (n = 7)		Father (n = 6)	
	M	SD	M	SD
1	333.71	24.49	310.33	33.14
2	309.71	34.63	291.17	46.16
3	304.86	26.97	287.83	36.00
3.5-4	292.86	32.57	290.83	42.11
5-6	283.57	34.03	288.17	35.01

Note. Year 1 = Baseline; Years 2, 3, and 3.5-4 = Intervention; and Years 5-6 = Follow-up

Family Functioning Results: Increases in Family Quality of Life

Table 13

Means and Standard Deviation of Fathers and Mothers Average Satisfaction Rating for Family Quality of Life Survey (FQOL) from Year 1 to Years 5-6

Year	Mother (n = 7)		Father (n = 6)	
	M	SD	M	SD
1	3.00	.804	3.12	1.16
2	3.28	.584	3.57	.646
3	3.14	.652	3.32	.833
3.5-4	3.66	.412	3.57	.961
5-6	3.46	.422	3.62	.736

Note. Year 1 = Baseline; Year 2, 3, and 3.5-4 = Intervention; and Years 5-6 = Follow-up.

Statistical Analysis of Changes in PSI & FQOL

Mixed Analysis of Variance Results for Effects of Family Centered PBS on Parenting Stress and Family Quality of Life for Parents from Year 1 to 5-6 (N = 13)

Parent	df	SS	MS	F	p	η^2
Total Parenting Stress						
Time	4,44	9852.12	2463.03	6.08	.001	.356
Gender	1,11	2054.00	2054.00	0.47	.508	.041
Time x Gender	4,44	1841.355	460.34	1.14	.352	.094
Family Quality of Life Rating						
Time	4,44	2.67	0.668	3.43	.016	.238
Gender	1,11	1.28	0.278	0.14	.714	.013
Time x Gender	4,44	0.24	0.060	0.31	.872	.027

Note. A mixed between-within subjects analysis of variance was conducted. Analysis included parents of 7 families (7 mothers and 6 fathers): Families 2, 3, 4, 5, 6, 11, and 12.

Family Functioning Results: Improvements in Parent Locus of Control

Means, Standard Deviations, Medians, and Friedman Test Results for Parent Locus of Control Scale (N = 12)

Factor		Year					$\chi^2(4)$	p
		1	2	3	4	5		
Parent Efficacy	M	20.4	17.8	16.2	16.6	26.4		
	SD	7.05	4.39	5.06	4.52	8.72		
	Min	17.0	17.0	15.0	16.0	15.5	6.40	.002
Parent Responsibility	M	25.8	27.5	25.8	25.7	26.4		
	SD	7.33	6.96	8.13	7.29	8.72		
	Min	26	28.5	24.5	24.5	27	2.24	.692
Child Control of Parents Life	M	21.8	19.6	19.3	19.2	18.4		
	SD	5.31	4.32	4.90	4.91	3.58		
	Min	22.0	20.0	20.5	20.0	18.0	8.66	.070
Parental Belief in False Chance	M	26.3	26.5	25.4	24.7	23.0		
	SD	6.43	4.50	5.55	5.45	4.90		
	Min	27.5	27.5	24.5	24.5	24.0	9.87	.043
Parent Control of Child's Behavior	M	36.0	34.6	32.3	30.9	28.9		
	SD	7.88	6.40	6.36	7.22	6.64		
	Min	38.0	35.5	32.5	31.5	28.5	10.00	.028

Note: Results are for mothers and fathers in 5 families. Min = Median. Year 1 = Baseline Years 2, 3, and 4 = Intervention and Years 5 & 6 = Follow-up.

2 Family Case Studies of Transformational Change

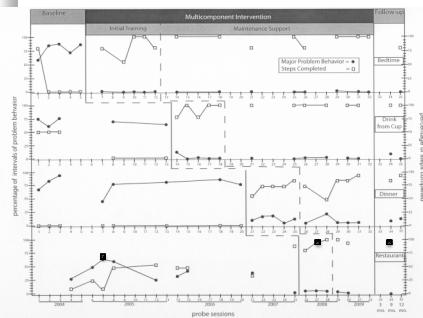
Child and family information
Multiple baseline design data
Sequential analysis data
Social validity and contextual fit
Family perspectives

- 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

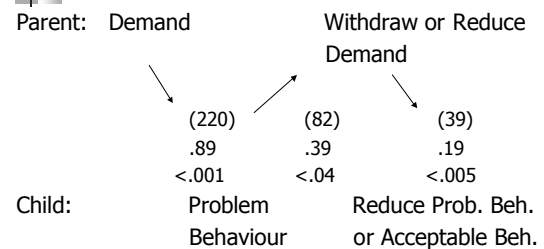
Family 2: Multiple Baseline Design Results for Problem Behaviour



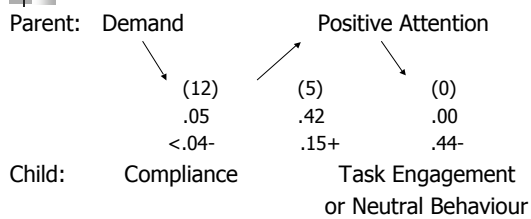
Format of Sequential Analysis Results

- 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., $p < .05$

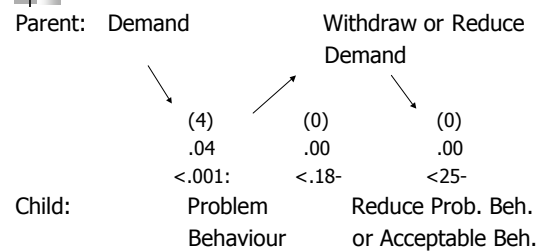
Baseline: Conditional Probability of Escape-Driven Coercive Process



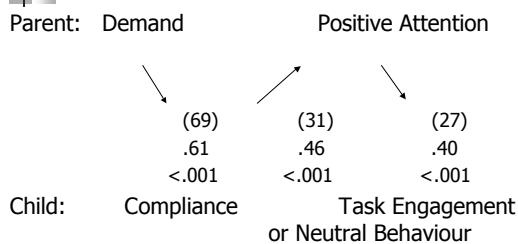
Baseline: Conditional Probability of Constructive Process



Intervention: Conditional Probability of Escape Driven Coercive Process



Intervention: Conditional Probability of Constructive Process



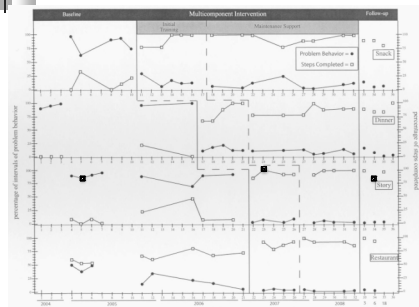
Family 2: Social Validity and Contextual Fit (1 to 5 Likert Scale)

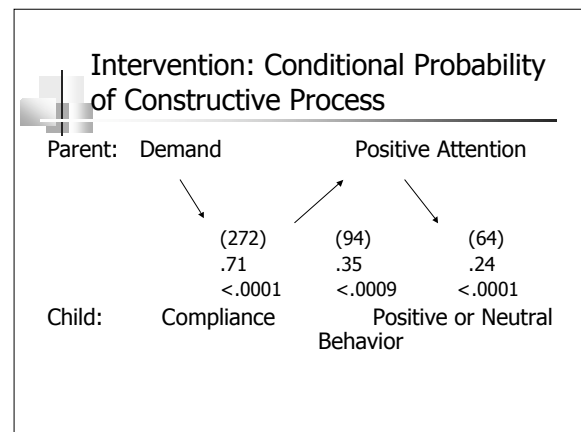
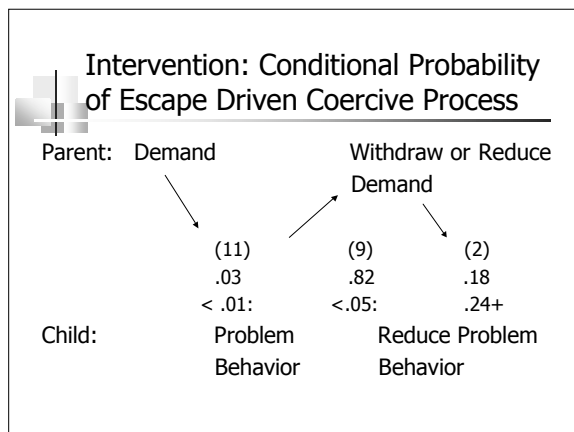
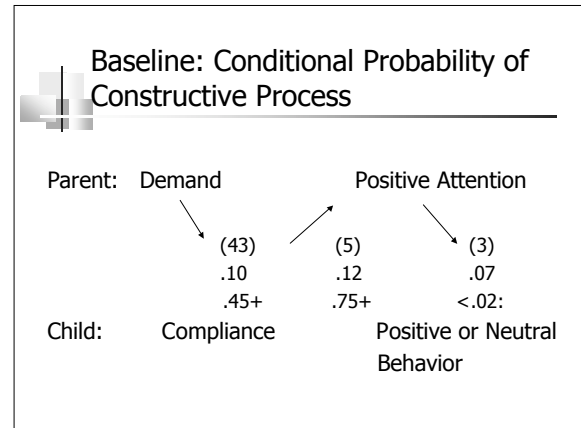
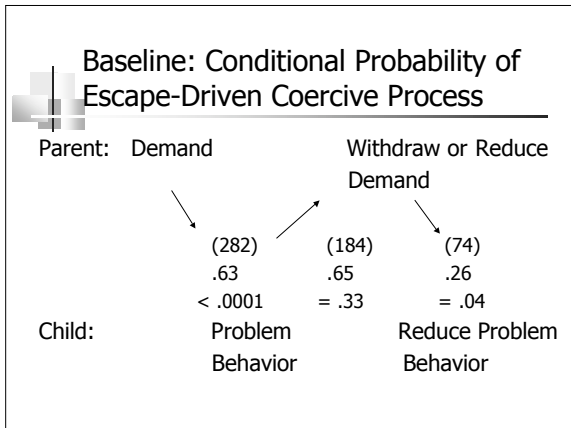
- Social Validity
 - 7 measures (2005-10)
 - 4.9 Average
 - Range 4.5 – 5.0
- Goodness of Fit
 - 8 measures (2005-10)
 - 4.8 Average
 - Range 4.1 – 5.0

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





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

Social Validity	Goodness of Fit
■ 8 measures (2005-10)	■ 10 measures (2005-10)
■ 4.8 Average	■ 4.6 Average
■ Range 4.2-5.0	■ 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 Transformational Change

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

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

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



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