Using Reliable Change to Calculate Clinically Significant Progress in Children with EBD: A BHRS Program Evaluation

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Abstract

Children often have complex emotional and behavioral disorders (ADHD, ODD, Depression, PTSD, etc.). A large amount of research exists in the behavioral treatment of children with these disorders regarding specific behavioral problems. Much less research exists for the treatment of comprehensive problematic behaviors that these children experience in the real world. This effectiveness study evaluates the program at Behavior Analysis & Therapy Partners (BATP) for the treatment of children in their program with emotional and behavioral disorders. Sixteen children were treated in the community using what has come to be known as Behavioral Health Rehabilitative Services (BHRS) in the state of Pennsylvania. BATP uses a behavior analytic model for treating these disorders which features a functional behavioral assessment of problem behaviors and individual interventions based on the understanding of function. This evaluation found that 62.5% of the children made clinically significant reliable change within 278 days of entering the program. This paper presents a detailed analysis of those results. Since this is the first evaluation of the therapeutic properties of BHRS, clinical implications and future research directions are highlighted.
Keywords: Reliable Change, Outcome Data, BHRS Effectiveness, EBD Treatment

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Emotional and behavioral disorders (EBD), as defined by Cook, Gresham, Kern, Barreras, Thorton, and Crews (2008), refers "to the full spectrum of students with social, emotional, and behavioral problems that do and do not receive special education services" (p. 132). The problematic behaviors can be of an internalizing or an externalizing characteristic – with children experiencing bouts of mild or clinical depression, attention deficit hyperactivity disorder (ADHD), conduct disorder (CD), oppositional defiant disorder (ODD), and even non-clinical externalizing behaviors – and, largely, educational programs of the past have been unsuccessful in helping these children thrive (Cook et al., 2008; Jull, 2008). Children with EBD often have behavioral problems that lead to marked impairments in the academic performance (Nordess, 2005). On average, children with EBD receive lower grades and fail more courses with a drop-out rate exceeding 50% (Sacks & Kern, 2008). As of 2009, it was reported that students with EBD comprise 8% of all students with disabilities and the numbers are continuing to rise.

Cook and colleagues (2008) confirm and expand on this claim by reporting the children with EBD are at a greater risk for poor school adjustment, for engaging in delinquent behaviors, and for adult psychopathology. This often leads the family to seek mental health services in the community. Creating a more pleasant and successful academic career is important, as children with EBD experience less than desirable social and economic outcomes, higher rates of unemployment, criminality, substance abuse, and aberrant sexual behavior (Sacks & Kern, 2008). Often times, the mental health system and the school system engage in treatment programs for these students. In Pennsylvania, this is referred to as behavioral health rehabilitative services (BHRS).

Behavior Analysis & Therapy Partners (BATP) is a for-profit behavioral health agency whose clinicians serve a highly diverse population with respect to age (pre-school to elderly), diagnoses, presenting problems, and socio-economic status, including those with EBD. Depending on assignment, its BHRS division delivers treatment to children, many of whom have EBD, in the home, community, and/or school system. The BHRS are administered through a behavioral consulting process in which a

behavioral specialist consultant (BSC) works with a consultee (parent, teacher, or other socializing agent) to provide services to advance a formal problem-solving model that uses applied behavior analysis (ABA) intervention specification within a targeted behavior-ecology context (Bergan & Kratchowill, 1990). The BSC helps the child indirectly by affecting the consultee. Conversely, BATP offers the services of a mobile therapist (MT) and/or a therapeutic staff support (TSS) intervene in the child's environment directly. According to Cautilli, Rosenwasser, and Clarke (2000), the MT affects behavior change by using behavioral therapy with both the individual child and the family while the TSSis a direct-care staff person who affects behavior change by providing proactive behavioral management and emotional support to the child. Both the TSS and the MT follow the treatment plan written by the BSC.

BATP, like all BHRS, takes a family-focused approach in which both the families of the children and the children themselves are considered partners and experts with regards to the development and evaluation of services (Andersen-Butcher & Ashton, 2004). For BATP, this means the implementation of a parent training model and a use of siblings in the treatment, and the conjoing collaboration of the family, child, and treatment team on goal-setting. Rosen, Heckman, Carro, and Burchard (1994) found that youths who receive wraparound services appear to be satisfied with the services and are less likely to act out when they feel involved and feel that their contingency-oriented care is unconditional. Services often use behavioral interventions to increase parental sensitivity to the needs and function of children's behavior (Dunst and Kassow, 2008). In addition, Nordess (2005) found that wraparound services appears to adhere to the principles of individualized services, a family-driven approach, and unconditional care, consistent with BATP's approach to service delivery. Rosen and colleagues (1994) suggest that this is provided evidence for the legitimacy of the principles of wraparound.

Outpatient and school-based treatment programs have been shown to make statistically reliable and clinically significant improvements on symptom scales and to move to a less severe range of functioning (Cautilli, Harrington, Gillam, Denning, Helwig, Ettingoff, Valdes, & Angert, 2004; Karpenko, Owens, Evangelista, & Dodds, 2009; Mulick & Naugle, 2010; Wise, 2003) when pre- and post-treatment scales have been examined. Such comparisons provide a good starting point for the program evaluation of BHRS at BATP. The following analysis details the preliminary results of a select sample of such comparisons.

Method

Participants: To enter the program, children need to be between the ages of three and twenty-one and have a psychiatric diagnosis. For the purposes of this study, children who are diagnosed with any disorder on the Autism spectrum are excluded. In addition, children with developmental disabilities were only included if they have a primary diagnosis in the EBD category, such as anxiety, depression, oppositionality. For a detailed description of each child, please see Table 1.

Description of Personnel. BATP subscribes to a behavior-analytic orientation and service model. At BATP, BSCs are required to be master's level clinicians with an educational background in ABA; MTs are required to be master's level clinicians with an education background in counseling and therapy. TSS workers are required, by the state of Pennsylvania, to have a "Bachelor's degree in psychology, social work, counseling, sociology, education, criminal justice, or similar human service fields, with no previous work experience" (Commonwealth of Pennsylvania, 2006).[1]

[1] Other qualifications can be found in the MA Bulletins 01-01-05, 29-01-03, 33-01-03, 41-01-02, 48-01-02, 49-01-04, and 50-01-03

Training of Staff. Each staff member is provided with at least 15 hours of pre-service training and 40 hours of on-going training to be completed throughout the calendar year (Adkins-Ruff, Cautilli, Clarke, & Thomas, 2001; Cautilli & Rosenwasser, 2001; Clarke & Cautilli, 2001; Thomas & Cautilli, 2000; Weinberg, Cautilli, & Clarke, 2001). Weekly supervision is conducted by a board certified behavior analyst and Master's level clinicians receive monthly supervision conducted by a licensed psychologist who is also a board certified behavior analyst.

Interventions. Interventions are contingency oriented, designed to (1) eliminate antisocial and inappropriate behavioral patterns, (2) improve social relationships in the home and school milieus, and (3) increase social participation and engagement.

Evaluation of Children. At BATP, each child is evaluated on entry and every four months by a licensed psychologist. As part of the evaluation process, parents are given the Child Behavior Checklist (CBCL) to rate their child's behavioral problems. If the child is under the age of six years, the Child Behavior Checklist for Children Ages 1 ½ - 5 (CBCL/1.5-5) is administered; children and adolescents between the ages of 6 and 18 are administered the CBCL/6-18. For more information on the CBCL, please refer Achenbach & Rescorla (2000a) and Achenbach & Rescorla (2000b).

Analytic Methods. To evaluate the program, these authors used the reliable change scores. Reliable change is important to understanding the effectiveness of a treatment program and it minimizes the statistical effect that may be unrelated to clinical significance (Cautilli, et al., 2004; Eisen, Ramgamatjam. Sea;. & Spirp, 2007; Johnson, Dow, Lynch, & Hermann, 2006). Previous research (Jacobson, Roberts, Berns, &McGlinchey 1999; Jacobson, Follette, & Revenstorf, 1984; Jacobson & Truax, 1991) suggests a formula for calculating reliable change and reports that there are five possible outcomes stemming from the result of those calculations. For the purpose of this study recovery was sub-divided into two categories, "fully recovered" and "partially recovered." Fully recovered refers to scores that ended in the normal range and met the 1.96 reliable change score criteria. Partially recovered refers to scores that met the 1.96 reliable change score criteria and ended in the borderline range. "Unchanged" can be coded twice and refers to a score where neither criterion is met or where scores appear to be recovered or improved but do not show reliable change (Jacobson et. al, 1999). Regression occurs when the reliable change score is passed in the opposite direction (Jacobson et. al, 1999).

Procedure. Every BATP case – both open and closed – was reviewed for possible inclusion in this program review. For inclusion criteria, refer to the "Participants" section. Additionally, each child had to have been administered the CBCL on at least two separate occasions. The CBCL had to have been completed by the same rater.

The total number of cases that met the criteria was 16. The scores from the earliest and the most recent administration of the CBCL were collected. The scores were compared and the difference was observed. The difference was divided by the standard error of the measure obtained from the *Manual for the ASEBA Preschool Forms & Profiles* and the *Manual for the ASEBA School-Age Forms & Profiles* (Achenbach & Rescorla, 2000a; Achenbach & Rescorla, 2000b).

Using the formula Jacobson and colleagues (Jacobson & Truax, 1991; Jacobson, Follette, & Revenstorf, 1984) developed, the scores obtained from the most recent administration of the CBCL were subtracted from the first administration. Next, that result was divided by the standard error of the measure given by Achenback & Rescorla (2000a; 2000b). The scores were compared to ±1.96 to obtain reliable change at the 95% confidence interval (Jacobson, Roberts, Berns, & McGlinchey, 1999).

If any change occurred on normal scales, the results were omitted. If any clinical significant progress was observed on a scale originally in the clinical (C) or the borderline clinical (B) range, the

scare was coded as a +1. If any clinically significant regression was observed on a scale that ended in the C or the B range, it was coded as a -1. The case was considered a success if the net result was a positive number.

Treatment Integrity Checks. To check for treatment integrity, 75 treatment notes were drawn and reviewed at random. Treatment integrity refers to the notes mentioning the treatment goal as well as referencing at least one of the interventions as described in the treatment plan (Cautilli et. al, 2004).

Typical Interventions. The treatment plans show a family-centered approach to treatment and are written on a developmental level that the family can be full partners in plan creation; they use a functional assessment, including both direct and indirect measures as proposed by Cone (1978); and they represent a comprehensive target area (Cautilli, Riley-Tillman, & Thomas, 2001). Each objective contains five components: a target person, identification of target behavior, identification of conditions under which the behavior is to be displayed, criteria for acceptable performance, and a timeline for achievement (Alberto & Troutman, 1999; Deno & Jenkins, 1967; Mager, 1962).

Data

Descriptive Statistics. Of the 16 subjects observed, 14 (87.5%) were male. Six (37.5%) of the subjects were African American and seven (43.75%) were Caucasian. The remaining three (18.75%) were bi-racial or unspecified. At the first administration of the CBCL, the average age of the child was nine years, three months. At the last available administration of the CBCL, the average age of the child was ten years, zero months. The average number of days between the administrations of the CBCL was approximately 278. All (100%) children received an individualized treatment plan based on a functional assessment. All (100%) 16 children's treatment plans had a behavioral case formulation. Behavioral interventions were derived from evidence-based treatment practices and based on functional assessments for children with EBD. Interventions varied based on the child's need, but included token economies, response cost, social skills training, antecedent control strategies, and contingency management. Parents and other community-based support systems received training on these interventions so that the appropriate level of skill could be transferred to the home setting. Consultation also occurred with the teachers and various school staff on behaviorally interventions to modify and manage the child's behavioral challenges in school.

Examining the primary diagnoses, ten (62.5%) children were diagnosed with ADHD; four (25%) were diagnosed with ODD; one (6.25%) was diagnosed with adjustment disorder with mixed disturbances of conduct and emotion; and one (6.25%) was diagnosed with post-traumatic stress disorder (PTSD). Secondary diagnoses ranged from ADHD to Mixed-Receptive Language Disorder and are included in Table 1.

Table 1: Client Reliable Change (Both Positive and Negative) for Each Client

Identifying Information	*Ages (Between Administrations of the CBCL)*	*Days in Service (Between Administrations of the CBCL)*	*Improved Scales*	*Regressed Scales*	*Scales with No Change or Clinically Insignificant Change*	*Net Score*
Client 1 African American	8 year, 8 months – 9 years, 8 months	378	Social Competency (26-C, 40-N)	Social Problems (72-C, 82-C)	Attention Problems (70-C, 70-C)	+3

Female ADHD; Disruptive Behavior Disorder; Major Depressive Disorder (Mild); Specific Phobia (School); Mild MR (By History)			Total Competence (26-C, 35-C) Rule-Breaking Behavior (74-C, 71-C) Attention Deficit/Hyperactivity Problems (73-C, 70-C) Oppositional Defiant Problems (70-C, 67-B)	Internalizing Problems (50-N, 62-B)	Aggressive Behavior (75-C, 78-C) Externalizing Problems (75-C, 75-C) Total Problems (71-C, 72-C) Conduct Problems (79-C, 77-C)	
Client 2 Caucasian Male ADHD; ODD; R/O Bi-Polar Disorder; R/O Learning Disorder, NOS	10 years, 3 months – 10 years, 8 months	142	Social Competency (25-C, 32-B) Somatic Problems (65-B, 61-N)	Withdrawn / Depressed (66-B, 70-C) Thought Problems (58-N, 77-C) Rule-Breaking Behavior (76-C, 79-C) Internalizing Problems (60-B, 66-C) Affective Problems (63-N, 70-C) Oppositional Defiant Problems (66-B, 73-C)	School Competency (27-C, NC) Total Competence (25-C, NC) Attention Problems (64-N, 66-B) Aggressive Behavior (70-C, 75-C) Externalizing Problems (74-C, 77-C) Total Problems (70-C, 74-C) Conduct Problems	-4

					(83-C, 86-C)	
Client 3 African American Male ADHD; Disruptive Behavior Disorder, NOS	6 years, 5 months – 6 years, 11 months	207	School Competence (33-B, 40-N) Attention Problems (69-B, 66-B)	Social Competence (34-B, 28-C) Thought Problems (58-N, 70-C) Aggressive Behavior (68-B, 79-C) Attention Deficit-Hyperactivity Problems (72-C, 75-C) Oppositional Defiant Problems (66-B, 77-C)	Total Competence (35-C, 37-B) Withdrawn / Depressed (68-B, 68-B) Externalizing Problems (67-C, 72-C) Total Problems (65-C, 71-C) Conduct Problems (69-B, 71-C)	-3
Client 4 Caucasian Male ODD; R/O ADHD; Borderline Intellectual Functioning (Clinical Judgment)	13 years, 4 months – 13 years, 9 months	147	School Competence (30-C, 55-N) Total Competence (40-B, 46-N) Anxious/ Depressed (72-C, 57-N) Withdrawn/ Depressed (70-C, 63-N) Social Problems (72-C, 66-B) Attention Problems	Activities Competence (55-N, 34-B) Thought Problems (59-N, 66-B) Aggressive Behavior (76-C, 86-C) Oppositional Defiant Problems (71-C, 80-C)	Rule-Breaking Behavior (67-B, 66-B) Externalizing Problems (72-C, 75-C) Total Problems (72-C, 75-C) Affective Problems (66-B, 66-B)	+4

			(67-B, 61-N) Internalizing Problems (70-C, 61-B) Anxiety Problems (73-C, 62-N)		Attention Deficit-Hyperactivity Problems (68-B, 67-B) Conduct Problems (71-C, 69-B)	
Client 5 African American Male Adjustment Disorder with Mixed Disturbances of Conduct and Emotions	7 years, 3 months – 7 years, 7 months	118	Social Competence (34-B, 43-N) Anxious/Depressed (72-C, 59-N) Thought Problems (67-B, 61-N) Aggressive Behavior (76-C, 66-C) Affective Problems (70-C, 63-N) Oppositional Defiant Problems (73-C, 66-B)	Activities Competence (40-N, 30-C) Rule-Breaking Behavior (67-B, 70-C)	Total Competence (35-C, 34-C) Withdrawn / Depressed (68-B, 70-C) Internalizing Problems (70-C, 65-C) Externalizing Problems (73-C, 68-C) Total Problems (70-C, 65-C) Conduct Problems (70-C, 70-C)	+4
Client 6 African American Male ADHD; ODD;	8 years, 7 months – 9 years, 3 months	244	Activities Competence (33-B, 38-N) Attention Problems (71-C, 67-B)	Social Competence (39-N, 29-C) Total Competence (34-C, 28-	Externalizing Problems (71-C, 75-C) Total Problems (68-C, 73-	-10

Mood Disorder, NOS; R/O Conduct Disorder				C) Anxious/ Depressed (53-N, 66-B) Withdrawn/ Depressed (58-N, 68-B) Social Problems (62-N, 75-C) Thought Problems (64-N, 70-C) Rule-Breaking Behavior (64-N, 67-B) Aggressive Behavior (72-C, 83-C) Internalizing Problems (54-N, 66-C) Affective Problems (52-N, 65-B) Oppositional Defiant Problems (70-C, 73-C) Conduct Problems	C) Attention Deficit-Hyperactivity Problems (77-C, 77-C)	

				(69-B, 76-C)		
Client 7 Bi-Racial Male ODD; ADHD; Mixed Receptive-Expressive Language Disorder; Learning Disorder, NOS	9 years, 9 months – 10 years, 7 months	371	Withdrawn/ Depressed (68-B, 62-N) Social Problems (69-B, 50-N) Attention Problems (79-C, 55-N) Rule-Breaking Behavior (71-C, 51-N) Aggressive Behavior (73-C, 50-N) Internalizing Problems (66-C, 54-N) Externalizing Problems (73-C, 40-N) Total Problems (72-C, 48-N) Affective Problems (65-B, 56-N) Anxiety Problems (66-B, 50-N) Attention Deficit-Hyperactivity Problems (69-B, 50-N) Oppositional Defiant Problems (70-C, 50-N) Conduct Problems (74-C, 50-N)	Social Competence (37-N, 23-C) School Competence (27-C, 25-C)	Activities Competence (30-C, 31-N) Total Competence (26-C, 25-C)	+11

Client 8 Caucasian Male ODD	3 years, 7 months – 3 years, 11 months	146	Emotionally Reactive (69-B, 62-N) Anxious/Depressed (70-C, 59-N) Withdrawn (76-C, 60-N) Sleep Problems (67-B, 53-N) Aggressive Behavior (82-C, 59-N) Internalizing Problems (71-C, 60-B) Externalizing Problems (74-C, 58-N) Affective Problems (79-C, 67-B) Anxiety Problems (67-B, 50-N) Pervasive Developmental Problems (74-C, 66-B) Attention Deficit-Hyperactivity Problems (67-B, 54-N) Oppositional Defiant Problems (77-C, 59-N)		Total Problems (71-C, 58-N)	+12
Client 9 Caucasian	12 years, 3 months – 13 years, 4	401	Activities Competence (29-C, 40-N)	Somatic Complaints (67-B, 70-		+17

Male ADHD; ODD; Mixed Receptive-Expressive Language Disorder; Phonological Disorder	months		Social Competence (26-C, 35-B) School Competence (33-B, 39-N) Total Competence (23-C, 34-C) Anxious/Depressed (76-C, 54-N) Withdrawn/ Depressed (66-B, 50-N) Social Problems (79-C, 66-B) Thought Problems (80-C, 63-N) Attention Problems (76-C, 61-N) Rule-Breaking Behavior (66-B, 57-N) Aggressive Behavior (78-C, 58-N) Internalizing Problems (71-C, 58-N) Externalizing Problems (72-C, 58-N) Total Problems (78-C, 61-B) Affective Problems (77-C, 51-N)	C) Somatic Problems (68-B, 70-C)		

			Anxiety Problems (74-C, 58-N) Attention Deficit-Hyperactivity Problems (77-C, 68-B) Oppositional Defiant Problems (71-C, 55-N) Conduct Problems (69-B, 56-N)			
Client 10 African American Male PTSD; ODD; Mood Disorder, NOS; Bereavement; Learning Disorder, NOS	9 years, 3 months – 12 years, 0 months	871	Social Competence (34-B, 48-N) School Competence (24-C, 37-N) Withdrawn/ Depressed (70-C, 63-N) Thought Problems (74-C, 70-C) Attention Problems (75-C, 55-N) Rule-Breaking Behavior (80-C, 62-N) Aggressive Behavior (84-C, 60-N) Externalizing Problems (80-C, 61-B) Oppositional Defiant Problems (73-C, 58-N) Conduct Problems	Activities Competence (53-N, 28-C) Somatic Complaints (64-N, 67-B) Social Problems (53-N, 72-C) Anxiety Problems (55-N, 66-B) Somatic Problems (61-N, 68-B)	Total Competence (32-C, 31-C) Internalizing Problems (68-C, 65-C) Total Problems (75-C, 65-C) Affective Problems (76-C, 73-C)	+5

			(88-C, 64-N)			
Client 11 African American Female ADHD; R/O Mood Disorder	15 years, 4 months – 15 years, 9 months	155	Social Competence (35-B, 59-N) Total Competence (36-C, 51-N) Thought Problems (77-C, 70-C) Rule-Breaking Behavior (69-B, 64-N)	Anxious/ Depressed (51-N, 65-B) Withdrawn/ Depressed (54-N, 66-B) Social Problems (51-N, 73-C) Attention Problems (61-N, 66-B) Internalizing Problems (50-N, 66-C) Total Problems (65-C, 67-C) Affective Problems (60-N, 72-C) Anxiety Problems (51-N, 68-B) Attention Deficit-Hyperactivity Problems (63-N, 66-B)	Externalizing Problems (67-C, 61-B) Conduct Problems (68-B, 65-B)	-5
Client 12	8 years, 3 months – 8	211	Anxious / Depressed		Social Competence	+6

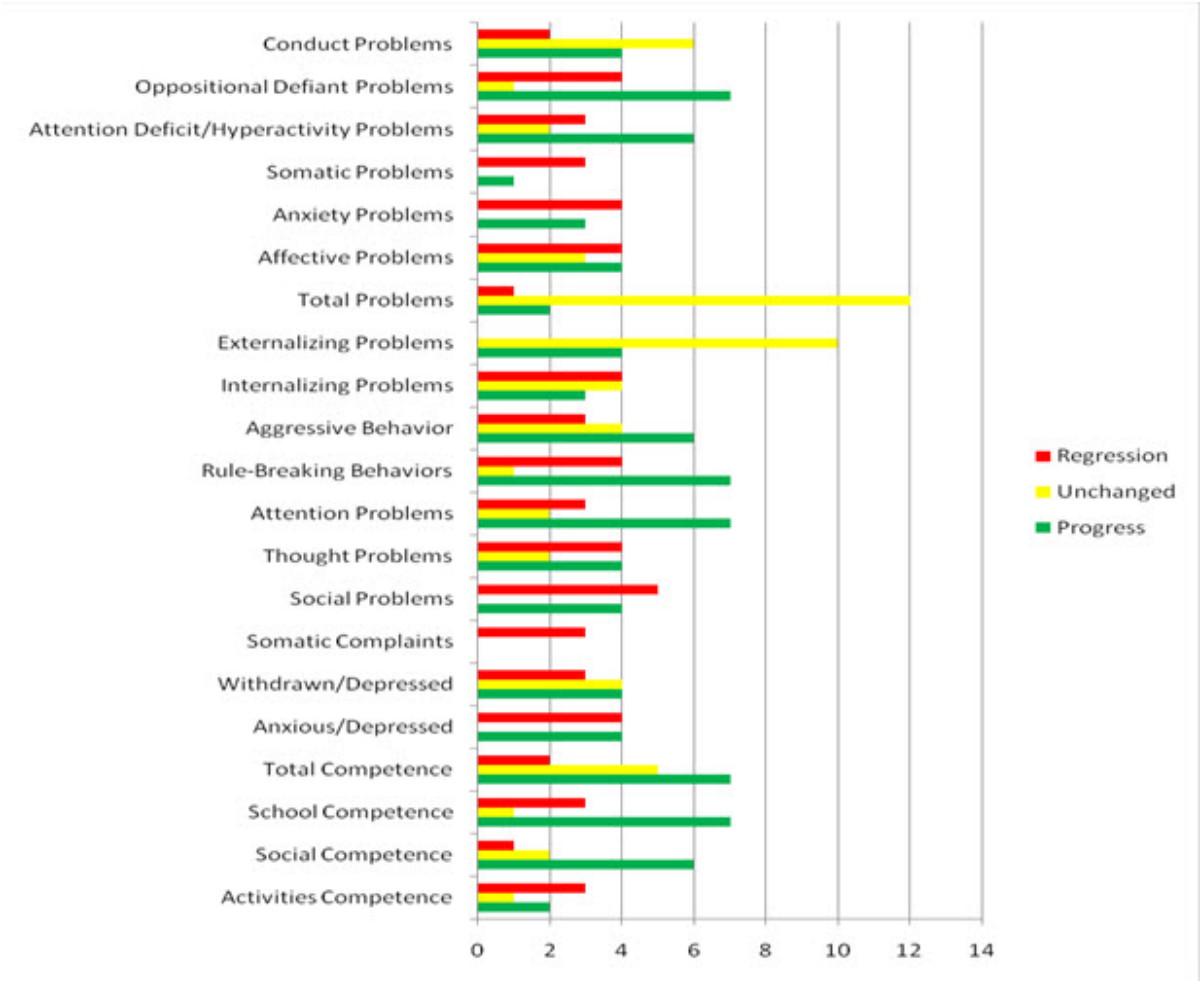
Bi-Racial Male ODD; ADHD	years, 9 months		(67-B, 59-N) Social Problems (70-C, 67-B) Rule-Breaking Behavior (73-C, 70-C) Aggressive Behavior (91-C, 75-C) Oppositional Defiant Problems (77-C, 66-B) Conduct Problems (80-C, 71-C)		(34-B, 34-B) Withdrawn/ Depressed (66-B, 68-B) Internalizing Problems (66-C, 63-B) Externalizing Problems (79-C, 73-C) Total Problems (72-C, 66-C)	
Client 13 Caucasian Male ADHD; ODD; Learning Disorder, NOS; OCD (Secondary to PANDAS); Tic Disorder (Secondary to PANDAS); Enuresis, Nocturnal	12 years, 5 months – 12 years, 7 months	43	School Competence (33-B, 37-N) Total Competence (38-B, 43-N) Affective Problems (66-B, 61-N)	Anxious/ Depressed (60-N, 66-B) Attention Problems (61-N, 67-B) Anxiety Problems (66-B, 71-C) Attention Deficit-Hyperactivity Problems (62-N, 70-C)	Thought Problems (72-C, 74-C) Aggressive Behavior (63-N, 66-B) Internalizing Problems (61-B, 61-B) Externalizing Problems (60-B, 63-B) Total Problems (64-C, 67-C)	-1
Client 14 Caucasian Male	7 years, 9 months – 8 years, 0 months	100	School Competence (27-C, 29-C) Total Competence	Anxious/ Depressed (67-B, 74-C)	Withdrawn/ Depressed (76-C, 76-C)	-6

ADHD; Adjustment Disorder; ODD			(36-C, 39-B) Attention Deficit/Hyperactivity Problems (75-C, 72-C)	Somatic Complaints (53-N, 68-B) Social Problems (62-N, 67-B) Attention Problems (71-C, 88-C) Rule-Breaking Behaviors (67-B, 74-C) Affective Problems (65-B, 70-C) Anxiety Problems (65-B, 72-C) Somatic Problems (50-N, 70-C) Conduct Problems (65-B, 70-C)	Thought Problems (70-C, 73-C) Aggressive Behavior (66-B, 65-B) Internalizing Problems (70-C, 75-C) Externalizing Problems (67-C, 71-C) Total Problems (72-C, 75-C) Oppositional Defiant Problems (70-C, 70-C)	
Client 15 Caucasian Male ADHD; R/O Learning Disorder	6 years, 11 months – 7 years, 8 months	238	Attention Problems (71-C, 67-B) Attention Deficit-Hyperactivity Problems (72-C, 69-B)	Total Competence (49-N, 39-B)	Total Problems (56-N, 61-B)	+1

Client 16 African American Male ADHD; ODD; Learning Disorder, NOS	8 years, 0 months – 9 years, 10 months	673	Social Competence (34-B, 45-N) Total Competence (35-C, 44-N) Thought Problems (67-B, 58-N) Attention Problems (79-C, 66-B) Rule-Breaking Behavior (73-C, 67-B) Aggressive Behavior (84-C, 65-B) Externalizing Problems (74-C, 66-C) Attention Deficit/Hyperactivity Problems (80-C, 62-N) Oppositional Defiant Problems (80-C, 62-N) Conduct Problems (75-C, 63-N)		School Competence (27-C, 27-C) Total Problems (72-C, 60-B) Affective Problems (55-B, 56-N)	+10

TABLE 2, Next Page!

Table 2: Clinically Significant Change Based on CBCL Scales



Results

Using the reliable change index, the authors found that ten of the sixteen participants (62.5%) make clinically significant progress over the course of the average 278 days. On the subscales, excluding the composite scores, there were a potential of 270 possible scale changes of which 174 scales changed across all subjects (64.4%). Looking at those subscales, 89 scales clinically improved (51.1% scale improvement) and 56 scales clinically regressed (31.1%). The remainder of the scales showed no clinically significant change. Of the composite scales, there was a potential for 60 composite changes. Fifty-eight changes actually occurred. Of those 58 changes, 18 were significantly improved (31%), 7 clinically regressed (12.1%), and 33 showed no clinically significant change (56.9%). Examining the children who improved compared to those who regressed, the children improved, on average, on 7.3 net scales. Those who regressed did so, on average, on 4.8 net scales.

Of the 232 scales showing pathology observed in this present study, 93 (40.0%) show recovery. Of those 93, 71 (76.3%) showed a full recovery and 22 (23.7%) were partially recovered.

On the individual scales, more children progressed than regressed with regards to the following: conduct problems, oppositional defiant problems, attention deficit/hyperactivity problems, externalizing problems, aggressive behavior, rule-breaking behavior, attention problems, withdrawn/depressed symptoms, total competence, school competence, and school competence. The scales for conduct problems, thought problems, and externalizing problems, though, largely remained unchanged.

Regression occurred more often than not with regards to internalizing problems, social problems, somatic complaints, and activities competence. Because only one child in this present study was administered the CBCL/1.5-5, results on that standardized assessment are limited to Client 8. Reliable change on those scales can be found in Table 1.

With regards to gender, nine (approximately 64%) of the males showed progress and one (50%) of the females showed progress. With regards to race, four of the seven (approximately 57%) African American children showed progress and four of the seven (approximately 57%) Caucasian children showed progress. Both (100%) of the bi-racial children showed progress. With regards primary diagnoses, four of the ten (40%) diagnosed with ADHD showed clinically significant progress; all of the children diagnosed with ODD showed clinically significant progress; both the child diagnosed with adjustment disorder with mixed disturbance of conduct and emotion and the child diagnosed with PTSD made clinically significant progress. It is important to note that these statistics only apply to primary diagnoses. Most children (87.5%) had co-morbid diagnoses.

When the treatment integrity was checked, 23 (30.7%) were BSC progress notes, 11 (14.7%) were MT progress notes, and 41 (54.7%) were TSS progress notes. Seventy-one (94.6%) directly reflected the goals and interventions written by the BSC in the treatment plan. It is clear that treatment integrity was maintained and it is reasonable to attribute at least part of reliable change to the BHRS program.

Discussion

This was the first evaluation of BHRS for children with EBD published to our knowledge. It is clear from our data that children can make substantial gains from the program. Ten of the sixteen participants in this study made clinically significant progress. The average number of days between the pre- and post-scores was 278 days. It appears that 62.5% of the children show progress within one year. Notwithstanding, it does appear that the longer a child is in the system, the better their outcomes are. Race and diagnosis does not appear to matter with regards to success in the program. Regarding subscale progress, 51.1% show improvement to the 31.1% that regress. When examining the composite scales, 31% improved while 12.1% regressed. Regression should be closely monitored by supervisors so that the BSC is afforded the opportunity to revise their treatment plan under the guidance of those with, potentially, more expertise and experience to design more effective interventions. Forty percent of the scales observed show a recovery, 76.3% of which show a full recovery. Finally, it appears that once progress is obtained on a particular subscale, it is easier for change to occur on the subsequent scales. This provides evidence that targeting the appropriate behavior can lead to a wider range of behavior change.

Specific to BATP, it appears that the staff needs additional training and supervision with regards to internalizing problems, social problems, somatic complaints, and activities competence. There is a behavior model of depression treatment outlined by Lewinsohn, Clarke, and Hops (1990) in which a functional analysis of depression is conducted. Currently, the staff is being trained in the model. For the supervisors at BATP, this means implementing more training programs in this model.

While the method of analysis of treatment integrity used in this report has problems with it, overall, the treatment integrity is high. Future studies need to focus on a better by which of assessing treatment integrity, such as direct observation.

While behavior analytic interventions have a strong research based supporting them for the treatment of EBD diagnoses (O'Donohue & Ferguson, 2006), this is the first study that shows that they can be effectively in Pennsylvania's BHRS format. This study can be looked as the first step in developing programs for children with EBD. Eight percent of the student population suffers from an EBD while only one percent receives additional services (Jull, 2008). In Pennsylvania, BHRS is one of the options teachers and parents should consider as promising for the treatment of EBD. Still, much more research needs to be done. Problems such as poor school adjustment, delinquent behaviors, adult psychopathology, disruptions to the academic process, impediments to social functioning, unsafe environments, lower grades, failed courses, and high drop-out rates directly affect the future. They affect social and economic outcomes, unemployment, criminality, substance abuse, and aberrant sexual behavior (Sacks & Kerns, 2008). Interventions need to occur early in the child's development to improve life for the future.

Limitations to this study included a small sample size, one instrument upon which to base change, no control group, no randomization, and its inherent A-B experimental design. With the small sample size in this present study, it was difficult to obtain any statistical significance with regards to change. It was for this reason that the authors chose to rely on clinical significance. Also, because this study was a program evaluation for BATP, no control group was included to refute the null hypothesis that BHRS has no effect on behavioral change. In these types of studies, the instrument's stander error of the measure serves as the control for how effective change is (Jacobson, Follette, & Revenstorf, 1984). Since the parents are not program staff, they represent an independent evaluation of the program which is a strength of this evaluation process. In addition, staying away from statistical change and talking about the percentage of children making improvement is much more customer friendly for parents of children who seeking services. Ideally, we envision a world in which every parent entering a child know the percentage of children progressing to normal levels based on the statistical instruments used in that clinic. In the future, the authors would like to eliminate these limitations by including more participants which is directly related to the cases available for services in Montgomery County, Pennsylvania. Also, BATP evaluators have begun to use more behavior assessment instruments in the evaluation process. We believe that this process will give a more in depth look at the specific progress our children are making and lead to continuous improvement through the feedback to the staff of the child's areas of progress during the supervisory process. The focus of this study lay predominately in problem behaviors and an increase in adaptive behaviors was not included. Future, follow-up studies hope to include this facet of an improved quality of life. Finally, the authors would like to include a control group in the future to prove that BHRS provides causality for behavioral change.

References

Achenbach, T.M. & Rescorla, L.A. (2000a). *Manual for the ASEBA Preschool Forms & Profiles.* Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families.

Achenbach, T.M. & Rescorla, L.A. (2000b). *Manual for the ASEBA School-Age Forms & Profiles.* Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families.

Alberto, P.A. & Troutman, A.C. (1999). *Applied Behavior Analysis for Teachers (5th Ed.).*Upper Saddle

River, NJ: Merril/Prentice-Hall, Inc.

Anderson-Butcher, D. & Ashton, D. (2004). Innovative models of collaboration to serve children, youth, families, and communities. *Children & Schools*, 26(1), 39-53.

Adkins-Ruff, T, Cautilli, J.D., Clarke, K., and Thomas, C.A. (2001). Over the counter service versus training and treatment efficacy: What will behavioral health rehabilitation (wrap-around) programs strive to be? *The Behavior Analyst Today*, 2(1), 45-54.

Bergan, J.R. & Kratchowill, T.R. (1990). *Behavioral Consultation and Therapy.* NY: Plenum Press.

Cautilli, J., Harrington, N., Gillam, E.V., Denning, J., Helwig, I., Ettingoff, A., Valdes, A., & Angert, A. (2004). Do children with multiple patterns of problem behavior improve? The effectiveness of an intensive bio-behaviorally oriented school-based behavioral health program. *Journal of Early and Intensive Behavioral Intervention*, 1(1), 74-93.

Cautilli, J., Riley-Tillman, T.C., & Thomas, C.A. (2001). The consulting behavior analyst: Reviewing treatment plans. *The Behavior Analyst Today*, 2(3), 267-274.

Cautilli, J. & Rosenwasser, B. (2000). Best practices for the administration of behavioral health rehabilitation services (wrap around) in Pennsylvania: Six basic problems and their solutions. *The Behavior Analyst Today*, 1(2), 42-56.

Cautilli, J. & Rosenwasser, B. (2001). Revamping therapeutic staff support practices. *The Behavior Analyst Today*, 2(2), 155-159.

Clarke, K. & Cautilli, J.D. (2001). What behavioral consultants and parents need to know: Training paraprofessionals to work in home-based programs. *The Behavior Analyst Today*, 2(1), 55-57.

Commonwealth of Pennsylvania, Department of Public Welfare (2001). *Revision to policies and procedures relating to mobile therapy, behavioral specialist consultant and therapeutic staff support services* (Medical Assistance Bulletin No. 01-01-05, 29-01-03, 33-01-03, 41-01-02, 48-01-02, 49-01-04, 50-01-03). Harrisburg, PA: Commonwealth of Pennsylvania.

Cone, J.D. (1978). The behavioral assessment grid (BAG): A conceptual framework and taxonomy. *Behavior Therapy*, 9, 882-888.

Cook, C.R., Gresham, F.M., Kern, L., Barreras, R.B., Thorton, S., & Crews, S.D. (2008). Social skills training for secondary students with emotional and/or behavioral disorders. *Journal of Emotional and Behavioral Disorders*, 16(3), 131-144

Deno, S. & Jenkins, D. (1967). *Evaluating preplanning curriculum objectives.* Philadelphia: Research for Better Schools.

Dunst, C.J. & Kassow, D.Z. (2008). Caregiver sensitivity, contingent social responsiveness, and secure infant attachment. *Journal of Early and Intensive Behavioral Intervention*, 5(1), 40-56.

Eisen, S.V., Ranganathan, G., Seal, P., & Spirp III, A. (2007). Measuring clinically meaningful change following mental health treatment. *The Journal of Behavioral Health Services & Research*, 34(3), 272-289.

Jacobson, N.S., Follette, W.C., & Revenstorf, D. (1984). Toward a standard definition of clinically significant change. *Behavior Therapy,* 17, 308-311.

Jacobson, N.S., Roberts, L.J., Berns, S.B., & McGlichey, J.B. (1999). Methods for defining and determining the clinical significane of treatment effects: Description, application, and alternatives. *Journal of Consulting and Clinical Psychology,* 67, 300-307.

Jacobson, N.S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology,* 59, 12-19. Johnson, E.K., Dow, C., Lynch, R.T., & Hermann, B.P. (2006). Measuring clinical significance in rehabilitation research. *Rehabilitation Counseling Bulletin*, 50(1), 35-45.

Jull, S.K. (2008). Emotional and behavioural difficulties (EBD): The special educational need justifying exclusion. *Journal of Research in Special Educational Needs,* 8(1), 13-18.

Kanter, J.W., Cautilli, J.D., Busch, A.M., & Baruch, D.E. (2005). Toward a comprehensive functional analysis of depressive behavior: Five environmental factors and a possible sixth and seventh. *The Behavior Analyst Today,* 6(1), 65-81.

Karpenko, V., Owens, J.S., Evangelista, N.M., & Dodds, C. (2009). Clinically significant symptom change in children with attention deficit/hyperactivity disorder: Does it correspond with reliable improvement in functioning. *Journal of Clinical Psychology,* 65(1), 76-93.

Lewinsohn, P.M., Clarke, G.N., & Hops, H. (1990). Cognitive-behavioral treatment for depressed adolescents. *Behavior Therapy,* 21(4), 385-401.

Manger, R.F. (1962). *Preparing instructional objectives.* Palo Alto: Fearon Publishers.

Mulick, P.S. & Naugle, A.E. (2010). Behavioral activation in the treatment of comorbid posttraumatic stress disorder and major depressive disorder. *International Journal of Behavioral Consultation and Therapy,* 5(3&4), 330-350.

Nordess, P.D. (2005). A comparison of school-based and community-based adherence to wraparound during family planning meetings. *Education and Treatment of Children,* 28(3), 308-320.

O'Donohue, W. & Ferguson, K.E. (2006). Evidence-based practice in psychology and behavior analysis. *The Behavior Analyst Today*, 7(3), 335-350.

Rosen, L.D., Heckman, T., Carro, M.G., Burchard, J.D. (1994). Satisfaction, involvement, and unconditional care: The perceptions of children and adolescents receiving wraparound services. *Journal of Child and Family Studies,* 3(1), 55-67.

Sacks, G. & Kern, L. (2008). A comparison of quality of life variables for students with emotional and behavioral disorder and students without disabilities. *Journal of Behavioral Education,* 17, 111-127.

Thomas, C.A. & Cautilli, J.D. (2000). Analyzing and management of three levels of behavioral health rehabilitation services (wrap around) for children: Building order out of chaos. *The Behavior Analyst Today,* 1(4), 76-81.

Weinberg, M., Cautilli, J., & Clarke, K. (2001). Successful management of EPSDT funded community-

based behavioral health rehabilitation services for children (wrap around): What OBH has to offer. *The Behavior Analyst Today*, 2(2), 150-154.

Wise, E.A. (2003). Empirical validation of a mental health intensive outpatient program in a private practice setting. *American Journal of Orthopsychiatry*, 73(4), 405-410.

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