

A new model for in-home and in-school behavioral treatment of children, especially those with autism spectrum disorders

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Abstract

Behavioral Health Rehabilitation Services (BHRS) are “covered services” under Medicaid that have been used to treat children and adolescents with Autism Spectrum Disorders (ASD) in their homes, schools and communities in Pennsylvania since 1992 pursuant to §1396(d)(r)(5) of the Social Security Act. They are included among the mandatory services within the Affordable Care Act. The present paper summarizes two studies that examined the efficacy of the *Effective Treatment in a Wraparound Cup*[®] (ET) model of BHRS that combines Applied Behavior Analysis (ABA) practices with Full Fidelity Wraparound principles to attenuate behavioral issues in children and adolescents, including those with Autism Spectrum Disorders (ASD). Previous independent researchers (University of North Carolina at Chapel Hill, 2007; Thomas Jefferson University, 2012) found that a statistically significant association existed between the implementation of the ET model of BHRS in children treated for four months and twelve months, respectively. Children with ASD have received BHRS via this model from staff of the Institute for Behavior Change since 1996 through the implementation of individualized treatment plans. Parents completed weekly evaluations of their child’s progress utilizing a Parent Report of Progress (PRP) which is a criterion-referenced measure of treatment efficacy. Analyses of 246 individualized treatment modules in the first study, and 165 individual treatment modules in the second study revealed significant overall amelioration of autism symptoms via the ET model of BHRS. These findings suggest that BHRS treatment which incorporates ABA practices and Full Fidelity Wraparound principles may be effective in attenuating behavioral symptoms in children, especially those with Autism Spectrum Disorders.

Keywords

autism spectrum disorder, BHRS, wraparound

Introduction

According to the Centers for Disease Control and Prevention, given the persistent escalation of the incidence of Autism Spectrum Disorders (ASD) over the past decade, at least one in 68 children in the US (1 in 42 boys) now have Autism Spectrum Disorders (Autism and Developmental Disabilities Monitoring Network Surveillance Year 2010). Autism is characterized by deficits in the ability to engage in give-and-take social interactions with other people (social reciprocity), a tendency to be preoccupied with stimulus properties of objects rather than their functional or imaginary uses, and varying levels of withdrawal and disenfranchisement from the opportunities for work, play and enjoyment that most people experience, among other symptoms (American Psychiatric Association, 2013).

The National Academy of Sciences, in an exhaustive survey of Autism treatment modalities, emphasized that treatment should include a minimum of 25 hours per week of intensive, individualized care tailored to each child's specific needs and that treatment is most effective when instituted as early as possible following diagnosis (Committee on Educational Interventions for Children with Autism, 2001). More recent research has also suggested that behavioral intervention at an early age is the most promising method of ameliorating autism symptoms, with 20-40 hours of treatment per week recommended (Matson & Smith, 2008). The American Academy of Pediatrics announced comparable findings (Myers SM & Johnson CP, 2007) and corroborated them in a publication summarizing definitive findings about Autism and its treatment (Rosenblatt, A. I. and Carbone, P. S. (Eds.), 2013).

BHRS was identified as the most efficacious modality in the treatment of children with ASD in Pennsylvania (Stanley Mrozowski, formerly Director of the Children's Committee, 2011). Nevertheless, relatively little research has been conducted on BHRS due to the inherent heterogeneity that exists in BHRS delivery models; by its very nature, each child's BHRS treatment plan is different, and organizations differ in their approaches to BHRS delivery. Despite the inherent pitfalls in studying BHRS, a small number of studies have been done that point to the potential efficacy of BHRS. For example, an investigation found that BHRS implemented in a home and school setting ameliorated symptom severity in children with emotional and behavioral disorders (Thoder, Hesky & Cautilli, 2010). Of the 16 children treated in the study (14 males, mean age = 10.3 years), ten (62.9%) displayed clinically significant improvements within one calendar year; using the Child Behavior Checklist (Goodman & Scott, 1999), researchers found that across the sample 51% of scales displayed improvement, 31% showed regression, and 18% remained unchanged.

Despite the complications of evaluating a program using a heterogeneous treatment modality, other fields of study are producing methods for examining evidenced-based practices through single-subject research. In special education research, educational tools are evaluated utilizing single-subject research, because it documents experimental control, and can subsequently be used to establish evidence-based practices (Shavelson & Towne, 2002). Single-subject research methodology, as outlined by Horner et al. (2005), is experimental, with each participant acting as his or her own control, with performance ratings compared before and after intervention, consisting of operational definitions of participants, settings, and measures utilized to determine factors such as a specific disability (e.g. autism-spectrum disorder). Utilizing the aforementioned means of experimental design and evaluation, it is clear that BHR services and treatment models, and the ET model of BHRS specifically, can be established as an evidence based, efficacious practice.

Behavioral Health Rehabilitation Services (BHRS)

BHRS models of service delivery revolve around treatment plans that are developed collaboratively with input from the child, family, other adult caregivers, BHRS providers and other treatment professionals involved with the child. In most models of BHRS, treatment is rendered under the auspices of a Community Mental Health Center or otherwise overseen by a Psychiatrist and the implementation of wraparound principles varies.

The *Effective Treatment in a Wraparound Cup*[®] (ET) model of BHRS examined in the two present studies was created in 1981 by the Founder and Executive Director of the Institute for Behavior Change, licensed psychologist and certified school psychologist Steven Kossor (Appendix H).

Independent researchers at the University of North Carolina at Chapel Hill (UNC, 2007, Appendix E) and at Thomas Jefferson University (TJU, 2010, Appendix F) concluded that exposure to the ET model of BHRS as implemented by the staff of the Institute for Behavior Change had a statistically significant association with reduction of physical aggression, lack of environmental safety, noncompliance with adult prompts, communication deficits and socialization deficits in children. The study by UNC researchers measured change in a four-month period; the study by a researcher at TJU measured change in a one-year period.

The ET model of BHRS integrates ABA practices and Full Fidelity Wraparound principles. The Treatment Team includes a licensed psychologist, a Masters-level Behavior Specialist Consultant (BSC) and/or a Mobile Therapist (MT) who operate under the direct supervision of the licensed psychologist, and a Bachelors-level Therapeutic Staff Support (TSS) provider who is supervised weekly by a Masters-level mental health professional. The scholastic requirements and treatment roles for BHRS providers are as follows:

- Licensed psychologists are “licensed practitioners of the healing arts” in Pennsylvania and thus can prescribe BHRS and supervise its delivery by persons under their scope of practice (PA Administrative Code of 1929, Licensed Psychologist Practice Act, 1972). Licensed psychologists who supervise BHRS providers must have expertise in treating mental illnesses in children.
- A Behavior Specialist Consultant (BSC) is a Master’s level clinician. BSCs are the lead clinician on most children’s Treatment Teams. In the ET model of BHRS, all BSC providers work directly under the supervision and scope of practice of licensed professional psychologists and receive between one and four hours of face-to-face supervision each week. The BSC providers convene and moderate meetings between the treatment team members, participate in periodic evaluations of the child, and draft written treatment plans that are reviewed by the licensed psychologist. BSCs participate in the evaluation process and complete draft evaluations that provide diagnoses, treatment recommendations and all of the documentation necessary with which to deliver the treatment program to the child and monitor its progress.
- Mobile Therapists (MTs) are Master’s level clinicians who also work directly under the supervision of a licensed psychologist. MTs provide counseling to the child in both the home and school setting. Additionally, they can meet with the child’s siblings, peers, parents/guardians, teachers and other adults involved in the child’s life in an advisory role to assist them in better appreciating the child’s strengths and understanding the child’s needs more compassionately, to promote a healthier self-image in the child and to enhance the quality of the child’s interpersonal relationships.
- Therapeutic Staff Support (TSS) providers are Bachelor’s level mental health professionals who provide one-to-one behavioral interventions in accordance with the child’s BHRS Treatment Plan in the home, school and community. TSS providers deliver intensive, individualized 1:1 behavioral support to the child, typically between five and 35 hours per week. TSS responsibilities include monitoring and recording the child’s behavior and implementing treatment as described in the child’s treatment plan. TSS providers are not permitted to physically restrain or administer medication to the child, and do not provide transportation, academic instruction or physical care.

Treatments Used within the ET model of BHRS

BHRS treatment programs typically incorporate a wide variety of treatment techniques for children with ASD, concentrating on behavioral intervention procedures. Treatments are selected based on the child's individual needs, with specific attention paid to using techniques that are ecologically valid to the setting that they will be delivered in. Applied Behavior Analysis (ABA) practices (Appendix G) have been widely recognized as “evidence based practices,” especially in the treatment of autism symptoms in children. Likewise, “full-fidelity wraparound” has also been widely considered to be an “evidence based practice.” Thus, it is reasonable to conclude that the combination of these two elements within any BHRS delivery model would improve its effectiveness in the treatment of behavioral symptoms in children, especially those with Autism Spectrum Disorders. That concept was the genesis of the ET model of BHRS. Evidence-based kernels as “fundamental units of behavioral influence” (Embry & Biglan, 2008) have been fully integrated into the ET model of BHRS since 2014.

Early Intensive Behavioral Intervention (EIBI) has emerged as one of the leading treatment modalities used to address behavioral issues in children with ASD. As the childhood application of Applied Behavior Analysis for children with ASD, EIBI is an intensive, behavioral paradigm that is used to address all areas of behavioral impairment (Granpeesheh, Tarbox & Dixon, 2009). Treatment is initiated early in the child's life (ideally before the age of 5), and is designed to be a long-term (2+ years) intervention where 1 to 1 work takes place for upwards of 40 hours per week in the home (Reichow & Wolery, 2009; Granpeesheh, Tarbox & Dixon, 2009).

EIBI includes four central teaching procedures, each of which is used to facilitate behavioral changes in the child: prompting, fading, shaping, and chaining (Granpeesheh, Tarbox & Dixon, 2009). Prompting involves the therapist presenting a cue to the child to assist them in remembering to perform a specific behavior. When the child completes the behavior, verbal or material reinforcement is provided. For example, if the therapist wants the child to verbalize a gesture of thanks, they may prompt the child with a statement such as “*What do we say when someone gives something to you?*” After repeated successes with prompting, the therapist “fades” the prompts by systematically diminishing its usage; this is done to reduce the child's reliance on prompts. With fading, the therapist continues to provide reinforcement for desired behavior despite the prompts being absent.

Shaping and chaining are both used to teach the child more complex behaviors. Shaping involves reinforcing successive, closer approximations of the target behavior until the child performs the desired action correctly. For example, if the desired behavior is having the child correctly make their bed, the child is reinforced for each instance that they improve their bed-making skills. Conversely, chaining involves the therapist breaking down the complex behavior into simpler component parts, reinforcing each successively until the child can complete the task. In the preceding bed-making example, the child would be reinforced for tucking in their sheets, placing the pillows in the correct place, etc.

Among the many treatment modalities used to treat children with ASD, Applied Behavior Analysis (ABA) has emerged as a widely endorsed set of intervention principles. ABA principles include the creation and periodic updating of a treatment plan containing behavioral and objective terminology describing the symptoms to be addressed, techniques to be used, personnel and specific outcome expectations. Treatment is implemented by trained and supervised professionals, while outcome

data is being collected on a frequent and ongoing basis. The data is used to inform and improve the quality of the treatment being provided, as well as modifying the treatment plan as needed. Specific applications of ABA principles have included Discrete Trial Training (Lovaas & Coegel, 1972) and a variety of other treatment approaches that implement behavior modification principles of learning and motivation (reinforcing or rewarding desired behavior while responding strategically to undesired or aberrant behavior so that its frequency and intensity diminished over time).

The Current Studies – 2013 and 2016

This investigation seeks to better understand the utility of the ET model of BHRS delivery by examining its efficacy in treating a specific population: children and adolescents under the age of 18 diagnosed with an Autism Spectrum Disorder. Specifically, the two present studies examine the efficacy of a BHRS treatment model that combines the practices and principles of two widely recognized evidence based practices (“Applied Behavior Analysis” and “Full Fidelity Wraparound”) to deliver BSC, MT, and TSS services to individuals with ASD.

The current studies hypothesize that treatment rendered to children with ASD utilizing the ET model of BHRS will ameliorate symptoms of their behavioral health diagnosis across five treatment domains, namely physical aggression, lack of safety awareness, socialization deficits, communication deficits and non-compliance. Furthermore, it is hypothesized that there will be a significant difference in reported target behavior frequency and duration from the baseline to outcome periods of treatment, across demographic variables (race, gender, income level).

Methods

Participants

A sample of 82 children who met criteria for a diagnosis on the autism spectrum (as outlined in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth and Fifth Editions*) were enrolled in BHRS during the given data collection period. Their participation and consent was determined through the initial authorization to provide treatment signed by the child’s parent/guardian, if the child was under the age of 14 or declared mentally incompetent, at the time of the initial behavioral intake and evaluation. If the child was over the age of 14, treatment and subsequent participation in the data collection was authorized through the consent of the child. All necessary demographic information was collected and behavioral goal domains were selected prior to the start of treatment, typically obtained by a BSC using a referral or intake questionnaire.

All subjects were children residing in one of four counties in Eastern Pennsylvania: Montgomery, Delaware, Philadelphia, or Chester Counties. Subjects were either past or current clients of the Network for Behavior Change, a private psychology group practice that delivers BHRS treatment, including TSS, MT, and BSC services to children, including those with ASD.

Measures

The primary research materials utilized in this study were two comprehensive forms filled out and updated by treatment team members throughout the child’s treatment period. First, demographic information was collected by a BSC using initial referral and intake forms. A parent/guardian of

each child reported information based on the child's sex, race, age, household income level, and initial reports of areas of behavioral symptoms.

In order to determine behavioral measures and outcomes with respect to each child's individualized treatment plan, a weekly Parent Report of Progress (PRP) was used (Appendix A). The PRP was developed as a measurement tool by licensed psychologist, Steven Kossor, with the dual purpose of recording and tracking client behavioral data and creating an opportunity for weekly dialogue between treatment providers and the parents/caregivers of children receiving treatment so that a reliable and valid measurement of treatment progress could be obtained from the parent of the child receiving treatment. Containing up to thirteen weeks of data collection, the PRP is designed to obtain weekly ratings from the child's parent/caregiver, on a 1 to 10 Likert scale, regarding the frequency and severity of the child's presentation of target behavior for each of their three current treatment goal domains (drawn from five possible domains: physical aggression, communication, socialization, non-compliance, and safety awareness).

Prior to enrollment into treatment, the empirically validated Childhood Autism Rating Scale – second edition (CARS-2) was also administered to facilitate the diagnosis of ASD (Garfin, McCallon & Cox, 1988). This measure was also repeated at Quarterly intervals (as a part of BHRS reauthorization) with the final measure taken within three months or less prior to discharge in most cases. Treatment providers also completed daily encounter forms ("Progress Notes") documenting the child's behavior and their interface with the child, and these were compared with PRP responses to maximize the reliability and validity of both staff encounter data and PRP data. When discrepancies were noted, these were discussed with both parties in order to improve their understanding of behavioral treatment components and expectations.

Procedure

Subjects were introduced to the provider organization when a parent/guardian initiated contact via a Referral Form (Appendix B), seeking treatment for behavioral issues associated with their child's referral diagnosis of ASD. After a brief phone screening where Medicaid eligibility was determined, a BSC was assigned to conduct an intake assessment. If BHRS appeared to be indicated, subjects were evaluated by a licensed psychologist who conducted a Life-Domain Bio-Psycho-Social evaluation (Appendix C) with input from the BSC, the child's parent (and the child's teacher if BHRS appeared to be necessary in the school), measuring the subject's strengths, weaknesses and needs in accordance with standards established by the Pennsylvania Department of Public Welfare (Hodas, G. 2001, Pennsylvania Department of Public Welfare).

Immediately following the completion of the child's evaluation, the parents/guardians, licensed psychologist, and BSC assigned to the case met to finalize an initial treatment plan and to assure parental understanding and intent to collaborate with the BHRS process. A BHRS description form (Appendix D) was presented to the parents of the child for their review and approval prior to the implementation of BHRS; if the child was age 14 or older, the child's consent was similarly obtained. Each child's treatment plan consisted of operationally defined target behaviors and operationally defined replacement behaviors paired with explicitly defined intervention methods (specifying the exact procedure to be used, by whom, when, and where). A Crisis Intervention Plan, Transition Plan (to low-cost or no-cost alternatives to BHRS), Titration Plan (to reduce or eliminate Bachelors-level TSS service) and a Discharge Plan were also developed before treatment commenced.

Treatment plans incorporated the principles of ABA, Full Fidelity Wraparound, elements of the Floortime approach, Discrete Trial Training (Dillenburger and Keenan, 2009; Lovaas, 1987; Pajareya and Nopmaneejumrulers, 2011; Strain and Schwartz, 2001; Tsiouri et al., 2012), Intensive Behavioral Treatment (Kossor, 1999) and other interventions as determined to be necessary by the licensed psychologist. Three behavioral domains were identified for intervention in a projected four-month treatment period, chosen from five potential domains: physical aggression, lack of environmental safety, noncompliance with adult prompts, communication deficits and socialization deficits.

Each subject received a prescribed combination of services (BSC, MT, and TSS), delivered weekly as prescribed for a varying number of hours. The BSC met with the family (and school officials if necessary) on a weekly basis to monitor treatment progress and MT or TSS service delivery. During their weekly meeting, the BSC engaged the subject's parent/guardian in a consultation, during which the PRP was administered, in person or via telephone. The operational definition of the child's target behavior was discussed with the parent. For example, the "physical aggression" target behavior domain might be operationally defined as "hitting, kicking and spitting" for an individual child. The parent was then asked to rate the frequency and severity, for the given calendar week, of the child's "hitting, kicking and spitting" on a Likert scale from 1 to 10, using five benchmarks that facilitate rapid and accurate assessment on a continuum where 10 is a "constant" frequency of the target behavior. A rating of "2" is considered the upper limit of acceptable for a child of the same age. This process was then repeated for the operational definitions of each of the subject's two other treatment domains. Once the parent supplied frequency and severity data for the given domain, the mental health professional computed an arithmetic mean for each treatment goal, serving as the final weekly measure of behavioral impairment. This process was repeated by the BSC for each week of the child's prescribed treatment period (typically 17-18 weeks), despite any lapse in the face-to-face delivery of BSC, MT and/or TSS service delivery, assessing the same set of behaviors until revised by the Treatment Team with the consent of the licensed psychologist.

Treatment was discontinued if/when the subject met discharge criteria (the pre-determined rating on the PRP for four consecutive weeks) or if the child's caretakers were not collaborating sufficiently with the BHRS providers over a period of at least four consecutive weeks. If BHRS was determined to be an inadequate level of care to meet the needs of the child, a referral to a higher level of care was made to the Treatment Team by the licensed psychologist.

Analysis

A series of paired sample t-tests were conducted to compare the averages of frequency and severity data, utilizing baseline and outcome means obtained through the Parent Report of Progress (PRP). Baseline means were the average ratings for the first four weeks of a given treatment period. Outcome means were the average of the last four consecutive recorded ratings on the PRP in each behavioral domain. The subjects' baseline and outcome means for each individual treatment goal domain were paired to establish a set of repeated measures, analyzing weekly data collected over a period of 10-13 calendar weeks.

Data collected was sorted and split by reported demographic variables (gender, race, income level) as well as by behavioral domain (physical aggression, communication, socialization, safety awareness, non-compliance). Paired-sample t-tests were conducted on the entire sample and each individual group to determine any possible between-subject effects.

In Study #1, subjects' scores were not always from the last four weeks of treatment or post-treatment due to episodic data collection failures. As with baseline scores, subjects whose data did not reflect completed treatment were included. In Study #2, subjects with less than 10 weeks of treatment outcome data were excluded, resulting in a smaller sample size.

Results – Study #1 (2013)

246 treatment plans from 78 children were analyzed (mean of 3.15 plans per subject across the treatment duration); 64 (26%) addressed communication deficits, 61 (24.8%) addressed socialization deficits, 60 (24.4%) addressed noncompliance with adult prompts, 38 (15.4%) addressed a lack of safety awareness, and 23 (9.3%) addressed physical aggression. Treatment duration ranged from 4-450 weeks (mean 80.41 weeks), with 85.5% of treatments lasting less than 3 years.

Analysis revealed an improvement from baseline to outcome measurements across the full sample, $t(245) = 5.366, p < .001$. Analysis of cases from each treatment goal found a statistically significant improvement in treatments addressing physical aggression ($t(22) = 4.159, p < .001$), socialization deficits ($t(60) = 2.485, p = .016$), and a lack of safety awareness ($t(37) = 3.964, p < .001$). No significant improvements in behavior were found for treatment plans addressing noncompliance with adult prompts ($t(59) = 1.366, p = .177$) or communication deficits ($t(63) = 1.303, p = .197$).

Further analyses were conducted examining the effect of treatment on various demographic groups. Significant improvement was found in treatments of children of Caucasian ($t(161) = 3.655, p < .001$) and Asian descent ($t(32) = 5.086, p < .001$). No significant change was found for African American ($t(32) = 1.110, p = .275$) or Hispanic ($t(17) = 1.271, p = .221$) children. A significant improvement was found when treating males ($t(220) = 5.288, p < .001$) but not females ($t(24) = 1.385, p = .179$). Significant differences between baseline and outcome were noted for subjects living above ($t(44) = 2.096, p = .042$) and below ($t(197) = 5.158, p < .001$) the federal poverty level.

Discussion – Study #1

The results indicate that the ET model of BHRS that included TSS attenuated behavioral symptoms in most, but not all populations of children and adolescents with ASD. Importantly, it should be noted that many children were referred to BHRS treatment because of worsening behavior. Frequently, stabilization, and not just improvement, is considered a successful treatment outcome. In fact, the initial treatment plan specifies a designated amount of time where, if behavior remains stable, treatment will cease. The finding that BHRS treatment via the ET model caused a significant decrease in behavioral issues despite this nuance further strengthens the findings in this study.

While results were positive, analyses revealed that the ET model of BHRS was not as effective in attenuating behavioral issues in females or individuals of African American and Hispanic descent. Further investigations are needed to elucidate why all children did not gain comparable benefits. While staff at the Institute for Behavior Change received cultural competency education as a facet of their initial training, more rigorous matching of TSS providers' personality and other attributes with assigned children may improve the consistency of positive treatment outcomes. Since none of the treatment populations experienced a significant increase in behavioral issues, it can be concluded that the ET model of BHRS served to stop behavioral deterioration in all groups.

Results – Study #2 (2016)

165 treatment plans from 55 children were analyzed (mean of 3.0 plans per subject across treatment duration). Subjects ranged in age from 3-18 years ($M = 8.6$), composed of Caucasian (66%), Black (11%), Hispanic (7%), Asian (16%) respondents, with self-reports of income level indicating those below (76%) and above (24%) the Federal Poverty Level. Physical aggression (8%), communication deficits (27%), socialization deficits (14%), non-compliance with adult prompts (27%), and socialization deficits (24%) were targeted behavior (see Table 1).

Analyses were conducted examining the effect of treatment on various demographic groups. With respect to race, there was a significance difference between baseline ($M = 6.28$, $SD = 1.73$) and outcome ($M = 4.85$, $SD = 1.19$) means for Asian subjects; $t(26) = -4.79$, $p < .001$ as well as a significant difference between baseline ($M = 6.23$, $SD = 1.82$) and outcome ($M = 6.86$, $SD = 1.81$) means for Black subjects; $t(17) = 2.21$, $p = 0.041$. There was no significant difference in baseline and outcome PRP measures for Caucasian ($p = .062$) or Hispanic ($p = .913$) subjects.

A significant difference was determined between baseline ($M = 5.99$, $SD = 1.59$) and outcome ($M = 5.54$, $SD = 1.54$) means for male subjects; $t(149) = -4.06$, $p < .001$ and for subjects living in households reporting income levels below the poverty line; $t(125) = -3.60$, $p < .001$. There were no differences between PRP measures for female subjects ($p = .060$) or those with reported household incomes above the poverty level ($p = .204$).

There was no significant difference between baseline and outcomes means for any of the five individual treatment plan behavioral domains (see Table 1). Yet, a significant difference was determined between baseline ($M = 5.97$, $SD = 1.60$) and outcome ($M = 5.65$, $SD = 1.58$) means for the collective sample of subjects; $t(164) = -2.75$, $p = 0.007$.

Discussion – Study #2

Due to the inherent subjective and individual nature of BHR services and treatment, based on the specifics treatment needs of an individual, it is difficult to develop a comprehensive study to determine the efficacy of a given treatment module. Yet with the use of criterion-referenced tools such as the Parent Report of Progress (PRP), acting as a dual quality of life assessment and behavioral progress determinant, the effects of the ET model of BHRS on ameliorating the symptoms of ASD diagnoses in children can be easily analyzed.

For several demographic variables, the results indicated that the ET model of BHRS treatment, composed of a prescribed combination of BSC, MT, and TSS services significantly attenuated behavioral symptoms. Due to the relatively large number of males diagnosed with ASD compared to female counterparts, it is unsurprising that a significant decrease in target behavior was found for male subjects. This effect would likely be replicated for females with ASD in a sample with a larger number of female subjects participating in treatment.

With respect to income, it is also unsurprising that the largest group represented in the sample, those with household income levels below the poverty level, revealed a significant difference in baseline and outcome means, suggesting a decrease in behavioral symptoms over the treatment period. When examining effects between racial groups, a significant decrease in symptoms was determined in

Asian subjects, with a significant increase in behavioral symptoms over the treatment period for Black subjects, and no significant difference for the other groups. Again, these findings are likely due to the small sample size and lack of significant racial diversity in the makeup of our participant group. It should be noted that although cultural competency is a facet of the ET model and training, there is always room for improvement in this particular area of development and practice, creating a culturally diverse and astute staff of treatment providers to reflect the makeup of the client population.

Overall, the composite analysis of the sample's baseline and outcome means revealed a significant decrease in symptoms for subjects with ASD across demographic variables and treatment plan domains, despite no significant difference occurring between individual behavioral domains. This is the most important indicator of the efficacy and applicability of the ET model of BHRS to larger, more diverse populations of children with ASD requiring treatment for behavioral concerns. A study of larger sample should be conducted utilizing the PRP measures of behavioral progress and symptom tracking to determine if it would result in a more accurate, positive reflection on the ability of the ET model to successfully ameliorate the specific domains of aberrant behavior of children with ASD. Evidence supporting this hypothesis was found in Study #1.

Importantly, as was noted in Study #1, many children were referred to BHRS treatment because of worsening behavior. Accordingly, stabilization, and not just improvement, is a successful treatment outcome. In fact, the initial treatment plan specifies a designated amount of time where, if behavior remains stable, treatment will cease. Thus any finding that BHRS treatment caused a significant decrease in behavioral issues despite this nuance further strengthens the findings in the two present studies.

Limitations

While these studies provided additional evidence of the efficacy of the ET model of BHRS, there were a number of limitations. It should be noted that there are inherent limitations in examining BHRS treatment in any scientific evaluation; because BHRS is individualized to the needs of the child, each treatment uses different interventions and requires varied amounts of treatment hours per week. Due to this, caution must be taken in generalizing these results, as the makeup of BHRS treatment varies widely between providers, and even more so for individual cases. This examination can only claim to provide evidence for the efficacy of the ET model of BHRS treatment that integrates ABA practices and Full Fidelity Wraparound principles under the supervision of a licensed professional psychologist.

The primary limitation for the present two studies was the lack of a control group, which limits the degree to which one can conclusively state that the application of the ET model of BHRS treatment caused change in this population above and beyond natural progression as a function of the passage of time. As data collection was a portion of an ongoing professional mental health practice, it was not ethically permissible to withhold treatment from subjects enrolled in treatment. Although there is substantial evidence to support the validity of single subject studies, with study participants acting as their own controls, further investigation into the ET model would benefit greatly from a repeated measures design highlighting the effects of periods during which services lapsed or when gaps in service delivery occurred to determine the true effect of treatment implementation on a subject's outcome data. With data from over 2,000 treatment plan deliveries between 2002 and 2015, a

substantial database exists from which numerous Single Subject with Repeated Measures experimental design investigations can be conducted.

The current measure used within this investigation, the Parent Report of Progress (PRP), was chosen due to its criterion-referenced nature and ease of administration and clarity for parents. Clinical practice necessitated that parents assess the child's progress on a weekly basis. Yet several issues exist with the reliability of the PRP due to the nature of its structure and subjectivity of respondents. Parents could conceivably have an expectancy bias in their ratings, perceiving behavior improvements due to the presence of treatment, or may report that their child is not improving as a means of coercing the extension of treatment inappropriately and unnecessarily. Since BHRS cannot be delivered "for the convenience of parents or staff," it is unlikely that parents would be allowed to manipulate the data collection process except for infrequent discrete violations by particular individuals. Although parents are expected to be "in charge" of their child's education according to the Federal Education Rights and Privacy Act (FERPA), they may not be a sufficiently knowledgeable rater for the frequency and severity of behavior occurring in school or community settings, where they would rarely be present, unless they can rely on the reports received from teachers, BHRS providers and others. The consistency with which such reports are given to parents by teachers and other school authorities, and their depth, has been diminishing consistently over the past 20 years. Accordingly, weekly consultation between the BSC and the parent for the purpose of delivering accurate information about behavioral observations in school that could facilitate accurate Parental Report of Progress is a prerequisite for accurate BHRS treatment outcome monitoring. Further data collection and subsequent analysis would benefit greatly from the utilization of a revised measure of reporting behaviors across settings with carefully constructed respondent scales and the possible inclusion of multiple raters for respective treatment settings, to minimize the effect of rater bias and increase reliability.

Lastly, although a series of demographic variables were examined in the two present studies, they are likely not the best indicators in determining the efficacy of this treatment program. Within the data collection process of the second study, the length of the treatment program and the number of hours of service rendered within a given period were omitted. In the first study, this information was included but was not referenced in the analysis that was submitted. Both of these factors should be included in further studies of BHRS models to determine the efficacy of treatment based on quantifiable measures of service delivery. Qualitative variables were omitted from both studies, with factors that may have played a large role in their child's progress giving no context to the PRP measure (e.g. child was ill, parents experiencing divorce, etc.) It is recommended that along with developing valid collection measures, a future analyses of the ET model of BHRS should incorporate mixed methods to include vital contextual, qualitative data relevant to the child's behavioral ratings and progress.

Conclusions

Despite these limitations, the results are a promising step in examining the efficacy of the ET model of BHRS treatment for children with ASD. Further research is necessary to examine BHRS treatment using more rigorous experimental standards, as well as to examine factors that improve treatment outcomes across all behavioral domains.

For BHRS to be optimally successful in varying settings and with varying populations of children, some essential components are recommended:

1. The BHRS program should include TSS services in amount, duration and scope that is consistent with published standards by the National Academy of Sciences and the American Academy of Pediatrics for children with Autism Spectrum Disorders (a minimum of 25 hours of “intensive, individualized treatment” per week, year-round).
2. TSS services should be provided by Bachelors level mental health professionals who receive ongoing training and supervision by licensed mental health professionals and Masters level mental health professionals regarding the use of evidence-based practices including “evidence-based kernels,” ABA practices and Full Fidelity Wraparound principles in the therapeutic management and redirection of aberrant behavior in children.
3. The treatment planning and delivery process should be overseen by licensed mental health professionals (especially licensed psychologists with expertise in treating children) who devote at least one hour weekly to the supervision of the Masters-level Behavior Specialist providers, who in turn provide individual weekly supervision to the TSS providers.
4. The treatment plan should be a written document that includes operationally defined target and replacement behavior (such that the behavior can be measured unequivocally by the TSS provider and the parent or other caregivers), explicitly defined implementation methodology and unequivocal crisis intervention, titration, transition and discharge plans.
5. The progress of the child in treatment should be monitored weekly by the parent in a collaborative process wherein the Behavior Specialist assists the parent in making an informed assessment of the frequency and severity of the child’s target (aberrant) behavior in the past week by comparing it to the behavior displayed in the preceding week.

Conflict of Interest

Steven Kossor is the founder and Executive Director of the Institute for Behavior Change, a company providing staff who deliver BHRS treatment services to children and the Director of the Network for Behavior Change, the site at which the two present studies were conducted. Mark Versella was employed as a research analyst at the Institute for Behavior Change and conducted his analyses in 2012 and 2013. Amanda Winter is employed as a research analyst at the Institute for Behavior Change and conducted independent analyses in 2016 of a smaller subset of data from children with Autism spectrum disorders that was drawn from the same database that Mr. Versella used.

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Table 1: Paired Sample T-Tests on Baseline/Outcome Means for ET BHRS model

Demographic Scales	N	Baseline Mean	Outcome Mean	t-value	Sig.
<i>Sex</i>					
Male	50	5.99	5.54	-4.057	<.001
Female	5	5.73	6.76	2.048	.060
<i>Race</i>					
Caucasian	36	5.82	5.60	-1.886	.062
Black	6	6.23	6.86	2.209	.041
Hispanic	4	6.17	6.09	-.111	.913
Asian	9	6.28	4.85	-4.785	<.001
<i>Income</i>					
Below Poverty Level	42	5.91	5.42	-3.595	<.001
Above Poverty Level	13	6.17	6.41	1.292	.204
<i>Treatment Goal</i>					
Physical Aggression	14	5.25	4.55	-1.474	.164
Communication	44	5.88	5.85	-.145	.886
Safety	23	6.63	5.82	-2.036	.054
Noncompliance	44	6.03	5.67	-1.758	.086
Socialization	40	5.86	5.70	-.754	.455
Combined-Overall	165	5.97	5.65	-2.750	.007

Appendix A: Parent Report of Progress (PRP)

Child's Name: *LN*, *FN*

MAID #: *MAID*

Target #1: *Target1 operational*

Target #2: *Target2 operational*

Target #3: *Target3 operational*

Frequency Ratings:

0-1 nonexistent **2** Upper limit of normal for age **3-4** several times/wk **5-6** many times/wk **7-8** several times/day **9-10** constantly

Severity Ratings:

0-1 utterly benign **2** Upper limit of normal for age **3-4** enough to worry you **5-6** very serious **7-8** alarmingly serious **9-10** catastrophic

Once each **week** record the *rater*'s ratings about frequency and severity of the target behavior below.

Date m/d/yyyy	Target Behavior Description	Frequency	Severity	Average
	Target 1: *target1*			
	Target 2: *target2*			
	Target 3: *target3*			
	Target 1: *target1*			
	Target 2: *target2*			
	Target 3: *target3*			
	Target 1: *target1*			
	Target 2: *target2*			
	Target 3: *target3*			
	Target 1: *target1*			
	Target 2: *target2*			
	Target 3: *target3*			
	Target 1: *target1*			
	Target 2: *target2*			
	Target 3: *target3*			
	Target 1: *target1*			
	Target 2: *target2*			
	Target 3: *target3*			
	Target 1: *target1*			
	Target 2: *target2*			
	Target 3: *target3*			
	Target 1: *target1*			
	Target 2: *target2*			
	Target 3: *target3*			
	Target 1: *target1*			
	Target 2: *target2*			
	Target 3: *target3*			
	Target 1: *target1*			
	Target 2: *target2*			
	Target 3: *target3*			
	Target 1: *target1*			
	Target 2: *target2*			
	Target 3: *target3*			

BSC Collecting Data: *BSC*

Person Supplying Information:

The Institute for Behavior Change

FAX to our secure, confidential line at 610-524-8705 MAIL to: IBC
 120 E. Uwchlan Ave. Suite 202
 Exton, PA 19341-1275

Referral Source			
Referral Source: _____	Referral Date: _____	Referral phone: _____	
Relationship to Child: _____		Referral Fax: _____	
Child and Family Information			
Child's Name: _____	DOB: _____	SSN: _____	
Child's Age: _____	Gender: _____	Ethnicity: _____	Primary Language: _____
Child's Address: _____			
<small>Street</small>	<small>City</small>	<small>State</small>	<small>Zip</small>
County of Residence: _____	Pediatrician: _____	Phone: _____	
Parent/Guardian: _____	Home Phone: _____	Cell Phone: _____	
Parent/Guardian: _____	Home Phone: _____	Cell Phone: _____	
What is the best way to contact you: _____			
Legal Custody Arrangement: _____			
Primary Health Insurance: _____ Policy #: _____ Group #: _____			
Medical Assistance: <input type="checkbox"/> Yes <input type="checkbox"/> No Medical Assistance Number: _____			
Reason for Referral			
Reason for Referral (use the Tab key to move to the next row if you are filling this form out with a computer):			
Check all that apply: <input type="checkbox"/> Aggressive toward Adults <input type="checkbox"/> Aggressive toward Peers <input type="checkbox"/> Places self in danger			
<input type="checkbox"/> DHS/CYF Client <input type="checkbox"/> Suicide attempt <input type="checkbox"/> Cognitive Impairment <input type="checkbox"/> School Problems <input type="checkbox"/> Drug Abuse			
<input type="checkbox"/> Alcohol Abuse <input type="checkbox"/> Autism Spectrum <input type="checkbox"/> Legal involvement <input type="checkbox"/> Currently in Hospital or Residential Treatment			
Current Medication & Dosages: _____			
Medical Conditions: _____			
How Did you Hear of Us: _____			
Office Use Only			
Date Received: _____	EVS Date: _____	Screening Date: _____	BSCs: _____ Date Assigned: _____

Appendix C: Information Questionnaire for Life Domain Bio-Psycho-Social Evaluation

Identifying Information

Date: _____

NAME: _____

First Contact: _____

MA#: _____ SS#: _____ - _____ - _____

Birthdate: _____

Address: _____

Current School: _____

Grade: _____

Current Custody of Child: _____ Copy of Record if Court Ordered

Home Phone: _____ Work Phone: _____

Cell Phone: _____

Gender: _____ Race: _____

Chronological Age: _____

Reason for Referral

A. Describe medical necessity for services [i.e. to prevent child from being placed outside the home]

B. Identify additional purposes [i.e. respond to crisis situations]

Qualitative Observations

Hair color: _____ Eye color: _____ Stature: tall for age short for age average for age
 Right handed left handed ambidextrous Weight: overweight underweight average for age

Assessment Techniques Used (check item(s) used in this evaluation)

- Information Questionnaire (this form) and interview with parents, review of records
 Other assessment methods (specify) _____
 Interview with education placement staff Other (specify): _____

Current Strengths (list all exceptional physical, mental or emotional skills or abilities, including favorite sport(s), favorite school subject(s), anything he/she does often is probably a strength)

Motivation for services (Does the child and the parent **want** to receive the services?) **yes**

Needs and Concerns (check 3 boxes and circle Target 1, Target 2 or Target 3 for each box checked)

- | | | | |
|---|----------|----------|----------|
| <input type="checkbox"/> PA- Physical Aggression | Target 1 | | |
| <input type="checkbox"/> SA- Lack of Safety Awareness | Target 1 | Target 2 | |
| <input type="checkbox"/> NC- Noncompliance with Adult Prompts | Target 1 | Target 2 | Target 3 |
| <input type="checkbox"/> CD- Communication Deficits | Target 1 | Target 2 | Target 3 |
| <input type="checkbox"/> SO- Socialization Deficits | Target 1 | Target 2 | Target 3 |

Nature of concerns (operational definitions) Ensure you discuss how the child expresses the behavior, either externally, internally or both and what it looks like.

Appendix C: Information Questionnaire for Life Domain Bio-Psycho-Social Evaluation

BASELINE Target Behavior Operational Definitions	Typical Incidence	Frequency scale 1-10	Severity scale 1-10	Duration (average)
	____ times per day			____ minutes
	____ times per day			____ minutes
	____ times per day			____ minutes

Summary of family resources, strengths and barriers to treatment (*attachment patterns, influence of parental experiences on parenting skills*)

- A. Family composition, including relevant extended family (Identify each biological parent, household member, step-parent, sibling/half-sibling, etc.)
- B. Marital status of parents
- C. Nature of child’s contact with a non-custodial parent
- D. Family ethnicity
- E. Family cultural/religious beliefs
- F. Family history of psychiatric disorder and any related treatment

Community resources, neighborhood safety issues, peer group, cultural and related issues (*including SSI, SSDI, other support (from friends, relatives):*)

Participates in (circle all that apply) YMCA, church youth group, community sports?

Other:

Does **parent** consider neighborhood safe? **yes** **no**

comments:

- A. Community attachments and activities (church group, Little League, etc)
- B. Patterns of peer relationships in the neighborhood
- C. Predominant age of peers (same-aged, older or younger?)
- D. Predominant gender of peer relationships:
- E. Apparent or disclosed nature of neighborhood safety
- F. Other team members, including involved professional agencies/systems (eg. MH/MR, C&Y, juvenile justice, case management, child psychiatrist, special education, etc.)

Appendix C: Information Questionnaire for Life Domain Bio-Psycho-Social Evaluation

Psychological-Psychiatric History

- A. History of child's initial behavior symptoms or classification with Serious Emotional Disturbance (SED)
- B. Outpatient or Family Counseling (Reason, level of participation & effectiveness)
- C. Partial Hospitalization (Reason, level of participation & effectiveness)
- D. Out-of-Home Placement (Inpatient or Residential treatment, Reason, level of participation & effectiveness)
- E. Witness to domestic or other violence?
- F. Multiple separations from primary caregivers (especially for adopted children)
- G. Victimization (*bullying, sexual molestation or exploitation*)

Educational History & School Behavior Concerns (*achievement including typical grades, classroom behavior, accommodations used by school, peer relationships, and apparent or existing Special Ed status*)

- A. Academic adaptation (*How are the child's grades?*)
- B. Characteristics of current school and specific class setting (*number of students and aides in the classroom*)
- C. Behavioral adaptation (*Are behavioral problems occurring at school? [describe]*)
- D. Peer relationships at school (*victim of bullying, avoidant, friends?*)
- E. Relationships with teachers (*i.e. confrontational or friendly?*)
- F. Efforts of school to address current problems (*i.e. Do they have a Behavior Support Plan & do they use it?*)
- G. Characteristics of current class setting (*Ratio of students to teachers, total number of people in the class*)
- H. Current or past use of school-based services, if relevant (*i.e. Learning or Emotional Support, School Psychiatrist or Psychologist, OT, PT, Speech Therapy*)
- I. Prior school (*What other schools, pre-schools or daycares has the child attended? Provide timelines*)

Aggression & Suicidal History (*suicidal behavior, ideation, and history of aggression, if any*)

Maturational History (*developmental milestones including walking talking, gross-motor and fine-motor development, toilet training, cognitive development, peer relationships, interests, hobbies and talents, and general physical fitness*)

Dietary concerns, eating habits, food texture sensitivities:

Legal History (*legal circumstances relevant to treatment for both child and guardians*)

Appendix C: Information Questionnaire for Life Domain Bio-Psycho-Social Evaluation

Substance Abuse History (including eating or mouthing of inedible objects)

Domestic Violence History (note if this has been or is an issue and supply details if so)

Medical Intervention History

- A. Developmental history **pregnancy**: (including medical or psychological complications, maternal smoking and maternal drug or alcohol use. Also, prenatal care)
- B. Developmental **milestones** (motor, speech and language, cognitive, emotional, adaptive, as well as relational capacity)

Current medical status (ongoing serious illnesses, other current medical concerns)

- A. Medical illness, including acute & chronic infection (Lyme Disease, etc):
- B. Physical or sensory limitations:
- C. Serious injury, especially Brain injury (*Neurological disorder, seizures, loss of consciousness*)
- D. Lead or other toxicity:
- E. Last Physical Exam Date: _____
- F. Primary Care Physician Name, Address & Phone:

Psychotropic Medication History, including indications and dosages received

Medication Name	Daily Dose	Prescribing Physician	Reason Prescribed & Start Date (Stop Date, if applicable)

- A. Psychiatrist Name, Address & Phone _____
 - Occupational Therapy (Reason, schedule of sessions & effectiveness)
 - Physical Therapy (Reason, schedule of sessions & effectiveness)
 - Speech Therapy (Reason, schedule of sessions & effectiveness)
 - Other therapy (Reason, schedule of sessions & effectiveness)

Noteworthy Effective Interventions (identify the interventions that work well)

Noteworthy Ineffective Interventions (identify the interventions that have failed)

Appendix C: Information Questionnaire for Life Domain Bio-Psycho-Social Evaluation

Known barriers to Treatment (any circumstances that could impede progress such as divorce, custody issues, parental refusal to engage in services, moving, etc.)

Mental Status Evaluation (Identify participants):

Hygiene and self-care: Are there hygiene deficits? Does the child care for dressing, bathing or other activities of daily living **independently**?

Judgment & Insight: Does the child know right from wrong? Is he/she self-protective & avoids danger? Does the child have any idea of his/her situation and how it came about?

Thought & Orientation: Does the child see or hear things that "aren't there?" Does the child believe he/she has powers and abilities that are "beyond those of mortal men?" Are memory problems apparent? Does the child know the month, day, year and time? Does he/she know **where** he/she is and **who** he/she is?

Mood: Does the child's mood rise and fall in extremes? Is he/she prone to depression? Is the child now (or has ever been) suicidal or homicidal?

Affect: What is the child's typical emotional state (happy, depressed, suspicious, etc)?

Suicidal and Homicidal ideation: Is the child now (or has ever been) suicidal or homicidal?

Impulse Control: Can the child control impulses and tolerate delay in gratification?

Psychosocial skills: Can the child interact cooperatively with peers, or adults, or neither, or both?

Physiological functions: Any physical problem that influences behavior (such as seizures)?

Perceptual: Is there anything wrong with the child's senses (hearing, vision, smell, touch, taste)?

Cognitive: Is there any evidence of mental retardation (IQ < 72, poor social skills, age < 18)?

Gender Preference for therapist expressed by child by parent No preference Male Female

Racial Preference for caregiver expressed by child by parent No preference Race: _____

Prognosis with treatment: good guarded poor

DSM 5 diagnoses

Children's GAF Past: _____ Now: _____

Recommendations

Non-BHRS Recommendations (Psychotropic medication referral, additional assessments, community referrals, education/vocation recommendations, consultation with primary care physician, etc)

Therapeutic Staff Support Services:

School-Related (times of day and days of the week that services are to be requested):

	M	T	W	R	F	SA	SU	
FROM – TO								TOTAL
HOURS								

Home & Community (times of day and days of the week that services are to be requested):

	M	T	W	R	F	SA	SU	
FROM – TO								TOTAL
HOURS								

Mobile Therapist Services: _____ hours/ week Behavior Specialist Consultant: _____ hours/week

OTHER

The
INSTITUTE
for Behavior Change



120 East Uwchlan Ave. Suite 202 Exton, PA 19341-1275 www.ibr-pa.org phone: 610.524.8701 fax: 610.524.8705

Behavioral Health Rehabilitation (BHR) Services Summary

The Institute for Behavior Change staff provides BHR Services to children (anyone under the age of 21) in their homes, schools and community under the supervision of licensed psychologists. These services include psychological testing, behavior treatment programs, psychological counseling and consultations with parents, medical doctors, teachers and others in the child's interest. We are allowed to deliver these services only if at least one parent (or guardian) is *actively* involved in the planning and delivery of the treatment program. If a parent is not actively participating in the treatment program, services must be stopped. Here is how we plan and deliver services. If you have any questions about this process, please call 610-524-8701 anytime. We will return your call as quickly as possible but certainly within 24 hours, or on Monday following a weekend. You can leave an emergency message and receive an *immediate* response by leaving your message at extension #160.

The written Treatment Plan that describes and governs a child's treatment program is always developed with input from the child, parent(s), teacher(s) and other adults who have roles in the child's life. The child's strengths, weaknesses, and treatment needs will be reviewed on an ongoing basis by a **Behavior Specialist** who will consult with parents (and others, if necessary) at least once weekly to gather data about the child's progress. A **Therapeutic Staff Support (TSS)** provider may be assigned to work directly with the child to implement the child's treatment plan on an intensive, one-to-one basis for several hours each week. A **Mobile Therapist** may meet with the child at home, in school, or elsewhere in the community to provide psychological counseling on one or more occasions each week. The Mobile Therapist and Behavior Specialist may also meet with the child's teachers, extended family members, or other adults who interact with the child, so that all adults in the child's life can "be on the same page" regarding the child's strengths, weaknesses and treatment needs. A licensed psychologist assumes full and complete professional responsibility for all services provided.

A new authorization for BHR Services must be re-approved every four months. Prior to each re-authorization request meeting, the parent/guardian (and teacher, if services are rendered in a school) will be asked to *carefully* review the psychological evaluation, treatment plan and plan of care -- to make sure that all of these documents contain accurate, up-to-date, and complete information about the child. Accurate and complete information makes it possible to obtain re-authorization of services from Managed Care Organizations (MCO) as efficiently as possible. Without an MCO authorization to continue delivering services, it is not possible to continue providing services.

BHR Service providers are required by law to make prompt reports of suspected child abuse or neglect to state authorities. If a child is suspected of being the victim of abuse or neglect, the BHR Service provider must make a report of this suspicion to state authorities. If this becomes necessary, the child's parent or guardian will be notified promptly that a report has been filed. Parents or guardians are invited to contact the Executive Director of the Institute for Behavior Change, Steven Kossor, at 610-524-8701 ext 160 to discuss questions about this or any other aspect of the BHR Service treatment delivery process. BHR Services are delivered without charge to the children and families who receive them. Because public funds are used to provide these services, it is important that careful records are kept to document the dates, times and types of services rendered. Caretakers should sign documentation for services only if those services *were actually delivered as written*. A TSS provider cannot act as a teacher's aide (supervise the classroom, copy papers, hand out things to the class, review work, etc) and should strive to remain as far away from the child as possible that still allows delivery of appropriate prompts.

BSC Name: _____

BSC Phone: _____

The
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120 East Uwchlan Ave. Suite 202 Exton, PA 19341-1275 www.abc-pa.org phone: 610.524.8701 fax: 610.524.8705

Evaluating the Effectiveness of the IBC Model for Treating Mental Illnesses in Children Using Behavioral Health Rehabilitation Services (BHRS) via the Medicaid EPSDT mandate

- ✓ The Institute for Behavior Change staff have been helping children with diagnosed mental illnesses by providing in-home and in-classroom psychological evaluation, treatment planning and outcome monitoring, and behavioral support services since 1997. Of more than 500 children treated by IBC staff, 90% have completed treatment in 3 years or less; 75% in under 2 years. Applied Behavior Analysis principles are implemented conscientiously in all Treatment Plans.
- ✓ IBC provides staff to deliver Behavioral Health Rehabilitation Services (BHRS) under the supervision of Licensed Psychologists via the Medicaid statute. These services can be created in any state under Early and Periodic Screening, Diagnosis and Treatment (EPSDT) regulations that are a mandatory part of the federal Medicaid statute. In Pennsylvania and many other states, any child with a disabling mental illness is eligible for these services, at no cost whatsoever, *regardless of family income*.
- ✓ Behavior is addressed in five basic domains: 1) physical aggression (2) lack of safety awareness, (3) socialization deficits, (4) communication deficits, and (5) noncompliance with adult prompts. Each child in treatment has three goals drawn from these domains in each four-month treatment period. Treatment periods can be repeated as often as necessary (using the intentionally broad definition of “medical necessity” required by the Federal Medicaid statute) up to the child’s 21st birthday.

Methods

- ✓ A child is prescribed necessary BHRS treatment by a licensed psychologist, following a thorough bio-psycho-social evaluation of the child’s strengths, weaknesses and needs, summarized in a 12+ page evaluation report and a written treatment plan. The plan is implemented by a Treatment Team that includes the child, the parent(s), teacher(s) and Bachelor-level Therapeutic Staff Support (TSS) providers who function under the weekly supervision of Masters-level Behavior Specialist Consultants (who are themselves supervised each week by the licensed psychologists). In the present study, TSS service varied from 10 to 35 hours per week. Behavior Specialists provided 2-3 hours of service per week.
- ✓ The child’s parent provides direct feed-back to the Behavior Specialist as to the frequency and severity of target behavior. Data is collected weekly from the parent throughout the treatment monitoring period. Data for 587 treatment periods was available for study, but only the data from the *first* 13-weeks of the treatment period for any given child was analyzed in the present study, to control for the effect of time in treatment.

Sample

- ✓ 301 treatment periods (the first 13-week BHRS experience for all subjects) were analyzed, children ranged in age from 3-17.
 - 13.6% - Ages 3-4
 - 47.6% - Ages 5-8
 - 25.6% - Ages 9-12
 - 13.0% - Ages 13-17
- ✓ The sample included children of various backgrounds including Caucasian (79.2%), Asian (10%), and African American, Bi-racial, and Latino/a (10.8%). The latter group was formed due to the small sample size.
- ✓ The diagnoses of the children included Autistic Spectrum Disorders (47.3%), ADHD (26.8%), Mood Disorder, (11.4%), and Behavioral Disorders (14.4%).
- ✓ This was the first outpatient treatment experience for 72% of the children; 28% had previously received outpatient psychotherapy and 12% had previously received inpatient mental health treatment. None of the children were receiving any mental health treatment in addition to BHRS during the period of the study.

Results

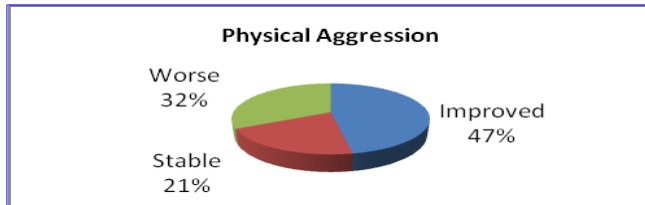
- ✓ At least 15% net change in target behavior was shown by the following percentages of children after 13 weeks of treatment.

Note: The table shows the “net” rate of change after 13 weeks of treatment, *including* the escalation of target behavior that typifies the “extinction burst” phenomena common in all initial treatment periods.

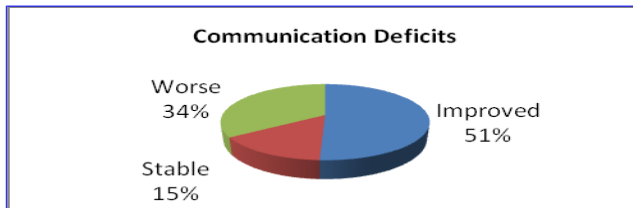
Target Behavior Domain	Improved or Stabilized
Physical Aggression	68%
Communication deficits	66%
Socialization deficits	62%
Lack of Environmental Safety	58%
Noncompliance with adult prompts	57%

- ✓ All children had escalating behavior problems at the start of treatment, so improvement or stabilization of target behavior should be considered “successful treatment.” Not all children could be successfully treated in just 13 weeks. Of the 587 treatment records that were submitted for analysis, 79% had improved or stabilized behavior within 3 years, leaving only 21% who did not respond positively to the BHRS treatment implemented by the staff of the Institute for Behavior Change.
- ✓ The percentage of change between week 1 and week 13 was also examined, and also consistently showed overall effectiveness.
- ✓ Hierarchical linear modeling (HLM) was used to determine if the IBC treatments were related to improvements in client behavior.
 - Although a control group is necessary in order to claim that treatment caused behavior change in the children, HLM establishes that decreases in target behaviors occurred during the IBC treatment period.
 - HLM was chosen for the analysis because the data have a nested, multilevel structure, with time points nested within individual children. This process ensures that the violation of the assumption that observations are independent of each other is accounted for (Guo, 2005).
- ✓ Analyses confirmed that increased time in treatment was significantly related ($p < .05$) to better outcomes in four of the five behavior domains for all children (the fifth domain, *Safety Awareness*, achieved a significance level of $p = .051$).
 - Age and gender were both shown to be significant predictors for change in physical aggression. Males improved more than females ($p = .017$), and younger children improved more than older children ($p = .03$).
 - A cross level interaction was found, indicating that children who spent longer times in treatment generally showed less noncompliance with adult prompts over the course of treatment.
 - Younger children were more likely to show improvement in safety awareness than older children.

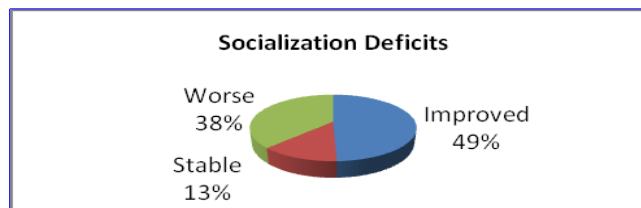
Charts for the top 3 improvement areas:



68% overall success in 13 weeks



66% overall success in 13 weeks



62% overall success in 13 weeks

Discussion

- ✓ Treatment provided by IBC staff is positively related to a decrease in identified target behavior (level one predictors).
- ✓ Improvements occurred in all five domains over the 13 week monitoring period. Considering that the first 13 weeks of treatment often show the *slowest* rate of improvement (as the child adjusts to changes imposed by the treatment plan, while rapport with the treatment team is being established, and the common “extinction burst” phenomena occurs), the rates of improvement shown are remarkable.
- ✓ Regarding physical aggression, age and gender influenced outcomes with boys and younger children more likely to show improvement within the first 13 weeks of treatment.
- ✓ Regarding safety awareness, younger children are more likely to improve in the first 13 weeks of treatment than older children.
- ✓ Among Medicaid recipients, BHRS is received disproportionately by Caucasian children, suggesting inadequate dissemination of information about the availability of BHRS via the EPSDT mandate, to families of children eligible for Medicaid.
- ✓ More research is planned to investigate the effects of BHRS on children, including analyses of successive treatment programs for the same child over periods of 1 to 2 years. Data suggests increasing effectiveness of BHRS over time.

The research cited in this monograph was conducted by Dr. Natasha K. Bowen and Erica L. Richman at the University of North Carolina at Chapel Hill. The raw data is available at www.abc-pa.org where over 1,000 records exist in our BHRS treatment outcome database. We invite independent researchers to contact us regarding access to this data for research purposes, including long-term outcome studies.

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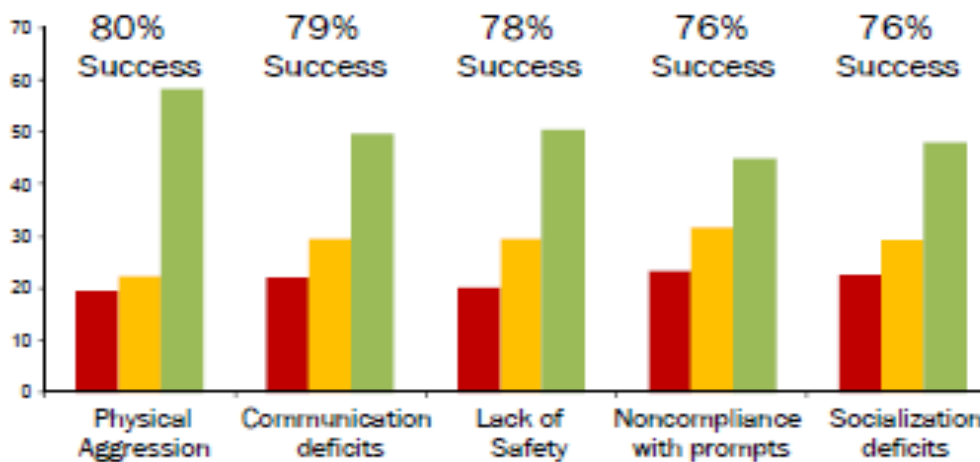


120 East Uwchlan Ave. Suite 202 Exton, PA 19341-1275 www.abc-pa.org phone: 610.524.8701 fax: 610.524.8705

Thomas Jefferson University, Philadelphia July 2010

PROMISING TREATMENT CONFIRMED FOR CHILDREN WITH INAPPROPRIATE BEHAVIOR

Researcher Staci Perlman, Ph.D. of Thomas Jefferson University in Philadelphia studied 887 treatment records of children age 3 to 19 between 2002 and 2010 and discovered that Behavioral Health Rehabilitation Services (BHRS) delivered by the staff of the Institute for Behavior Change were associated with highly significant reductions in the display of physical aggression, noncompliance with adult prompts, socialization deficits, communication deficits & lack of safety awareness. Because there was no comparison group, no claims of causality can be made, but the large number of cases studied and findings consistent with those of previous research shows that the BHRS model created by licensed psychologist Steven Kossor has remarkable promise for treating children with Autism, ADHD & other serious behavioral challenges. The probability that these results are due to chance is less than 3 in 1,000 for all five of the behavioral domains analyzed.



- **887 treatment programs**
- **over 75% significantly improved or stabilized**
- **in one year or less**

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Our model of BHRS is *Applied Behavior Analysis in Action*

The Institute for Behavior Change staff delivers Behavioral Health Rehabilitation Services (BHRS, often mistakenly called "wraparound services" in Pennsylvania) to children under the age of 21 who are disabled and enrolled in Medicaid. The BHRS model developed by our Founder and Executive Director, Steven Kossor, infuses "Full Fidelity Wraparound" methodology with Applied Behavior Analysis (ABA) procedures to deliver *Effective Treatment in a Wraparound Cup*[®] in homes, schools and other community settings under the scope of practice of licensed professional psychologists. Services include psychological testing, behavior treatment programs, psychological counseling and consultations with parents, medical doctors, teachers and others in the child's interest. At least one parent (or guardian) must be *actively* involved in the planning and delivery of our BHRS program. We take outcome data *every week* from parents and use that data to improve the quality of the treatment process, in accordance with the evidence-based standards of ABA and Wraparound practice.

A written Treatment Plan that describes and governs a child's treatment program is always developed with input from the child, parent(s), teacher(s) and other adults who have roles in the child's life. The child's strengths, weaknesses, and treatment needs are reviewed on an ongoing basis by a Masters-level **Behavior Specialist** who consults with parents (and others, if necessary) at least once weekly to gather data about the child's progress. A **Therapeutic Staff Support** (TSS) provider may be assigned to work directly with the child to implement the child's treatment plan on an intensive, one-to-one basis for several hours each week. A **Mobile Therapist** may meet with the child at home, in school, or elsewhere in the community to provide psychological counseling on one or more occasions each week. The Mobile Therapist and Behavior Specialist may also meet with the child's teachers, extended family members, or other adults who interact with the child, so that all adults in the child's life can work collaboratively. A licensed psychologist assumes full and complete professional responsibility for all services provided.

What is Applied Behavior Analysis (ABA)?

Source: <http://encyclopedia.thefreedictionary.com/applied+behavior+analysis>

Applied Behavior Analysis (ABA) is the science of controlling and predicting human behavior. Behavior analysts reject the use of [hypothetical constructs^{\[1\]}](#) and focus on the observable relationship of behavior to the environment. By functionally assessing the relationship between a targeted behavior and the environment, the methods of ABA can be used to change that behavior. Research in applied behavior analysis ranges from behavioral intervention methods to basic research which investigates the rules by which humans adapt and maintain behavior.

Areas of Application

ABA-based interventions are best known for treating people with developmental disabilities, most notably autism spectrum disorders.^[2] However, applied behavior analysis contributes to a full range of areas including: AIDS prevention,^[3] conservation of natural resources,^[4] education,^[5] gerontology,^[6] health and exercise,^[7] industrial safety,^[8] language acquisition,^[9] littering,^[10] medical procedures,^[11] parenting,^[12] seatbelt use,^[13] severe mental disorders,^[14] sports,^[15] and zoo management and care of animals.^[16]

Definition of ABA

ABA is defined as the science in which the principles of the analysis of behavior are applied systematically to improve socially significant behavior, and in which experimentation is used to identify the variables responsible for change in behavior.^[17] It is one of the three fields of behavior analysis. The other two are [behaviorism](#), or the philosophy of the science; and [experimental analysis of behavior](#), or basic experimental research.^[2]

Baer, [Wolf](#), and Risley's 1968 article^[18] is still used as the standard description of ABA.^[19] It describes the seven dimensions of ABA: application; a focus on behavior; the use of analysis; and its technological, conceptually systematic, effective, and general approach.

Characteristics of ABA

Baer, Wolf, and Risley's seven dimensions are:

- **Applied:** ABA focuses on areas that are of social significance. In doing this, behavior scientists must take into consideration more than just the short-term behavior change, but also look at how behavior changes can affect the consumer, those who are close to the consumer, and how any change will affect the interactions between the two.
- **Behavioral:** ABA must be behavioral, i.e.: behavior itself must change, not just what the consumer says about the behavior. It is not the goal of the behavior scientists to get their consumers to stop complaining about behavior problems, but rather to change the problem behavior itself. In addition, behavior must be objectively measured. A behavior scientist can not resort to the measurement of non-behavioral substitutes.
- **Analytic:** The behavior scientist can demonstrate believable control over the behavior that is being changed. In the lab, this has been easy as the researcher can start and stop the behavior at will. However, in the applied situation, this is not always as easy, nor ethical, to do. According to Baer, Wolf, and Risley, this difficulty should not stop a science from upholding the strength of its principles.^[18] As such, they referred to two designs that are best used in applied settings to demonstrate control and maintain ethical standards. These are the reversal and multiple baseline designs. The reversal design is one in which the behavior of choice is measured prior to any intervention. Once the pattern appears stable, an intervention is introduced, and behavior is measured. If there is a change in behavior, measurement continues until the new pattern of behavior appears stable. Then, the intervention is removed, or reduced, and the behavior is measured to see if it changes again. If the behavior scientist truly has demonstrated control of the behavior with the intervention, the behavior of interest should change with intervention changes.
- **Technological:** This means that if any other researcher were to read a description of the study, that researcher would be able to "replicate the application with the same results".^[18] This means that the description must be very detailed and clear. Ambiguous descriptions do not qualify. Cooper *et al.* describe a good check for the technological characteristic: "have a person trained in applied behavior analysis carefully read the description and then act out the procedure in detail. If the person makes any mistakes, adds any operations, omits any steps, or has to ask any questions to clarify the written description then the description is not sufficiently technological and requires improvement."^[20]

Appendix G: Description of Applied Behavior Analysis as used in the ET model of BHRS

- **Conceptually Systematic:** A defining characteristic is in regards to the interventions utilized; and thus research must be conceptually systematic by only utilizing procedures and interpreting results of these procedures in terms of the principles from which they were derived.^[20]
- **Effective:** An application of these techniques improve behavior under investigation. Specifically, it is not a theoretical importance of the variable, but rather the practical importance (social importance) that is essential.^[18]
- **Generality:** It should last over time, in different environments, and spread to other behaviors not directly treated by the intervention. In addition, continued change in specified behavior after intervention for that behavior has been withdrawn is also an example of generality.

In 2005, Heward, et al. added their belief that the following five characteristics should be added:^[21]

- **Accountable:** Direct and frequent measurement enables analysts to detect their success and failures to make changes in an effort to increase successes while decreasing failures. ABA is a scientific approach in which analysts may guess but then critically test ideas, rather than "guess and guess again".^[22] This constant revision of techniques, commitment to effectiveness and analysis of results leads to an accountable science.
- **Public:** Applied behavior analysis is completely visible and public. This means that there are no explanations that cannot be observed. There are no mystical, metaphysical explanations, hidden treatment, or magic^[21]. Thus, ABA produces results whose explanations are available to all of the public.
- **Doable:** ABA has a pragmatic element in that implementors of interventions can consist of a variety of individuals, from teachers to the participants themselves. This does not mean that ABA requires one simply to learn a few procedures, but with the proper planning, it can effectively be implemented by most everyone willing to invest the effort.^[21]
- **Empowering:** ABA provides tools to practitioners that allow them to effectively change behavior. By constantly providing visual feedback to the practitioner on the results of the intervention, this feature of ABA allows clinicians to assess their skill level and builds confidence in their technology.^[23]
- **Optimistic:** According to several leading authors, practitioners skilled in behavior analysis have genuine cause to be optimistic for the following reasons:
 - The environmental view is essentially optimistic as it suggests that all individuals possess roughly equal potential^[24], which is directly countered by the vast bulk of research ^[25] and even Skinner himself held that no serious student of behavior has ever held this position ^[26]
 - Direct and continuous measurements enable practitioners to detect small improvements in performance that might have otherwise been missed
 - As a practitioner uses behavioral techniques with positive outcomes, the more they will become optimistic about future success prospects^[21]
 - The literature provides many examples of success teaching individuals considered previously "unteachable."

Our model of BHRS combines Full Fidelity Wraparound methodology with ABA principles and practices to create the most effective mental health treatment delivery modality possible for children in their homes, schools and communities. Independent researchers at UNC - Chapel Hill (2007), Thomas Jefferson University (2010), Villanova University (2012) and Immaculata University (2013) all found statistically significant associations between the delivery of BHRS by our staff and reductions in physical aggression, lack of environmental safety, noncompliance with adult prompts, communication deficits and socialization deficits in children between 2 and 19 years of age.

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We are a training facility for specialists in mental health treatment, evaluation and education of children

Operating since 1996 ***We help children with disabilities enroll in Medicaid to fund their treatment***

Affiliated with The Network for Behavior Change

The largest private practice of psychology in Pennsylvania that deals exclusively with children

Commendations from

US Congress

Both Houses of the PA legislature

The Centers for Medicare and Medicaid Services (CMS) overseeing the PA Medicaid Program

The President's New Freedom Commission on Mental Health

PA Psychological Association: Psychologically Healthy Workplace Award

- Outstanding employee development programs
- Exceptional employee retention

Currently staffing 132 cases (39 in Delaware Co., 20 in Montgomery Co., 38 in Chester Co., 35 in Phila.)

96% of TSS prescriptions are currently staffed with TSS providers

95% of TSS prescriptions are typically staffed with TSS within 5 days after receipt of MCO authorization

100% of BSC prescriptions are staffed with a BSC within 24 hours after receipt of MCO authorization

Total employees: 105 No "independent contractors" – all staff are bona-fide *employees*

Psychologists: 5 3 additional psychologists currently seeking affiliation with IBC
1 Certified School Psychologist

TSS Providers: 75 32% in Master's degree programs anticipating employment as a BSC/MT

BSC & MT Providers: 19 1 Licensed Behavior Specialist; all BSCs will be eligible for licensure

Administration: 6

Psychiatric and PCP consultations facilitated by BSC providers for psychotropic medication monitoring

15 hour pre-employment evaluation procedure yields excellent candidates for BSC, MT and TSS positions

We assist children with mental health disabilities in enrolling in Medicaid so that they can begin to receive access to treatment funding via the Early and Periodic Screening, Diagnosis and Treatment (EPSDT) mandate of the Medicaid Act. Children with mental illnesses and behavioral disorders are eligible for enrollment in Medicaid and EPSDT funding in Pennsylvania and 33 other states as a Civil Right *regardless of family income.*