

Published in final edited form as:

*J Child Psychol Psychiatry*. 2006 November ; 47(11): 1133–1142. doi:10.1111/j.1469-7610.2006.01651.x.

## Which family factors predict children's externalizing behaviors following discharge from psychiatric inpatient treatment?

Joseph C. Blader

Department of Psychiatry and Behavioral Science, Stony Brook State University of New York, USA

### Abstract

**Objective**—Parents' behavior management practices, parental stress, and family environment are highly pertinent to children's conduct problems. Preadolescents' psychiatric hospitalization usually arises because of severe conduct problems, so the relationships of family-related variables to postdischarge functioning warrant investigation. This study examined postdischarge clinical course and select family factors to model outcomes via a) predictors measured at admission, b) predictors measured concurrently with outcome, and c) changes in predictor values from admission through follow-up.

**Method**—In a prospective follow-up of 107 child psychiatry inpatients, caregivers completed rating scales pertaining to their child's behavior, parenting practices, parenting stress, caregiver strain, and their own psychological distress at admission and three, six, and 12 months after discharge.

**Results**—The magnitude of reductions in parenting stress between admission and follow-up bore the strongest relationship to improvements in externalizing behavior. The largest and most sustained decreases in externalizing behavior arose among youngsters whose parents reported high parenting stress at admission and low parenting stress after discharge. By contrast, children whose parents reported low parenting stress at admission *and* follow-up showed significantly less postdischarge improvement. Parenting stress changes were not attributable to changes in behavioral symptoms. Parenting stress eclipsed relationships between behavior management practices and child outcomes, suggesting that parenting stress might have a mediational role.

**Conclusions**—High initial parenting stress disposed to better outcomes over the year of follow-up. Consistently low stress predicted less improvement. Higher stress at admission may imply more advantageous parent–child relationships or motivation for subsequent persistence with treatment. Interventions that ameliorate high stress may warrant further study. Low parenting stress might signify disengagement, or, alternatively, that parents of some chronically impaired children become rather inured to fluctuations in behavioral problems. If confirmed, further examination of these and other accounts for a relationship between low parenting stress and suboptimal child outcome seems warranted.

### Keywords

Behavior disorder; family processes; hospitalization; longitudinal studies; outcome; parenting; psychiatric services

The presenting problem that most often occasions the admission of preadolescents to inpatient psychiatric care is conduct disturbance, usually involving aggressive dyscontrol (Gutterman, 1998; Nicholson, Young, Simon, Fisher, & Bateman, 1998). These difficulties, often called externalizing behavior, manifest chiefly in the context of chronic disruptive behavior disorders and they typically develop alongside deficient impulse control and affective instability (Angold, Costello, & Erkanli, 1999; Burke, Loeber, Lahey, & Rathouz, 2005; Eisenberg, Fabes, Guthrie, & Reiser, 2000; Lynam, 1998).

Family factors occupy a prominent position in efforts to understand externalizing behaviors and their ramifications. Most obviously, interpersonal difficulties inhere in the symptom criteria for disruptive disorders, which emphasize behaviors toward others that are harmful, antagonistic, and in poor conformity with authority. Family members are most often on the receiving end of these behaviors (Loeber & Dishion, 1984; MacLeod, McNamee, Boyle, Offord, & Friedrich, 1999), and familial stress and discord are common repercussions (Angold et al., 1998; Burt, McGue, Krueger, & Iacono, 2005).

Parents' management of child behavior may influence the genesis or maintenance of conduct problems. Inconsistent, abrasive, or permissive discipline is prevalent, as is poor parent-child relationship quality (Burt et al., 2005; Thompson, Hollis, & Dagger, 2003). Stress engendered by the child's persistent behavioral difficulties may also undermine parents' capacity to apply measured discipline with composure and the mutual antagonism that results may further corrode the relationship to the point of chronic hostility and disengagement (Baker, Heller, & Henker, 2000; Barry, Dunlap, Cotten, Lochman, & Wells, 2005; Stoolmiller, 2001). Studies evaluating treatments that focus on improving parent-child relations and behavioral management demonstrate improvements in children's behavior (Beauchaine, Webster-Stratton, & Reid, 2005; Brestan & Eyberg, 1998; Scott, Spender, Doolan, Jacobs, & Aspland, 2001).

When a child's behavioral disturbance eventuates in psychiatric hospitalization, such interweaving of conduct problems with family factors suggests that strong relationships may exist between postdischarge outcomes and family variables. However, the nature and extent of such associations have been the subject of little study in this patient group. The few previous studies combined children with adolescents, did not assess change over time in family-relevant predictors, and did not consider multiple predictors in the same outcome-prediction models (Green et al., 2001).

The high cost (Ringel & Sturm, 2001), high patient risk (Lundy, Pfohl, & Kuperman, 1993; Sourander & Piha, 1998), and high rates of rehospitalization among preadolescents (Blader, 2004; Pottick, McAlpine, & Andelman, 2000) underscore the practical value of data that clarify their prognoses and focus treatment on areas likely to leverage favorable outcomes. Longitudinal measurements of family variables and clinical course can play a useful role in furnishing such data.

This study followed a cohort of 5–13-year-old children admitted to an acute psychiatric inpatient service. Assessments at admission, and three, six, and 12 months after discharge included measures of behavioral status, parenting practices, parenting stress, family environment, and parents' self-report of their own psychological symptoms. The primary goal was to develop a model of behavioral outcome vis-à-vis these family variables and their changes over time.

## Method

### Setting, participants, and recruitment

Participants were recruited from the guardians of children admitted to the 15-bed acute-care psychiatric inpatient service of a general pediatric hospital during a 14-month period. The catchment area straddles a large city and its suburbs, and draws a demographically diverse patient base.

Of 192 children admitted during this period, the families of 123 consented to participate in the follow-up study. Twenty others declined, 20 were unavailable for recruitment because of precipitous discharge, and 29 children were under the guardianship of foster care services that did not provide timely consent. Among those consenting, the study excluded 12 who withdrew, transferred directly to inpatient care elsewhere, or resided after discharge with a caregiver other than at admission. Another four had incomplete admission data and are not included in these analyses.

### Assessments

**Diagnostic assessment**—Structured assessment at admission included a) interviews with caregivers and children following a written outline with prompts that queried DSM-IV symptoms for specific disorders; b) telephone interviews and rating scales from teachers; and c) review of prior psychiatric records. Diagnoses were determined in case conferences involving at least two child psychiatrists, applying DSM-IV criteria.

### Family measures

**Parenting practices:** The *Alabama Parenting Questionnaire* (APQ; Shelton, Frick, & Wootton, 1996) asks respondents to rate the frequency of specific interactions involving their child, emphasizing behavioral management style. Subscales, with illustrative items, are parental involvement ('You play a game with your child'), low monitoring ('Your child is out with friends you do not know'), rewarding positive behavior ('You let your child know when he/she is doing a good job'), inconsistent discipline ('You threaten to punish your child and then do not punish him/her like you said'), and corporal punishment ('You spank your child with your hand when he/she has done something wrong').

**Parenting stress:** The *Parenting Stress Index* (PSI; Abidin, 1995) requests informants to rate their agreement with statements pertaining mostly to the emotional toll of raising a child, particularly one with behavioral difficulties (e.g., 'I feel trapped by my responsibilities as a parent', 'My child smiles at me much less than I expected', 'I expected to have closer and warmer feelings for my child than I do and this bothers me'). This study used the 36-item Short Form, which yields a total parenting stress score.

**Family environment:** Responses to the control and cohesion subscales of the *Family Environment Scale* (FES; Moos & Moos, 1994) characterize these two dimensions of family climate as a whole, rather than just interactions involving the 'target' child. Control subscale items reflect establishment of authority and order (e.g., 'There is a strong emphasis on following rules in our family', 'There are set ways of doing things at home'). Cohesion subscale items reflect warmth and quality of time together (e.g., 'Family members really help and support one another', 'Family members really back each other up').

**Caregiver strain:** The *Caregiver Strain Questionnaire* (CSQ; Brannan, Heflinger, & Bickman, 1997) gauges the impact of a youngster's disorder on the caregiver. Objective Strain concerns concrete adverse effects attributed to the child's disorder (e.g., 'Parent missing work or neglecting other duties because of your child's problems', 'Disruptions of family routines

due to your child's problems'). Subjective Strain emphasizes emotional reactions resulting from the child's difficulties, subdivided into those involving worry, depression, and guilt ('internalizing' reactions; e.g., 'How sad or unhappy did you feel as a result of your child's problems?'), and those involving anger ('externalizing' reactions; e.g., 'How angry did you feel toward your child?').

**Caregiver psychological symptoms:** The *Symptom Checklist-90-Revised* (SCL-90; Derogatis, 1994) asks respondents to rate how troubling they find each of 90 symptoms. The Total Score constitutes an index of overall distress.

**Behavioral disorder assessment—**Parents completed the *Child Behavior Checklist* (CBC; Achenbach, 1991), whose Behavior Problem section inquires about the frequency of 112 behaviors. This study considered as the chief outcome measure the Externalizing Behavior Score (CBC-Ext), which encompasses two narrower subscales, Aggressive Behavior (including volatile, disruptive, defiant, and physically/verbally abusive conduct) and Delinquent Behavior (emphasizing more willful violations of rules and other purposive antisocial conduct).

## Procedures

**Admission—**At admission, parents completed the CBC, PSI, APQ, CSQ, and FES. Diagnostic interviews with parents and children were conducted on the day of the child's admission.

**Postdischarge follow-up—**The week prior to scheduled assessments at 3, 6, and 12 months after discharge, research staff telephoned participating families. Following verification of current mailing address, assessment questionnaires were forwarded to families along with an envelope for their return. Further telephone contact confirmed receipt of these materials and provided any assistance in their completion and return.

## Statistical analysis

Mixed-model regression analyses evaluated changes in the family variables and outcome (CBC-Ext scores) over time (Bryk & Raudenbush, 1992). These analyses regard subjects as random variables in which assessment occasions are nested. Because the intervals between assessment times were unequal, analyses for quadratic time effects converted raw time units to orthogonal polynomials (Hedeker, Flay, & Petraitis, 1996). Raw CBC-Ext scores were used rather than *T* scores because standard scores obscure analyses of change (Rogosa, Brandt, & Zimowski, 1982).

Bivariate screening first considered each covariate alone with CBC-Ext. Covariates scores from admission whose regression coefficients had a *p* of .10 or lower were eligible for inclusion in the initial multivariable model. Covariate terms that retained significant associations with outcome were then joined by postdischarge covariate scores that had bivariate associations with outcome yielding *p*'s of .10 or lower.

## Results

### Sample characteristics

The sample comprised 107 children, whose average age was 9.43 years (s.d. = 2.18, range 5.11–13.62 years). Boys were 78% of the sample. Classification of ethnicity showed that 49.52% were white, 37.14% were black, 9.52% were Hispanic, and 3.81% were of mixed heritage. Most of the sample (79%) resided with a parent, 12.38% lived with other family members, and 8.57% with foster parents. Median inpatient length of stay (LOS) was 13 days.

Participants differed from nonparticipating patients only in the latter's higher proportion of children in foster care (22%).

Principal diagnoses at admission were categorized into five classes (mood, disruptive [including ADHD], anxiety, psychotic, and pervasive developmental disorders). The sample comprised 30% with disruptive disorder only; disruptive disorders occurred co-morbidly with a mood disorder for 36%, with an anxiety disorder among 7%, and with PDD (PDD not otherwise specified or Asperger's disorder) among 9%. Mood disorder alone was the principal diagnosis for 9%, anxiety only for 2%, PDD alone for 5%, and psychosis for 2%.

### Unconditional model for behavioral symptoms

The top row of Table 1 presents the sample's mean CBC-Ext scores over assessments. Mean scores decreased markedly from admission to the 3-month postdischarge follow-up and showed little change thereafter. Tests for time trends appear in the top row of Table 3. Both quadratic and linear terms are significant. The quadratic model provided a better fit than the linear-only model ( $\chi^2 = 251.4$ ,  $df = 1$ ,  $p < .001$ ).

**Covariate trends over time**—Table 1 contains the means for covariates and the results of random regression analyses that examined change over time. Analyses indicated significant improvements for every family-related factor except low monitoring, positive parenting skills, and stressful events.

**Bivariate associations between covariates and outcome**—There was no significant association between CBC-Ext and gender, age, ethnicity, diagnostic group, special education placement, and length of stay. However, the CBC-Ext scores of children who did not reside with their parents improved less during follow-up; though not attaining statistical significance, this variable met the threshold for inclusion in the multivariable model (Out-of-Home  $\times$  Time interaction:  $F [1,42] = 2.83$ ,  $p = .10$ ).

The left section of Table 2 presents the association between the *admission* values of family variables and outcome (i.e., time-stable covariates). The right section presents the association between family variables measured at *postdischarge follow-up* and concurrently-obtained outcome (i.e., time-varying covariates). Main effects for admission covariate scores indicate their association with overall level of CBC-Ext (i.e., effect on the intercept), and their interactions with Time indicate association with the change over the postdischarge period (i.e., effect on slope). The effects of three predictors obtained at admission on overall level of CBC-Ext met the threshold for inclusion in the multivariable model ( $p$  no greater than .10): parental involvement, low monitoring, and parental symptoms. The effect of one predictor, parenting stress, on rate of change in CBC-Ext also met this threshold; higher parenting stress at admission correlated with lower postdischarge CBC-Ext scores.

Several variables demonstrated significant associations with CBC-Ext when measured concurrently with outcome data (right-hand section of Table 2). Higher scores on postdischarge parental involvement and family cohesion correlated with lower CBC-Ext scores at follow-up. Higher scores on inconsistent discipline, corporal punishment, parenting stress, the three aspects of caregiver strain, and parent's own symptoms correlated with higher CBC-Ext scores.

### Multivariable model of outcome

Table 3 depicts the development of a combined-covariate model for behavioral outcome after discharge. All models include admission CBC-Ext and the linear and quadratic effects for Time (top of Table 3).

**Model with covariates' admission scores**—In the first combined model (second section of Table 3), only admission parenting stress retained an association with subsequent outcome, showing significant coefficients for both overall level (main effect) and change over time (interaction with Time). The combined model has an appreciably better fit to the data than the unconditional model.

**Model including covariates measured at follow-up assessments**—The third section of Table 3 shows the inclusion of covariates obtained contemporaneously with postdischarge CBC-Ext. This combined model includes covariates from Table 2 whose postdischarge values showed significant associations with outcome. Because all three CSQ factors had significant associations with CBC-Ext, this model included only the total CSQ score.

Lower scores on postdischarge parenting stress correlated with lower CBC-Ext at follow-ups, in contrast with the tendency for higher *admission* parenting stress scores to precede lower CBC-Ext ratings at follow-ups. Other family variables measured at follow-up that had significant bivariate associations with outcome were not significant in the combined model.

### **Model including change in parenting stress from admission to 3-month follow-up**

High parenting stress at admission and low parenting stress during follow-up made distinct contributions to predicting behavioral outcome. This suggests the possibility that the magnitude of the reduction in parenting stress between admission and follow-up is important to postdischarge outcome. To test this explicitly, another regression model included the difference between parenting stress at admission and 3-month follow-up.

The last section of Table 3 depicts this model, and shows the association between larger reductions in parenting stress and lower CBC-Ext scores at follow-up assessments. Thus, after adjusting for absolute levels of parenting stress at both admission and follow-up, the magnitude of the reduction in parenting stress between admission and follow-up was an influential covariate on postdischarge scores of behavior disorder. To reduce collinearity, we used only the difference between admission and 3-month parenting stress as a time-stable covariate for all postdischarge CBC-Ext assessments. Using the difference between admission and all follow-up parenting stress scores as a time-varying covariate yields the same result but also a less stable estimate of the admission parenting stress effect and its interaction with Time.

### **Predicting parenting stress from behavior change**

The last model suggests that reduced parenting stress may lead to improvements on behavioral problem ratings. Of course, reduced behavioral problem ratings might also lead to reduced parenting stress. Testing this latter possibility involves regressing parenting stress on change in behavioral ratings. The results of this analysis, in Table 4, show that a decline in externalizing behavior ratings between admission and 3-month postdischarge follow-up is unrelated to parenting stress during the follow-up period.

### **Behavioral ratings and parenting stress over time: group analyses**

To clarify these findings, Figure 1 displays the relationship between parenting stress and outcome. The groups shown in the figure result from dichotomizing parenting stress at admission and at 3-month follow-up as either above the median (high) or below the median (low), and then classifying parents' transitions between these groups or their stases within them over time. A transition from high to low or vice versa required both a shift in the score's categorization between assessment times *and* that the informant's score changed by more than two standard errors of the mean.



The most marked reductions in CBC-Ext appear for children whose parents transitioned from the high stress to the low stress group. Parents who had persistently high parenting stress score reported, unsurprisingly, the least advantageous child behavioral change through six-month follow-up, but this groups showed further improvement between six and 12 months. Parents who reported low stress both at admission and after discharge reported *less* reduction in their children's behavioral symptoms relative to those who went from high to low parenting stress. Random regression that controlled for admission CBC-Ext and SCI-90 scores (per last multivariable model) showed a significant overall difference between these two groups' CBC-Ext follow-up scores (main effect:  $F [1,53] = 4.08, p < .05$ ), and that the high-low group's rate of improvement was greater although shy of significance (group  $\times$  time interaction:  $F [1,53] = 3.63, p = .062$ ).

## Discussion

As a group, children hospitalized for severe behavioral difficulties exhibit considerable reduction in externalizing behavior symptoms in the year following discharge. A significant portion of individual patient variation around this group trend bears a strong relationship to a few family factors, most notably parenting stress. Findings suggest a) that larger reductions in parenting stress may promote greater improvements in behavioral problem ratings, b) greater behavioral improvement does not predict reduced parenting stress, and c) children whose parents reported low parenting stress at admission showed less improvement than those whose parents' stress shifted from high at admission to low at follow-up.

Parenting stress would seem, *prima facie*, a plausible impediment to the child's improvement, yet high parenting stress at admission portended greater improvement. Consistent with this result, two studies report fewer hospital readmissions for psychiatric disorders and for asthma-related emergencies among children whose parents reported higher stress at initial admission (Blader, 2004; Chen, Bloomberg, Fisher, & Strunk, 2003). Disclosures of higher stress could signify greater emotional involvement, reflecting aspects of parent-child relations that dispose to better outcomes or that impel parents to secure and persist with beneficial treatment. In a mixed child and adolescent inpatient sample, parental engagement at admission predicted better behavioral outcomes (Green et al., 2001). Our assessment of parenting stress bears similarity to the 'emotional overinvolvement' facet of the expressed emotion (EE) construct (Vaughn & Leff, 1976), which in some patient groups correlate with positive outcomes, while the critical and hostile elements of EE correlate with a more adverse clinical course (Baker et al., 2000; Butzlaff & Hooley, 1998; Hooley & Hoffman, 1999; van Os, Marcelis, Germeys, Graven, & Delespaul, 2001).

However, serial assessments of predictors and outcome revealed that sustained parenting stress is not advantageous. Moreover, the magnitude of the *reduction* in parenting stress between admission and follow-up predicted lower adjusted behavior disorder ratings.

Because parenting stress could be a by-product of a child's behavioral disorder, these findings might arise if reduced stress results from improved behavioral stability. However, reduced behavioral disturbance over time did not predict parenting stress at follow-up. Furthermore, parents who reported low parenting stress at both admission *and* follow-up also reported less improvement in their children's behavioral symptoms than parents who showed marked reductions in parenting stress over time. These results direct attention to the possibility that reduced parenting stress could be a significant influence on, rather than only a consequence of, improvements in children's behavioral functioning.

Alternatively, large changes in parenting stress from admission to follow-up might indicate that the child's condition at admission represented a particularly acute exacerbation for some

families. That is, parenting stress may have spiked with the onset of unusually severe circumstances. We would anticipate less severe symptoms after discharge as well as reversion of parenting stress scores. Similarly, parents whose children have chronically severe impairments may become somewhat inured to fluctuations in behavior so parenting stress is stable at a lower level. Evaluation of this important possibility necessitates data from a more typical period in the child's life preceding admission, apart from crises that may lead to hospitalization.

Assuming for the moment that reduced parenting stress itself does contribute to more favorable postdischarge course, we can consider possible mechanisms. The finding that postdischarge parenting stress eclipsed the influences of involvement with the child, inconsistent discipline, corporal punishment, caregiver strain, and family cohesion suggests that reduced parenting stress might attenuate these other adversities. Although the data at hand were more consistent with a mediational role for parenting stress, recent tradition would hold parent-child interaction and disciplinary practices as the more proximal influence on behavioral problems. Parent-training evaluation studies that related changes in outpatient behavioral management of externalizing problems to the adoption of more favorable interactions did not include parenting stress change as a candidate mediator (Beauchaine et al., 2005; Hinshaw et al., 2000), so there are limited data on this issue. Treatments that focus on improved behavioral management may plausibly promote change in parents' ratings by increasing parental confidence or feeling supported, and the resulting decrease in stress could set the stage for less friction or hostility in parent-child relations. One outpatient study (Kazdin & Whitley, 2003) found greater symptomatic improvement among children with behavior disorders whose parents had assistance with problem-solving in addition to parent management training, but parenting stress did not differentially improve. Study of the mechanisms by which psychosocial treatments produce beneficial changes awaits further progress, to which the present findings might be pertinent.

Parents' adaptation to the high stress associated with admission could have led to more successful access to and utilization of high quality postdischarge care. Most validated treatments for externalizing behavioral problems require strong parental commitment to examine and modify their interactions with the child. These can be arduous tasks with a long latency to payoff, and so may require a certain level of parental discomfort with the status quo to galvanize one's motivation. A more exacting approach to postdischarge service use, quality of care, and parenting practices could shed light on such pathways.

Among the clinical implications of these results, pending replication, assistance to parents with high stress could serve an important role in optimizing child functioning (Treacy, Tripp, & Baird, 2005). Similarly, greater understanding of parents reporting low stress at the time of admission would be useful, since their children's outcomes were not as favorable as those of parents who expressed reductions in parenting stress, and because lower parenting stress at admission may carry greater risk for rehospitalization of preadolescent inpatients (Blader, 2004). It is unclear if consistently low parenting stress is a marker of disengagement, less identification with the child's difficulties, or perhaps an accommodation to the chronic difficulties of children at higher risk for adverse outcomes regardless. Nevertheless, the identification of this group as more prone to disadvantageous outcomes may have policy implications for the allocation of scarce resources for intensive forms of postdischarge support.

Among the study's limitations, reliance on parental self-report for predictors and children's behavioral outcome imposes constraints on these variables as ingredients for a model of postdischarge outcomes. Global informant biases could, on a given occasion, harmonize responses in overall positive or negative directions. However, our test of whether general



parental distress could parsimoniously explain the reductions in both parenting stress and behavioral problems did not support this possibility.

Another limitation concerns the capacity for a questionnaire to yield ‘pure’ measures of the constructs under study. Incorporating objective or multi-informant assessments might insulate results somewhat from informant bias or contamination of the measures’ constructs. However, the ‘signal’ for association between self-reported parenting stress and parents’ behavioral ratings offers justification for research with more elaborate data-collection methods.

Generalization of these findings to patient groups other than the quite impaired youngsters that inpatients represent is uncertain. All the same, there is a pressing need to learn more about the determinants of the outcomes of hospitalized children. Appropriate community-based care to avert restrictive placements and to manage their conditions effectively is central to the quest in many countries to improve the long-term prognosis of a vulnerable patient group and to deploy resources in an optimal fashion.

## Abbreviations

PSI      Parenting Stress Index

## Acknowledgments

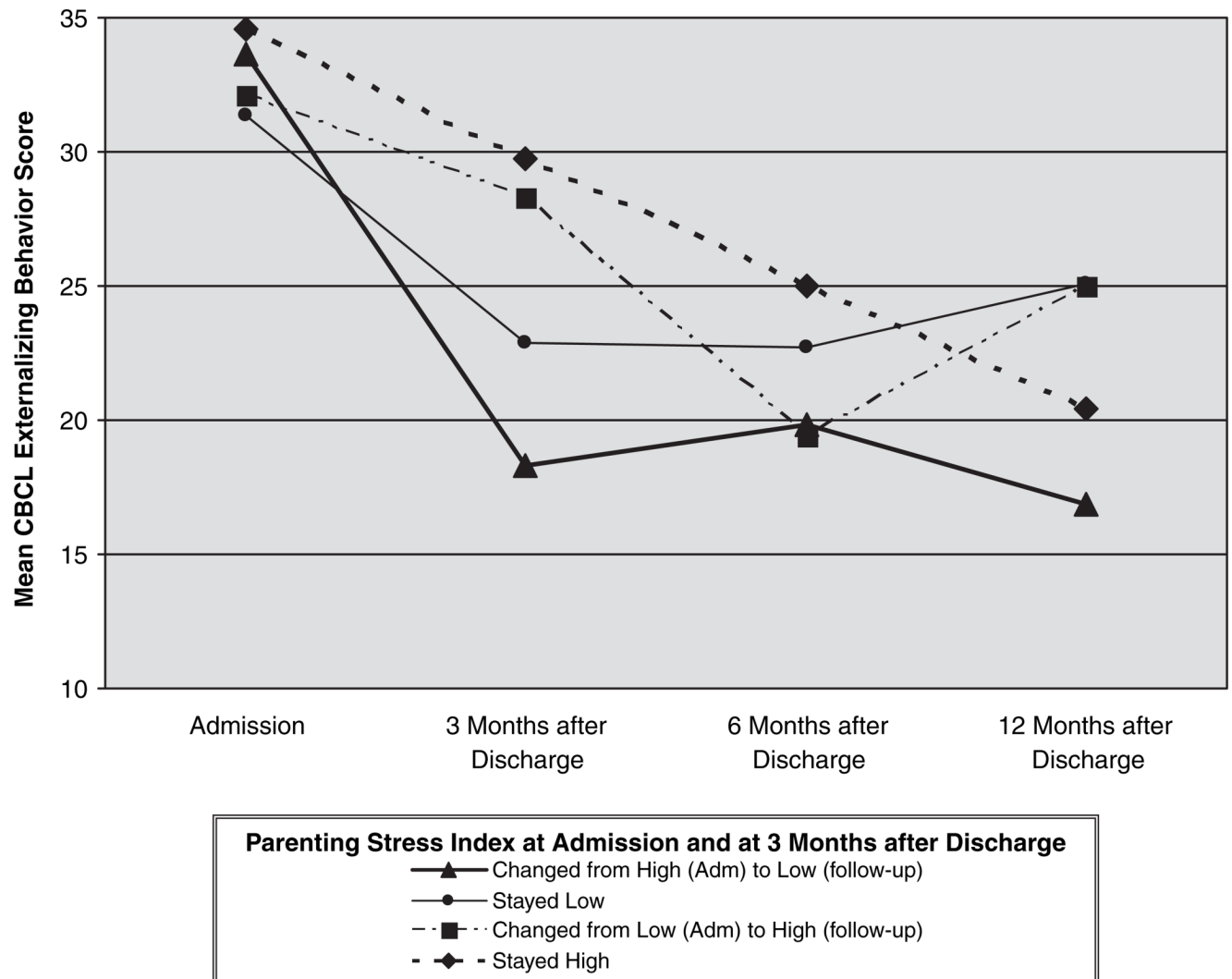
Supported in part by the National Institutes of Health, Bethesda, USA (grants MH058456 and MH064975). Ariella Levy assisted in data collection and Nina Schooler provided valuable comments on the development of this report.

## References

- Abidin, RR. Parenting Stress Index. 3rd edn. Odessa, FL: Psychological Assessment Resources; 1995.
- Achenbach, TM. Integrative guide for the 1991 CBCL/4–18, YSR and TRF profiles. Burlington, VT: University of Vermont Department of Psychiatry; 1991.
- Angold A, Costello EJ, Erkanli A. Comorbidity. *Journal of Child Psychology and Psychiatry* 1999;40:57–87. [PubMed: 10102726]
- Angold A, Messer SC, Stangl D, Farmer EMZ, Costello EJ, Burns BJ. Perceived parental burden and service use for child and adolescent psychiatric disorders. *American Journal of Public Health* 1998;88:75–80. [PubMed: 9584037]
- Baker BL, Heller TL, Henker B. Expressed emotion, parenting stress, and adjustment in mothers of young children with behavior problems. *Journal of Child Psychology and Psychiatry* 2000;41:907–915. [PubMed: 11079433]
- Barry TD, Dunlap ST, Cotten SJ, Lochman JE, Wells KC. The influence of maternal stress and distress on disruptive behavior problems in boys. *Journal of the American Academy of Child and Adolescent Psychiatry* 2005;44:265–273. [PubMed: 15725971]
- Beauchaine TP, Webster-Stratton C, Reid MJ. Mediators, moderators, and predictors of 1-year outcomes among children treated for early-onset conduct problems: A latent growth curve analysis. *Journal of Consulting and Clinical Psychology* 2005;73:371–388. [PubMed: 15982136]
- Blader JC. Symptom, family, and service predictors of children’s psychiatric rehospitalization within one year of discharge. *Journal of the American Academy of Child and Adolescent Psychiatry* 2004;43:440–451. [PubMed: 15187804]
- Brannan AM, Heflinger CA, Bickman L. The Caregiver Strain Questionnaire: Measuring the impact on the family of living with a child with serious emotional disturbance. *Journal of Emotional and Behavioral Disorders* 1997;5:212–222.
- Brestan EV, Eyberg SM. Effective psychosocial treatments of conduct-disordered children and adolescents: 29 years, 82 studies, and 5,272 kids. *Journal of Clinical Child Psychology* 1998;27:180–189. [PubMed: 9648035]

- Bryk, AS.; Raudenbush, SW. Hierarchical linear models: Applications and data analysis methods. Newbury Park, CA: Sage; 1992.
- Burke JD, Loeber R, Lahey BB, Rathouz PJ. Developmental transitions among affective and behavioral disorders in adolescent boys. *Journal of Child Psychology and Psychiatry* 2005;46:1200–1210. [PubMed: 16238667]
- Burt SA, McGue M, Krueger RF, Iacono WG. How are parent–child conflict and childhood externalizing symptoms related over time? Results from a genetically informative cross-lagged study. *Development and Psychopathology* 2005;17:145–165. [PubMed: 15971764]
- Butzlaff RL, Hooley JM. Expressed emotion and psychiatric relapse. *Archives of General Psychiatry* 1998;55:547–552. [PubMed: 9633674]
- Chen E, Bloomberg G, Fisher E, Strunk R. Predictors of repeat hospitalizations in children with asthma: The role of psychosocial and socioenvironmental factors. *Health Psychology* 2003;22:12–18. [PubMed: 12558197]
- Derogatis, LR. Symptom Checklist–90–R: Administration, scoring, and procedures manual. 3rd edn. Minneapolis: National Computer Systems; 1994.
- Eisenberg N, Fabes RA, Guthrie IK, Reiser M. Dispositional emotionality and regulation: Their role in predicting quality of social functioning. *Journal of Personality and Social Psychology* 2000;78:136–157. [PubMed: 10653511]
- Green J, Kroll L, Imrie D, Frances FM, Begum K, Harrison L, et al. Health gain and outcome predictors during inpatient and related day treatment in child and adolescent psychiatry. *Journal of the American Academy of Child and Adolescent Psychiatry* 2001;40:325–332. [PubMed: 11288774]
- Guterman EM. Is diagnosis relevant in the hospitalization of potentially dangerous children and adolescents? *Journal of the American Academy of Child and Adolescent Psychiatry* 1998;37:1030–1037. [PubMed: 9785714]
- Hedeker D, Flay BR, Petraitis J. Estimating individual influences of behavioral intentions: An application of random-effects modeling to the theory of reasoned action. *Journal of Consulting and Clinical Psychology* 1996;64:109–120. [PubMed: 8907090]
- Hinshaw SP, Owens EB, Wells KC, Kraemer HC, Abikoff HB, Arnold LE, et al. Family processes and treatment outcome in the MTA: Negative/ineffective parenting practices in relation to multimodal treatment. *Journal of Abnormal Child Psychology* 2000;28:555–568. [PubMed: 11104317]
- Hooley JM, Hoffman PD. Expressed emotion and clinical outcome in borderline personality disorder. *American Journal of Psychiatry* 1999;156:1557–1562. [PubMed: 10518166]
- Kazdin AE, Whitley MK. Treatment of parental stress to enhance therapeutic change among children referred for aggressive and antisocial behavior. *Journal of Consulting and Clinical Psychology* 2003;71:504–515. [PubMed: 12795574]
- Loeber R, Dishion TJ. Boys who fight at home and school: Family conditions influencing cross-setting consistency. *Journal of Consulting and Clinical Psychology* 1984;52:759–768. [PubMed: 6501661]
- Lundy MS, Pfohl BM, Kuperman S. Adult criminality among formerly hospitalized child psychiatric patients. *Journal of the American Academy of Child and Adolescent Psychiatry* 1993;32:568–576. [PubMed: 8496121]
- Lynam DR. Early identification of the fledgling psychopath: Locating the psychopathic child in the current nomenclature. *Journal of Abnormal Psychology* 1998;107:566–575. [PubMed: 9830244]
- MacLeod RJ, McNamee JE, Boyle MH, Offord DR, Friedrich M. Identification of childhood psychiatric disorder by informant: Comparisons of clinic and community samples. *Canadian Journal of Psychiatry* 1999;44:144–150.
- Moos, RH.; Moos, BS. Family Environment Scale manual. 3rd edn. Palo Alto, CA: Consulting Psychologists Press; 1994.
- Nicholson J, Young SD, Simon LJ, Fisher WH, Bateman A. Privatized Medicaid managed care in Massachusetts: Disposition in child and adolescent mental health emergencies. *Journal of Behavioral Health Services and Research* 1998;25:279–292. [PubMed: 9685747]
- Pottick KJ, McAlpine DD, Andelman RB. Changing patterns of psychiatric inpatient care for children and adolescents in general hospitals, 1988–1995. *American Journal of Psychiatry* 2000;157:1267–1273. [PubMed: 10910789]

- Ringel JS, Sturm R. National estimates of mental health utilization and expenditures for children in 1998. *Journal of Behavioral Health Services and Research* 2001;28:319–333. [PubMed: 11497026]
- Rogosa DR, Brandt D, Zimowski M. A growth curve approach to the measurement of change. *Psychological Bulletin* 1982;92:726–748.
- Scott S, Spender Q, Doolan M, Jacobs B, Aspland H. Multicentre controlled trial of parenting groups for childhood antisocial behaviour in clinical practice. *British Medical Journal* 2001;323:194–199. [PubMed: 11473908]
- Shelton KK, Frick PJ, Wootton J. Assessment of parenting practices in families of elementary school-age children. *Journal of Clinical Child Psychology* 1996;25:317–329.
- Sourander A, Piha J. Three-year follow-up of child psychiatric inpatient treatment. *European Child and Adolescent Psychiatry* 1998;7:153–162. [PubMed: 9826302]
- Stoolmiller M. Synergistic interaction of child manageability problems and parent-discipline tactics in predicting future growth in externalizing behavior for boys. *Developmental Psychology* 2001;37:814–825. [PubMed: 11699755]
- Thompson A, Hollis C, Dagger DR. Authoritarian parenting attitudes as a risk for conduct problems: Results from a British national cohort study. *European Child and Adolescent Psychiatry* 2003;12:84–91. [PubMed: 12664272]
- Treacy L, Tripp G, Baird A. Parent stress management training for attention-deficit/hyperactivity disorder. *Behavior Therapy* 2005;36:223–233.
- van Os J, Marcelis M, Germeys I, Graven S, Delespaul P. High expressed emotion: Marker for a caring family? *Comprehensive Psychiatry* 2001;42:504–507. [PubMed: 11704944]
- Vaughn C, Leff J. The measurement of expressed emotion in the families of psychiatric patients. *British Journal of Social and Clinical Psychology* 1976;15:157–165. [PubMed: 938822]



**Figure 1.** Mean CBCL-Externalizing behavior scores over assessment times, for groups differing by stability or change on Parenting Stress Index scores between admission and three-month follow-up

**Table 1**

CBC-Externalizing score and family-related predictors across assessments

	Assessment point, mean (sd)				Random regression for Time		
	Adm.	3 m FU	6 m FU	12 m FU	B	F	p
Child Behavior Checklist							
Externalizing problems	31.26 (11.59)	25.32 (12.51)	23.16 (13.22)	23.27 (12.67)	-6.15	33.46	.001
Alabama Parenting Quest.							
Parental involvement	35.31 (7.98)	36.45 (7.91)	37.08 (6.88)	37.94 (5.84)	1.51	7.44	.01
Low monitoring	15.15 (6.00)	15.08 (5.63)	14.21 (4.69)	14.31 (4.57)	-.60	2.12	.15
Inconsistent discipline	15.84 (4.16)	14.83 (4.34)	13.91 (3.78)	13.78 (4.39)	-1.34	13.36	.00
Corporal punishment	4.95 (2.04)	4.68 (1.95)	4.52 (1.68)	4.25 (1.49)	-.42	5.81	.02
Positive parenting skills	25.33 (3.92)	25.79 (3.23)	26.14 (3.31)	25.80 (3.42)	.10	.14	.71
Parenting Stress Index							
Short form total	103.39 (24.75)	99.69 (23.94)	93.19 (30.88)	92.35 (21.80)	-7.65	10.48	.001
Caregiver Strain Index							
Objective	28.58 (10.74)	25.94 (12.28)	24.75 (11.47)	22.17 (8.88)	-5.25	41.93	.001
Subjective: Internalized	24.32 (6.66)	21.46 (8.30)	19.67 (7.84)	19.35 (5.59)	-4.02	43.07	.001
Subjective: Externalized	6.31 (2.96)	5.73 (3.43)	5.16 (2.80)	5.45 (2.49)	-.78	9.59	.001
Family Environment Scale							
Cohesion	5.93 (2.44)	6.15 (2.69)	6.63 (2.40)	6.74 (2.37)	.65	10.83	.001
Control	5.33 (1.84)	5.55 (2.19)	5.91 (1.85)	5.44 (1.97)	.27	2.77	.10
Recent Events Scale							
Total stress rating	12.42 (13.19)	20.69 (61.15)	46.94 (82.64)	10.43 (26.45)	.65	10.83	.001
Symptom Checklist-90 (caregiver)							
Total score	63.01 (54.77)	57.24 (53.67)	53.96 (58.43)	50.19 (62.51)	-8.82	3.49	.065

**Table 2**

Family variables and prediction of CBC-Externalizing score

	Admission scores predicting outcome				Follow-up scores predicting outcome			
	<i>B</i> <sub>Intercept</sub>	<i>F</i>	<i>p</i>	<i>B</i> <sub>Slope</sub>	<i>F</i>	<i>p</i>	<i>B</i>	<i>F</i>
Alabama Parenting Questionnaire								
Parental involvement	-.17	2.57	.10	-.14	.95	.33	-.13	7.47
Low monitoring	-.33	5.82	.02	-.28	2.41	.12	-.06	.97
Inconsistent discipline	-.04	.04	.85	-.06	.05	.82	.20	4.75
Corporal punishment	.00	.00	.99	-.46	.84	.36	.49	9.01
Positive parenting skills	-.05	.05	.83	.09	.08	.78	-.15	1.94
Parenting Stress Index								
Short form total	-.05	1.68	.20	-.08	2.83	.10	.08	27.05
Caregiver Strain Index								
Objective	.03	.17	.68	-.03	.08	.78	.15	21.28
Subjective: Internalized.	.02	.03	.87	-.06	.14	.71	.18	11.24
Subjective: Externalized	-.04	.01	.90	-.17	.19	.67	.28	4.92
Family Environment Scale								
Cohesion	.17	.13	.72	.03	.00	.96	-.58	14.04
Control	.17	.13	.72	.03	.00	.96	.09	.23
Recent Events Scale								
Total event rating	-.05	.69	.41	-.06	.47	.50	.00	.05
Symptom Checklist -90 (caregiver)								
Total score	-.011	3.25	.07	-.01	1.04	.32	.04	4.90

*Note:* All analyses adjust for the main effects of admission CBC-Externalizing score, Time, and Time<sup>2</sup>.



**Table 3**

Multivariable predictor models for CBC-Externalizing score

	Predictor coefficients		
	Beta	F	p
I. Unconditional model			
Admission CBC-Externalizing score	.911	757.90	<.001
Time	-7.04	31.14	<.001
Time <sup>2</sup> (quadratic)	9.31	42.12	<.001
Model Fit: $\chi^2 = 400.63$ , $p < .001$ -2LL = 1921			
II. Include predictors at admission			
Admission CBC-Externalizing score	.99	5299.76	<.0001
Time	-8.53	49.02	<.0001
Time <sup>2</sup>	8.73	17.81	<.0001
Child not residing with parent	2.36	1.70	.20
Time $\times$ Child not residing with parent	4.10	2.12	.15
Admission parent involvement	.02	.05	.82
Time $\times$ Admission parent involvement	-.04	.08	.78
Admission low monitoring	.04	.14	.71
Time $\times$ Admission low monitoring	.07	.16	.69
Admission parenting stress	-.07	5.87	.02
Time $\times$ Admission parenting stress	-.11	5.61	.02
Admission parental symptom checklist - 90	.00	.01	.93
Time $\times$ Adm. symptom checklist - 90	-.01	.54	.47
Model Fit: $\chi^2 = 387.97$ , $p < .001$ -2LL = 1900.2 $\Delta$ -2LL = 20.8, $df = 2$ , $p < .001$			
III. Include predictor values at follow-up assessments			
Admission CBC-Externalizing score	.99	8641.3	<.0001
Time	8.14	19.85	<.0001
Time <sup>2</sup>	-8.24	71.24	<.0001
Admission parenting stress	-.31	74.51	<.0001
Time $\times$ Admission parenting stress	-.07	3.07	.09
Parental involvement at follow-up	.02	2.64	.11
Inconsistent discipline at follow-up	.01	.23	.63
Corporal punishment at follow-up	.00	.01	.93
Parenting stress at follow-up	.26	97.29	<.0001
Caregiver strain -total at follow-up	.00	.3	.59
Family cohesion at follow-up	-.03	.27	.61
Symptom checklist-90 at follow-up	.01	6.36	.02
Model Fit: $\chi^2 = 358.32$ , $p < .001$ -2LL = 1817 $\Delta$ -2LL = 83.2, $df = 2$ , $p < .001$			
IV. Include change in parenting stress			
Admission CBC-Externalizing score	.977	4538.08	<.0001
Time	-7.989	48.55	<.0001
Time <sup>2</sup>	9.303	27.19	<.0001

	Predictor coefficients		
	Beta	<i>F</i>	<i>p</i>
Admission parenting stress	-.124	11.97	.001
Time × Admission parenting stress	-.025	.27	.61
Symptom checklist-90 at follow-up	.003	8.75	.005
Parenting stress at follow-up	.117	27.65	<.0001
Change in parenting stress (Adm-3M)	-.037	23.00	<.0001
Model Fit: $\chi^2 = 276.99$ , $p < .001$ -2LL = 1523.5 $\Delta$ -2LL = 293.5, $df = 1$ , $p < .001$			

**Table 4**

Effects of change in externalizing behavior between admission and follow-up on postdischarge ratings of parenting stress

Variable	Beta	F	p
Admission parenting stress	.83	428.85	<.0001
Time	2.59	.04	.85
Admission externalizing behavior ratings	-.78	10.04	.003
Time × Admission externalizing behavior	-.14	.13	.72
Behavioral disorder at follow-up	.88	37.35	<.0001
Change in externalizing behavior ratings (Adm – 3M)	-.04	.27	.61