



# Predicting Residential Treatment Outcomes for Emotionally and Behaviorally Disordered Youth: The Role of Pretreatment Factors

Wendy den Dunnen MEd , Jeff St. Pierre PhD CPsych , Shannon L. Stewart PhD CPsych , Andrew Johnson PhD , Steven Cook MA & Alan W. Leschied PhD CPsych

**To cite this article:** Wendy den Dunnen MEd , Jeff St. Pierre PhD CPsych , Shannon L. Stewart PhD CPsych , Andrew Johnson PhD , Steven Cook MA & Alan W. Leschied PhD CPsych (2012) Predicting Residential Treatment Outcomes for Emotionally and Behaviorally Disordered Youth: The Role of Pretreatment Factors, Residential Treatment for Children & Youth, 29:1, 13-31, DOI: [10.1080/0886571X.2012.642268](https://doi.org/10.1080/0886571X.2012.642268)

**To link to this article:** <http://dx.doi.org/10.1080/0886571X.2012.642268>



Accepted online: 08 Dec 2011.



[Submit your article to this journal](#)



Article views: 274



[View related articles](#)



Citing articles: 1 [View citing articles](#)

## **Predicting Residential Treatment Outcomes for Emotionally and Behaviorally Disordered Youth: The Role of Pretreatment Factors**

WENDY DEN DUNNEN, MEd

*School of Psychology, The University of Ottawa, Ottawa, Ontario, Canada*

JEFF ST. PIERRE, PhD, CPsych

and SHANNON L. STEWART, PhD, CPsych

*The Child and Parent Resource Institute, London, Ontario, Canada*

ANDREW JOHNSON, PhD

*School of Health Studies, The University of Western Ontario, London, Ontario, Canada*

STEVEN COOK, MA

*Faculty of Sociology, The University of Toronto, Toronto, Ontario, Canada*

ALAN W. LESCHIED, PhD, CPsych

*Faculty of Education, The University of Western Ontario, London, Ontario, Canada*

*This study examined outcomes with 170 children and youth admitted to residential treatment with complex mental health problems. Overall, outcomes at 2 years post-treatment was predicted by children and youth's behavioral pretreatment status reflected in lower internalizing and externalizing behavior at admission. These findings recognize a cluster of variables upon admission that are differentially predictive of specific outcomes. Higher school participation/achievement and an absence of witnessing interparental abuse predicted educational status. Family status was predicted at admission by higher family functioning, being younger in the family, and children and youth who had poor community behavior. The results are discussed as they relate to pretreatment screening and the need to evaluate service outcomes.*

---

Address correspondence to Alan W. Leschied, PhD, CPsych, Faculty of Education, The University of Western Ontario, 1137 Western Road, London, Ontario, Canada, N6G 1G7. E-mail: leschied@uwo.ca

*KEYWORDS* residential treatment, mental health, academic achievement, family functioning, children and youth

Residential treatment provides tertiary care for children and youth with complex mental health, educational, social, and behavioral difficulties (St. Pierre, Stewart, Cullion, & Leschied, 2008). Outcome studies have shown that many children and youth at high-risk for poor long-term life course trajectories show positive gains from residential treatment (e.g., Hussey & Guo, 2002; Gorske, Srebalus, & Walls, 2003; Lyons, Terry, Martinovich, Peterson, & Bouska, 2001). However, Hair (2005) cites that numerous pretreatment factors, as well as within treatment variables, may help characterize differential treatment outcomes. The influence of pretreatment client variables can be characterized as evidence for resilience (The Child and Family Partnership, 2010, p. 9). Knowledge related to resilience can be useful in appreciating factors that account for differential treatment outcomes and the extent to which successful outcomes capitalize on the pretreatment circumstances with which children and youth present to a residential treatment facility. This study related pretreatment factors to outcome within a sample of seriously emotionally and behaviorally disordered youth who experienced an average of four months of intensive residential treatment.

Outcome studies examining youth who experience residential treatment have typically examined broad treatment effects across a number of treatment centers (e.g., Lyons et al., 2001; Connor, Miller, Cunningham, & McIloni, 2002; Helgerson, Martinovich, Durkin, & Lyons, 2007). Although these studies have not specifically examined pretreatment factors for children and youth that are linked to outcome, they have identified factors that distinguish residents who respond positively to treatment from those who do not show improvement.

#### SINGLE VERSUS MULTIPLE OUTCOMES AS PREDICATORS OF RESILIENCE

Greenbaum et al. (1996) identified that there was an increase in accuracy of the prediction of treatment-related outcomes when considering multiple indicators such as gender, age at the time of discharge, ethnic status, adequacy of communication skills, level of internalizing behavior, police contact with the family, and family adaptability. Sunseri (2004) used multiple outcome measures including program completion, restrictiveness of the discharge environment, and an index of behavior change in relation to the outcome of family functioning.

Research has also focused on single variable outcomes, which offer only a modest representation of resilience. Sunseri's (2001) work distinguished program completers from noncompleters through their histories of substance abuse, running away, past experience with physical restraints

or seclusion, parental mental illness, and previous failed residential care placements. Frankfort-Howard and Romm (2002) followed 42 individuals discharged from residential treatment for one year noting that individuals not diagnosed with an antisocial disorder, were, as adults, less likely to have a learning disability or attentional problems, less likely to have experienced abuse or neglect, abuse drugs or alcohol, or come into contact with police. In relation to family characteristics, the improved group was less likely to be separated from their family prior to the age of 10 and have parents who had histories of abusing drugs or alcohol. Hussey and Guo's (2002) examination of 57 children ages 5 to 13 years revealed that those with a low number of out-of-home placements, those with higher IQ scores, those who were older (over the age of 10), and males had lower levels of later symptomatology.

Although the aforementioned studies focused on one outcome measure, the number of pretreatment factors associated with the treatment outcome reflected the complexity of appreciating resilience within this group. Connor et al. (2002) examined mental health symptomatology as the outcome indicating that children and youth with lower internalizing scores, with an absence of sexual and/or physical abuse, and who were older (over 5 years of age) when they experienced their first out-of-home placement had better outcomes. However, when a single, global outcome measure was used, the only variable predictive of improvement was the absence of a history of physical and/or sexual abuse. Gorske et al. (2003) noted the importance of family involvement and support, less severe problems in the community, and living at home prior to treatment in differentiating the nature of treatment outcome.

Following the trend of examining the role of family in residential treatment outcomes, Hussey and Guo (2005) examined child and family characteristics related to the time of discharge from treatment. Children who were older and not on medication tended to remain in treatment for shorter periods of time. In contrast to previous work however, this study revealed outcome to be independent of parental characteristics.

#### LENGTH OF FOLLOW-UP

Few studies have examined long-term outcomes following child inpatient or residential mental health treatments. Green et al. (2007) addressed this limitation in determining if treatment results were maintained one year following discharge, reflecting that higher baseline family functioning at admission predicted improved outcomes at follow-up.

Research into residential treatment also varies in the nature of what is being considered at follow-up period, with the majority of studies focused on treatment completion, length of treatment, and type of discharge setting. More comprehensive studies examine a variety of relevant outcome measures such as behavioral and/or educational functioning beyond the point

of discharge. Inconsistency in outcome measures is likely partially responsible for the varied results across studies. In addition, these studies focused on different pretreatment factors in the individual, family, and educational domains. Table 1 summarizes selected outcome studies in residential treatment that provide an analysis of predictor variables at admission in relation to outcome.

## CURRENT STUDY

In their study on the impact of a tertiary care treatment provider with seriously emotionally and behaviorally disordered children and youth, St. Pierre and colleagues (2008) addressed many of the limitations of past research by using a large sample, a variety of standardized measures reflecting outcome, and an evaluation at a two-year follow-up period post-discharge. Data from the St. Pierre et al. study served as the basis for the current research in examining multiple forms of resilience. Based on previous research, three categories of pretreatment factors were included as predictors related to outcome. These included measures within the individual, family, and education domains. The choice for each pretreatment factor was made based on identification in at least two previous published residential treatment outcome studies. Thus, the focus of prediction included the following: a history of abuse or neglect, age at separation from the family, indices of internalizing and externalizing behavior, and a measure of family functioning.

## METHOD

### Participants

Participants included consecutive admissions to a large tertiary care residential treatment center for children and youth between October 1, 2002 and July 1, 2006. Archival program evaluation data revealed 360 referrals were made, with 230 children beginning treatment during the period under study. Five of the participants voluntarily left treatment within the first two weeks of their stay and hence were excluded from the analysis. From the 225 remaining children and youth, 170 families (75%) completed a two-year follow-up telephone interview. Out of the 55 families who did not complete this interview, 11 (5%) had moved and could not be reached, 29 (13%) were contacted but did not respond, and 16 (7%) refused to participate. In a logistic regression analysis, the original study found no statistically significant differences between the sample of 170 children and youth and the 55 individuals who did not participate in the long-term follow-up with regard to sex, age at admission, length of admission, child welfare status, and referral severity (St. Pierre et al., 2008).

**TABLE 1** Summary of the Predictor Variables Identified by Previous Outcome Studies

Study	Length of follow-up	Sample type	Outcome measure	Predictor of better outcomes
Connor et al. (2002)	Discharge (no follow-up)	$n = 87$ Age range = 5–18	Devereux Scales of Mental Disorder (lower levels of psychopathology)	<ul style="list-style-type: none"> <li>- lower internalizing scores</li> <li>- absence of sexual and/or physical abuse</li> <li>- children who were older (over 5 years of age) when experienced first out of home placement</li> <li>- absence of physical and/or sexual abuse</li> </ul>
Frankfort-Howard and Romm (2002)	1 year	$n = 42$ Age range = 14–18	Clinical Global Impression (more adaptive behavior) Absence of antisocial outcomes as adults	<ul style="list-style-type: none"> <li>- absence of learning disability or attentional problems</li> <li>- absence of abuse or neglect, abuse of drugs or alcohol, and arrests</li> <li>- separated from family after the age of 10</li> <li>- absence of parents who abuse drugs or alcohol</li> <li>- less severe problems in the community</li> <li>- lived at home prior to treatment</li> <li>- high family support</li> <li>- higher family functioning</li> </ul>
Gorske et al. (2003)	Discharge (no follow-up)	$n = 150$ Age range = 13–20	Clinician-rated treatment effectiveness measure (successful)	
Green et al. (2007)	1 year	$n = 150$ Age range = 3–14	Childhood Global Assessment Scale (CGAS) (adaptive behavior)	

*(Continued)*

**TABLE 1** (Continued)

Study	Length of Follow-up	Sample Type	Outcome Measure	Predictor of Better Outcomes
Greenbaum et al. (1997)	7 years	<i>n</i> = 812 Age range = 9–17	Delinquent Behavior (absence of incarceration)	<ul style="list-style-type: none"> <li>- younger age (aged 8 to 14 years), female gender</li> <li>- lower levels of externalizing behavior</li> <li>- absence of family history of contact with police</li> <li>- older at the time of discharge, non-minority</li> <li>- presence of functionally adaptive families</li> <li>- better communication skills</li> <li>- lower levels of internalizing behaviors</li> <li>- female gender, higher IQ</li> <li>- above median social economic status</li> <li>- lower externalizing behavior</li> <li>- absence of a criminal offense history and family history of school, emotional/behavioral problems, or alcohol/drug-related problems</li> <li>- above average on school competence measures</li> </ul>
			Less restrictive placement	
			Remaining in school	

Hussey and Guo (2002)	Discharge (no follow-up)	$n = 57$ Age range = 5–13	Devereux Scales of Mental Disorders (lower levels of psychopathology)	- older age - male gender - lower IQ
Stage (1998)	Discharge (no follow-up)	$n = 130$ $M$ age = 14.67	Post-treatment placement (less restrictive)	- absence of family histories of criminal behavior and substance abuse problems
Sunseri (2001)	1 year from admission to treatment	$n = 313$	Treatment completion	- absence of substance abuse, running away, physical restraints or seclusions, parental mental illness, and previous failed residential care placements - higher family functioning - higher family functioning
Sunseri (2004)	Discharge (no follow-up)	$n = 8,933$	Treatment completion Restrictiveness of Living Environments Scale (ROLES; less restrictive) Childhood Global Assessment Scale (CGAS) (adaptive behavior)	- higher family functioning



A review of the 170 participants revealed a mean age at the time of admission of 11.26 years ( $SD = 2.46$ ) with a range of 6 to 17 years. Seventy-nine percent of the participants (135 children and youth) were male and 21% (35) were female.

## Pretreatment Factors

The sample characteristics in relation to the majority of the factors that were identified are summarized in Table 2. Not all variables assessed were available for the entire sample and hence sample sizes for certain variables were less than 100%.

## Procedure

### THE TREATMENT PROGRAM

Children and youth admitted into this tertiary care mental health facility receive assessment, treatment, and individual care plans developed collaboratively by the family/guardian, community case manager, and

**TABLE 2** Pretreatment Factor Characteristics of Children and Youth

Factor	<i>n</i>	% Yes	Minimum	Maximum	Mean
Maltreatment history					
Physical abuse	145	31.2			
Sexual abuse	139	18.2			
Neglect	168	25.9			
Witnessed abuse	167	55.9			
Substance use (0 minimal to 30 severe)	170	11.8	0	30	2.18
Internalizing behavior <i>T</i> score	169		37	101	70.82
Externalizing behavior <i>T</i> score	169		58	107	82.43
Poor community role (0 minimal to 30 severe)	170		0	30	11.82
Family functioning <i>T</i> score	156		48	146	102.71
Family support (0 minimal to 30 severe)	93		0	30	11.08
Informant alcohol use (1 strongly agree to 4 strongly disagree; 5 don't know)	134	1.8			4.02
Partner alcohol use (1 strongly agree to 4 strongly disagree; 5 don't know)	114	1.8			4.25
Number of out of home placements	170		0	10	2.14
School achievement <i>T</i> score	165		43	113	80.44

*Note.* Family maltreatment and alcohol history, and *T* scores of standardized parent report obtained from the Brief Child and Family Phone Interview (BCFPD); the three 0 to 30 indices of risk obtained from standardized clinician ratings on the Child and Adolescent Functional Assessment Scale (CAFAS).

clinicians at the center. This mental health residential program consists of five cottage-like psychiatric inpatient units: three child units and two adolescent units. Units offer generic rather than disorder-specific services. Each unit accepts a range of disorders, separated by age and gender. Treatment models that are used draw upon structured behavioral milieu and individualized intervention strategies. Treatment efforts, guided by unit psychologists and psychiatrists, emphasize multimodal clinical assessment, milieu therapy, adaptive skill development, parent training and family counseling, and coordinated discharge planning. The living milieu promotes interpersonal skill development, with concomitant psychotropic medication and psychosocial, family-oriented, and educational interventions. An on-site school offers an individualized, special education environment. The average length of stay was 4 months, and in-home outpatient services were offered during the immediate post-discharge period.

#### MEASURES

Data collection reflected multiple perspectives: parent/guardian and clinicians completed standardized measures at preadmission (Time 1) and parent/guardian perceptions of the benefit from the treatment for their child were obtained at 2-years post-discharge (Time 2). Standardized measures included the Child and Adolescent Functional Assessment Scale (CAFAS) and the Brief Child and Family Phone Interview (BCFPI). Treatment outcomes were reflected in the follow-up scores at Time 2 from the two measures that are described in the following section.

*The Brief Child and Family Phone Interview (BCFPI).* The BCFPI is a semistructured phone interview conducted with the caregiver by a clinical interviewer (Boyle et al., 2008; Cunningham, Boyle, Hong, Pettingill, & Bohaychuk, 2008). There are seven subscales that measure common childhood problems. Two of these subscales relate to Externalizing Behavior (Regulating Attention, Impulsiveness and Activity Level, Cooperativeness, and Conduct) and Internalizing Behavior (Separation from Adults, Managing Anxiety, and Managing Moods). The remaining subscales are Impact on Child Functioning (Child's Social Participation, Quality of Social Relationships, and School Participation and Achievement), Impact on Family (Family Activities and Family Comfort), Barriers to Service Utilization, and Readiness for Change. This study uses the population norm *T* scores of the BCFPI, where scores above 70 on the subscales are considered in the clinical range (Barwick, Boydell, Cunningham, & Ferguson, 2004). The reliability of this scale is considered good. The Cronbach's alpha ranges from .73 to .85 on the Ontario Child Mental Health Study Scales-Revised clinical sample for all scales (Cunningham et al., 2008).

*The Child and Adolescent Functional Assessment Scale (CAFAS).* The CAFAS is a commonly used multidimensional rating of risk level of

functioning commonly used across numerous programs. This measure is mandated by the province within which this study was conducted. Clinicians rate a child/youth's impaired or restricted functioning within the home, school, and family domains. There are eight subscales of functioning: school or work, home, community, behavior toward self and others, moods and emotions, self-harmful behavior, substance use, and thinking. The behavioral descriptions (e.g., expelled from school) for each of these subscales are recorded on a four-level scale that increases in 10-point increments. The levels of impairment are severe (30), moderate (20), mild (10), and no or minimal (0). Subscale scores are combined to form a total score, ranging from 0 to 240 (Hodges, 2000). Hodges, Doucette-Gates, and Liao (1999) found that the CAFAS had an internal consistency of .73 at intake and .78 at 6 months for all subscales when examining youth in residential treatment using the CAFAS. The primary clinician working with the family completed the CAFAS. For the long-term follow-up investigation (Time 2), which was done over the phone, the interviewers asked several questions about seminal life events (e.g., "Has your child been suspended from school?") in addition to those found in the BCFPI, so the CAFAS rating of functioning could also be completed (St. Pierre et al., 2008). All CAFAS raters in this investigation passed the CAFAS certification training to ensure reliability of ratings.

## Analysis

Stepwise multiple regression examined correlations between the pretreatment variables at Time 1 and child and youth functioning at Time 2. Based on previous research, it was hypothesized that factors in the three categories (individual, family, and education) would distinguish the children and youth in their improved functioning at Time 2. This analysis, which accounts separately for the variance by each predictor variable or combination of variables on the dependent variable allows for discussion of the relative degree of contribution of each of the predictor variables with the outcome at Time 2. Statistical analyses were completed on the entire sample of 170 children and youth. However, the sample size for each analysis varied as a function of missing data, as not all family participants completed all subscales of the BCFPI. Three categories of dependent variables were examined: behavioral, educational and family outcomes. The outcome measures for the behavioral category included subscales from the Externalizing Behavior, Internalizing Behavior, and Global Functioning indices at 2-years post-discharge on the BCFPI. The measure for educational outcomes was based on the subscale of School Participation and Achievement from the BCFPI. Finally, the subscale Global Family Situation on the BCFPI was used to measure family outcomes. An experiment-wise alpha of 0.05 was maintained for all analyses.

## RESULTS

### Pretreatment Factors

The pretreatment factors included age and the number of out-of-home placements, a history of physical and sexual abuse, neglect, witnessing abuse, informant alcohol and partner alcohol use, school participation and achievement, externalizing and internalizing behavior, and family functioning assessed by parent report on the BCFPI, as reported in Table 2. Substance use and community role performance at preadmission were assessed through the CAFAS. Parental support and age at first out-of-home placement could not be examined due to sample size and data limitations.

### BEHAVIORAL OUTCOMES

Stepwise multiple regression examined the predictive accuracy of the 14 identified pretreatment factors on the behavioral outcome measures at 2-years post-discharge (see Table 3). An absence of abuse or neglect and higher family functioning were not related to improved behavioral outcomes for any of the behavioral outcome measures examined.

### EXTERNALIZING OUTCOMES

Externalizing behavior ( $\beta = .42, p = .001$ ) and school participation and achievement ( $\beta = .19, p < .05$ ) at preadmission were significantly related

**TABLE 3** Summary of Stepwise Multiple Regression Analysis for Predicting Behavioral Outcomes

Time 1 BCFPI and CAFAS	Behavioral Outcome Measure								
	Externalizing behavior			Internalizing behavior			Global functioning		
	$\beta$	$p$	$R^2$ Change	$\beta$	$p$	$R^2$ Change	$\beta$	$p$	$R^2$ Change
Constant	22.74	.06	–	12.30	.12	–	13.37	.32	–
Externalizing	0.42	.00	0.11	–	–	–	–	–	–
Internalizing	–	–	–	0.51	.00	0.28	–	–	–
Global functioning	–	–	–	–	–	–	0.39	.001	0.10
Partner alcohol use	–	–	–	3.97	.03	0.04	5.95	.004	0.08
School achievement	0.19	.02	0.06	–	–	–	–	–	–
$R^2$	–	–	0.17	–	–	0.32	–	–	0.18

Note.  $n = 88$  for externalizing behavior outcome data;  $n = 87$  for internalizing behavior outcome data;  $n = 86$  for global functioning outcome data. Degrees of Freedom = 1. 2-years post-discharge.

to externalizing behavior at 2-years post-discharge. Parent/guardian report of externalizing behavior at admission accounted for 11% of the variance of parent/guardian report of externalizing behavior post-discharge. School participation and achievement added another 6% to the total variance. These results reflect that marginally lower externalizing scores and higher school participation and achievement prior to treatment accounted for 17% of the variance with externalizing scores 2 years after treatment.

#### INTERNALIZING BEHAVIOR

The variables most predictive of parent/guardian reported internalizing behavior outcomes at Time 2 included reported internalizing behavior at admission ( $\beta = .51, p < .001$ ) and partner alcohol use ( $\beta = 3.97, p < .05$ ) at Time 1. Internalizing behavior accounted for 28% of the variance, followed by partner alcohol use, which accounted for a modest 4% of the variance. The finding that the presence of partner alcohol abuse was related to lower internalizing scores needs to be interpreted with caution given that only 2% of the caregivers' partners engaged in excessive alcohol use and the variable was not normally distributed. As a result, this finding may be a result of a Type II statistical error rather than an actual reality of children and youth with severe mental health disorders.

#### GLOBAL FUNCTIONING

An examination of global child functioning yielded two significant predictor factors. Time 1 global functioning ( $\beta = .28, p < .01$ ) and partner alcohol use ( $\beta = 5.57, p = .001$ ) were both predictive of global functioning at 2-years post-discharge. Global functioning accounted for 10%, followed by partner alcohol use, which accounted for 8%.

#### EDUCATIONAL OUTCOMES

Sexual abuse ( $\beta = -1.40, p < .05$ ), school participation and achievement ( $\beta = .31, p < .001$ ), and witnessing abuse ( $\beta = .64, p < .001$ ) at preadmission predicted 23% of the variance in relation to school participation and achievement at 2-years post-discharge (Table 4). Separately, sexual abuse accounted for 10% of the variance, school participation and achievement, with 8% of the variance, and witnessing abuse accounted for 4%. The finding that sexual abuse predicted higher educational competence needs to be interpreted with caution. This variable was entered into the regression equation as a dichotomous variable that was not normally distributed as only 12% of the sample had experienced sexual abuse. Therefore, this finding may be

**TABLE 4** Summary of Stepwise Multiple Regression Analysis for Predicting Educational and Family Outcomes

Time 1 BCFPI and CAFAS	School participation and achievement			Global family situation		
	$\beta$	$p$	$R^2$ Change	$\beta$	$p$	$R^2$ Change
Constant	47.72	.00	–	65.30	.00	–
Sexual abuse	–1.40	.00	0.10	–	–	–
School achievement	0.31	.00	0.08	–	–	–
Witnessed abuse	0.64	.04	0.04	–	–	–
Family situation	–	–	–	0.46	.00	0.10
Age	–	–	–	–2.12	.04	0.06
Community role	–	–	–	–0.47	.05	0.05
$R^2$	–	–	0.23	–	–	0.21

Note.  $n = 84$  for school participation and achievement outcome data;  $n = 76$  for global family situation outcome data. Degrees of Freedom = 1.

explained by statistical error of the analysis rather than a protective factor for children and youth with serious emotional and behavioral disorders,

#### FAMILY OUTCOME MEASURE

Three pretreatment factors predicted the global family situation, accounting for 21% of the variance (see Table 4). Time 1 global family situation ( $\beta = .46$ ,  $p = .001$ ) related positively, while age ( $\beta = -2.12$ ,  $p < .05$ ), and community role performance ( $\beta = -.47$ ,  $p < .05$ ) at preadmission were related negatively to global family situation at 2-years post-discharge. Global family situation accounted for 10% of the variance, age accounted for 6%, followed by difficult community role performance, accounting for 5% of the variance.

#### DISCUSSION

Lower externalizing and internalizing scores and higher school participation and achievement predicted better behavioral outcomes 2 years following treatment. The more likely a young person had higher school participation and achievement and an absence of witnessing abuse, the higher were their educational outcomes at follow-up. Finally, family outcomes 2 years post-treatment was predicted by higher family functioning, being a younger child relative to the overall sample, and having a less adaptive community role at admission.

## Behavioral Outcomes

The first hypothesis explored the presence of a history of abuse or neglect and lower internalizing scores and higher family functioning with adaptive behavior. Although lower parent rated mood and anxiety scores predicted more adaptive behavioral outcomes, the absence of abuse and the presence of higher family functioning were, inconsistent with previous research, not associated with behavioral resilience. It was found that lower internalizing and externalizing behaviors, children and youth with caregivers with alcohol abuse problems, and higher school achievement were predictive of better behavioral outcomes with children and youth at risk for poor outcomes.

In the broader, nonresidential treatment literature, there is considerable evidence for the continuity of child and youth behavior problems (e.g., Heijmens Visser et al., 1999). Previous research has supported the finding that lower externalizing and internalizing behaviors are predictive of better outcomes in relation to behavior (Connor et al., 2002; Fergusson & Horwood, 1995; Greenbaum et al., 1996). The present results also converge with previous research examining the role of education and behavior with behavioral outcomes of children and youth following residential treatment (Fergusson, Beautrais, & Horwood, 2003; Fergusson & Horwood, 1995; Tiet et al., 2001; Williams, Macmillan, and Jamieson, 2006). For example, Fergusson and Horwood (1995), in the longest outcome study to date relating pretreatment scores to outcome, reported that adaptive behavior, and higher IQ scores in childhood predicted more adaptive behavior in adolescence.

An unexpected finding related lower externalizing and internalizing problems as protective factors for children exposed to parental alcohol abuse. However, in addition to the statistical limitations mentioned earlier, the variance accounted for by this factor was relatively small suggesting there may be other factors related to the outcomes with these children. For example, do parents who rate alcohol as a problem for themselves or a spouse alter their severity rating for the child's presentation? An alternate explanation may be that children who have parents with alcohol problems may be more "parentified" and reflect short-term pseudo maturity in their adjustment. It needs also to be acknowledged however that there may be an inherent statistical bias in relating pretreatment scores with the same measure at a subsequent time period, as participants with lower scores at Time 1 will inherently have lower scores at Time 2; participants with higher scores at Time 1 will continue to show higher scores at Time 2.

## Educational Outcomes

The second hypothesis that low externalizing behavior would be an influential protective factor in educational outcomes was not supported.



Higher school participation and achievement was predicted however by the presence of sexual abuse, higher school participation and achievement at preadmission, and an absence of witnessing interparental abuse. A recent study by Shelble, Franks, and Miller (2010) highlights the complexity of the relationship between abuse and school achievement. This study examined the relationship between maltreatment and academic achievement for children and youth, using emotion dysregulation as a pretreatment factor. This study found that maltreated children who also had high emotion dysregulation had worse educational achievement. Maltreated children and youth who were able to regulate emotions had better educational outcomes. This study indicates that there are additional factors at play in the relationship between maltreatment and educational resilience. Without replication of the results, the current study is unable to provide additional information about the relationship between sexual abuse and educational achievement due to statistical limitations. Future research is needed to examine the effects of sexual abuse on educational outcomes in the residential treatment population.

Research does support the finding that witnessing abuse within the family has negative effects on academic achievement. Thompson and Massat (2005) reported that witnessing family violence, along with the presence of PTSD, predicted lower academic achievement. Improving academic achievement in early childhood may mitigate the vulnerability of poor outcomes for children who have witnessed abuse in regards to fostering educational outcomes.

### Family Outcomes

The third hypothesis, that certain pretreatment factors would predict family functioning, was supported. Higher family functioning, being a younger child within the family, and children and youth with poor behavior within the community prior to admission predicted better family functioning post-discharge. Family functioning and support are important predictors of outcome for children in tertiary care (Gorske et al., 2003; Green et al., 2007; Greenbaum et al., 1996; Sunseri, 2004) and in the general developmental psychopathology literature (Tiet et al., 2001; Greenbaum et al., 1996; Coyle et al., 2009). Early adaptive family functioning continues to be a particularly important factor in the prediction of better family outcomes. Surprisingly, children with less adaptive behavior in the community at preadmission had better familial outcomes. These findings indicate that for children who have less adaptive community behavior, higher family functioning acts as a protective factor and may counteract more negative behavior within the community. It is also possible that families with higher functioning at preadmission were better able to apply the skills they learned in treatment to help manage their children's emotional and behavioral problems. The skills learned may be particularly beneficial at addressing problem behavior within



the community. This finding may also be a direct result of the treatment these children received. Previous research has found that residential treatment settings are successful at reducing behavioral problems (Green et al., 2007; St. Pierre et al., 2008). If problem behavior, particularly in the community, is the primary reason the child/youth are having familial difficulties, then the behavioral improvement may also improve familial relations.

### Study Limitations

This study addressed numerous methodological issues relative to previous research examining resilience in residential treatment populations including drawing on a larger sample size, using a broader range of pretreatment factors and outcome measures, along with employing a two-year post-treatment follow-up. However, it is not without limitations. One inevitable limitation in all residential treatment studies is the lack of a control group. Using control groups in studies with children and youth in need of the most intensive treatment remains an ethical challenge. Also, this study used a sample from a single residential treatment facility. Drawing on additional treatment sites would allow for increased generalization of the results. Lastly, not all the variables examined in the analyses were normally distributed, particularly the variables for parental alcohol use and the sexual abuse. Hence, interpretation of the findings as they may relate to other residential treatment sites needs to be made with caution. Finally, as stated in a previous section, interpretation of these findings need to account for the effects of pretreatment measures that are used as benchmarks for the follow-up on the same measure that may reflect spurious correlations based on the measure at Time 1.

### Summary of Findings

The combination of preadmission factors most predictive of positive child and youth outcomes two years following a mental health residential treatment stay included lower internalizing, externalizing, and overall problem behaviors as reported by parents, along with higher school achievement. Higher school achievement and an absence of witnessing abuse were protective factors for school achievement. Higher family functioning, being a younger child within the family, and less adaptive behavior in the community were predictive of better family outcomes. The protective factors that were most highly related to positive treatment outcomes included greater adaptive behavior, higher school achievement, and higher family functioning. These findings suggest the importance of improving these aspects in children and youth and their families to increase the likelihood of better behavioral, educational, and familial outcomes.

These findings highlight the multifactorial nature of the relationship between pretreatment measures with seriously emotionally and behaviorally disordered children and youth and outcomes two years following discharge. It is important for treatment planning in residential treatment settings to be particularly aware of these variables in appreciating results from treatment that can be accounted for not only by within treatment factors, but also for the child and their family's characteristics prior to admission to residential treatment. Numerous protective factors are interrelated and promote resilience across domains. A multisystemic focus dedicated to strengthening individual, family, and community factors will help children and youth attain and maintain positive treatment effects (Letourneau et al., 2009) and future research should examine the various domains of resilience rather than focusing specifically on behavioral outcomes within the residential treatment population.

Finally, we have become increasingly aware of the high rate of trauma in the lives of children and youth referred to residential treatment centers (RTCs) such as the one under study in this review. Recent data from this RTC suggests that close to one third of the children and youth are admitted through a child welfare agency. At a minimum then, one third of these residents will have experienced some form of violence through physical and/or sexual maltreatment, neglect, or exposure to interparental violence prior to their residential stay. A recent review of the literature regarding effective mental health treatment with traumatized youth reports that trauma-focused intervention is a necessary component of service for children and youth while they are in RTCs (Stewart, Leschied, den Dunnen, Zalmanowitz, & Baiden, 2011).

## REFERENCES

- Barwick, M., Boydell, K. M., Cunningham, C. E., & Ferguson, H. B. (2004). Overview of Ontario's screening and outcome measurement initiative in children's mental health. *Journal of the Canadian Academy of Child and Adolescent Psychiatry, 13*, 105–109.
- Boyle, M. H., Cunningham, C. E., Georgiades, K., Cullen, J., Racine, Y., & Pettingill, P. (2008). The Brief Child and Family Phone Interview (BCFPI): 2. Usefulness in screening for child and adolescent psychopathology. *The Journal of Child Psychology and Psychiatry, 50*(4), 424–431.
- Connor, D. F., Miller, K. P., Cunningham, J. A., & McIloni, R. H. Jr. (2002). What does getting better mean? Child improvement and measure of outcome in residential treatment. *American Journal of Orthopsychiatry, 72*, 110–117.
- Coyle, J. P., Nochajski, T., Maguin, E., Safyer, A., DeWit, D., & Macdonald, S. (2009). An exploratory study of the nature of family resilience in families affected by parental alcohol abuse. *Journal of Family Issues, 30*(12), 1606–1623.

- Cunningham, C. E., Boyle, M. H., Hong, S., Pettingill, P., & Bohaychuk, D. (2008). The Brief Child and Family Phone Interview (BCFPI) 1: Rationale, development, and description of computerized children's mental health intake and outcome assessment tool. *The Journal of Child Psychology and Psychiatry*, *50*(4), 416–423.
- Fergusson, D. M., Beautais, A. L., & Horwood, L. J. (2003). Vulnerability and resiliency to suicidal behaviors in young people. *Psychological Medicine*, *33*, 61–73.
- Fergusson, D. M., & Horwood, L. J. (1995). Early disruptive behavior, IQ, and later school achievement and delinquent behavior. *Journal of Abnormal Child Psychology*, *23*(2), 183–199.
- Frankfort-Howard, R., & Romm, S. (2002). Outcomes of residential treatment of antisocial youth: Development of or cessation from adult antisocial behavior. *Residential Treatment for Children and Youth*, *19*, 53–70.
- Gorske, T. T., Srebalus, D. J., & Walls, R. T. (2003). Adolescents in residential centers: Characteristics and treatment outcomes. *Children and Youth Services Review*, *25*, 317–326.
- Green, J., Jacobs, B., Beecham, J., Dunn, G., Kroll, L., Tobias, C., & Briskman, J. (2007). Inpatient treatment in child and adolescent psychiatry—A prospective study of health gain and costs. *Journal of Child Psychology and Psychiatry*, *48*, 1259–1267.
- Greenbaum, P. E., Dedrick, R. F., Friedman, R. M., Kutash, K., Brown, E. C., Lardieri, S. P., & Pugh, A. M. (1996). National adolescent and child treatment study (NACTS): Outcomes for children with serious emotional and behavioral disturbance. *Journal of Emotional and Behavioral Disorders*, *4*, 130–146.
- Hair, H. (2005). Outcomes for children and adolescents after residential treatment: A review of research from 1993 to 2003. *Journal of Child and Family Studies*, *14*(4), 551–575.
- Heijmens Visser, J., Koot, H. M., & Verhulst, F. C. (1999). Continuity of psychopathology in youths referred to mental health services. *Journal of the American Academy of Child & Adolescent Psychiatry*, *38*(12), 1560–1568.
- Helgerson, J., Martinovich, Z., Durkin, E., & Lyons, J. S. (2007). Differences in outcome trajectories of children in residential treatment. *Residential Treatment for Children and Youth*, *22*, 67–78.
- Hodges, K. (2000). *Child and Adolescent Functional Assessment Scale* (2nd Rev. ed.). Ypsilanti, MI: Eastern Michigan University.
- Hodges, K., Doucette-Gates, A., & Liao, Q. (1999). The relationship between the child and adolescent functional assessment scale (CAFAS) and indicators of functioning. *Journal of Child and Family Studies*, *8*, 109–122.
- Hussey, D. L., & Guo, S. (2002). Profile characteristics and behavioral change trajectories for young residential children. *Journal of Child and Family Studies*, *11*, 401–410.
- Hussey, D. L., & Guo, S. (2005). Forecasting length of stay in child residential treatment. *Child Psychiatry and Human Development*, *36*, 95–111.
- Letourneau, E. J., Henggeler, S. W., Schewe, P. A., Borduin, C. M., McCart, M. R., Chapman, J. E., & Saldana, L. (2009). Multisystemic therapy for juvenile sexual offenders: 1-year results from a randomized effectiveness trial. *Journal of Family Psychology*, *23*, 89–102.

- Lyons, J. S., Terry, P., Martinovich, Z., Peterson, J., & Bouska, B. (2001). Outcome trajectories for adolescents in residential treatment: A statewide evaluation. *Journal of Child and Family Studies, 10*, 333–345.
- Shelble, J. L., Franks, B. A., & Miller, M. D. (2010). Emotion dysregulation and academic resilience in maltreated children. *Child Youth Care Forum, 39*, 289–303.
- St. Pierre, J., Stewart, S., Cullion, C. M., & Leschied, A. W. (2008). *Differentiating three year outcomes following tertiary child and youth impatient psychiatric treatment*. Unpublished manuscript.
- Stage, S. A. (1998). Predicting adolescents' discharge status following residential treatment. *Residential Treatment for Children & Youth, 16*(3), 37–56.
- Stewart, S., Leschied, A., den Dunnen, W., Zalmanowitz, S. & Baiden, P. (2011). *Planning, access, and use of mental health services for youth in care: Review of the research literature*. London, ON, Canada: Child and Parent Resource Institute and The University of Western Ontario.
- Sunseri, P. A. (2001). The prediction of unplanned discharge from residential treatment. *Child and Youth Care Forum, 30*, 283–303.
- Sunseri, P. A. (2004). Family functioning and residential treatment outcomes. *Residential Treatment for Children and Youth, 22*, 33–53.
- The Child and Family Partnership. (2010). *Reaching In Reaching Out (RIRO)–MCYS Resilience Research Synthesis Review Project*. Waterloo, ON, Canada: Wilfred Laurier University.
- Thompson, T., & Massat, C.P. (1995). Experiences of violence, post-traumatic stress, academic achievement and behavior problems of urban African-American children. *Child and Adolescent Social Work Journal, 22*(5-6), 367–393.
- Tiet, Q. Q., Bird, H. R., Hoven, C. W., Wu, P., Moore, R., & Davies, M. (2001). Resilience in the face of maternal psychopathology and adverse life events. *Journal of Child and Family Studies, 10*, 347–365.
- Williams, S., MacMillan, H., & Jamieson, E. (2006). The potential benefits of remaining in school on the long-term mental health functioning of physically and sexually abused children: Beyond the academic domain. *American Journal of Orthopsychiatry, 76*(1), 18–22.