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Longitudinal Impact of Family Functioning on Children Served in Systems of Care

Eric R. Wright, Ph.D.

Indiana University-Purdue University Indianapolis<sup>1</sup>

Jeffrey A. Anderson, Ph.D.

Ken Kelley, Ph.D.

Indiana University Bloomington<sup>2</sup>

Harold Kooreman

Indiana University-Purdue University Indianapolis<sup>1</sup>

<sup>1</sup> Eric R. Wright, Harold Kooreman; Indiana University, School of Public and Environmental Affairs, Indianapolis

<sup>2</sup> Jeffrey A. Anderson, Ken Kelley; Indiana University, School of Education, Bloomington

Correspondence concerning this article should be addressed to: Eric R. Wright, Ph.D., Professor and Director, Center for Health Policy, Indiana University-Purdue University Indianapolis, 801 W. Michigan Street, BS 4059, Indianapolis, IN 46204; email: ewright@iupui.edu. This study was supported in part by a grant from Macro International, Inc. (Subcontract No. 35126-6S-726) with financial support from the Center for Mental Health Services.

## Abstract

A central philosophical principle of Systems of Care (SOC) is that the family should be included in the treatment of children and youth with serious emotional disorders (SED). Numerous studies have examined how various aspects of family structure and functioning are correlated with the children's mental health status; however, few have considered how changes in the family context impact the mental health of children and youth with SED. Using data from the Macro International's national evaluation of the Center for Mental Health Services' Comprehensive Community Mental Health Services for Children and Their Families Program, we use multilevel modeling techniques to examine the relationship between patterns of change at the family level and patterns of clinical change at the child level. The results indicate that improvements in family resources and functioning have a positive impact on children's clinical course, while increases in caregiver strain can significantly reduce any positive gains children make over the course of treatment. The implications of these patterns for the organization of SOC are discussed.

## Keywords

Systems of care

Children's clinical functioning

Family functioning

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Implemented because of widespread recognition that traditional methods of service provision were failing to improve outcomes for youth with emotional and behavioral challenges and their families (Bruns & Burchard, 1998; Lyons, 2004), “systems of care” (SOC) are quickly becoming the preferred method of providing community-based services to youth with serious emotional disturbance (SED) and their families (Beth A. Stroul & Friedman, 1986; U. S. Department of Health & Human Services, 1999). Indeed, federally funded SOCs have been implemented and are being evaluated in almost 100 communities around the nation. The national evaluation of the Comprehensive Community Mental Health Services for Children and Their Families Program provides a great deal of information about the implementation of systems of care, the youth and their families being served, service usage, changes in functioning over time, caregiver strain, family resources, and family functioning. While these initiatives have resulted in significant clinical improvements for many youth, surprisingly little is known about the specific processes associated with improved outcomes in both youth and their families (Walker & Schutte, 2004; Wright, Wright, Kooreman, & Anderson, 2005).

This paper presents a secondary analysis of data collected by Macro International and the Center for Mental Health Services from the national evaluation. The central objective is to describe patterns in family functioning, resources, structure, and strain over time and how those patterns impact outcomes among youth with SED over time. Existing studies have described the experience and impact of mental illness on families and caregivers (Biegel, Song, & Milligan, 1995; Cook, Hoffschmidt, Cohler, & Pickett, 1992; Cook & Pickett, 1988; Lefley, 1996) and the impact of family structure, family functioning, caregiver strain, and other external factors on

childhood delinquency (Ary, Duncan, Duncan, & Hops, 1999; Brook, Brook, Gordon, & Whiteman, 1990; Cole & Zahn-Waxler, 1992; Dilworth-Anderson, 1989; Dumas, 1986; Faraone, Biederman, Keenan, & Tsuang, 1991; Frick et al., 1992; Hawkins & Catalano, 1992; Katz & Gottman, 1993; Kumpfer & DeMarsh, 1986; Loeber, 1990; Offord, 1982; Robins, 1981; Zill, 1993). However, the link between changes in family functioning and outcomes for children with SED receiving treatment in a SOC has yet to be examined. In this study, we attempt to fill this gap using data from the national evaluation of the CMHC demonstration program.

### Background

Despite the assumed effectiveness of the SOC model, little empirical research exists which focuses on its effectiveness for the youth and families served. A review of preliminary, uncontrolled outcome studies of service coordination programs indicates that young persons with SED appear to benefit from receiving a coordinated mix of services. Young people with SED have been rated by caregivers or service providers as showing improvement in home and school functioning (Clark, Schaefer, Burchard, & Welkowitz, 1992; Eber, Osuch, & Redditt, 1996; Hyde, Burchard, & Woodworth, 1996; Joyner, 1992; Robbins & Collins, 2002) and behavior (Anderson, Wright, Kooreman, Mohr, & Russell, 2003; Bruns, Burchard, & Yoe, 1995; Evans, Armstrong, & Kuppinger, 1996; Huz, McNulty, & Evans, 2000; Phan & Bell, 2002; Yoe, Santarcangelo, Atkins, & Burchard, 1996), and have also been maintained in less restrictive community-based settings (Anderson, Wright, Kooreman, Mohr, & Russell, 2003; Eber, Osuch, & Redditt, 1996; Evans, Armstrong, & Kuppinger, 1996; Glisson, 1994; Hurley, Goldsmith, & Lord, 2003; Hyde, Burchard, & Woodworth, 1996; Yoe, Santarcangelo, Atkins, & Burchard, 1996). Studies which have incorporated control groups show mixed results with some reporting no differences in improvement between young people receiving and not receiving service

coordination (Bickman, 1996; Bickman, Smith, Lambert, & Andrade, 2003; Carney & Buttell, 2003; Connor, Phan, & Stephens, 2002; Morgan, Cauce, Wagner, & Moore, 2000; Stephens, Phan, & Greenbaum, 2003) while others report more improvement for young people receiving services in programs which follow system-of-care principles (Foster, Qaseem, & Connor, 2004; Holden et al., 2002; Stephens, Holden, & Hernandez, 2004).

Much of the focus in SOC research is on outcomes for the children who receive services. A key component, however, of the SOC philosophy is that the focus of treatment is not just the child with SED but also the child's family (McCammon, Spencer, & Friesen, 2001; Stern, 2004; Beth A. Stroul & Friedman, 1986; B.A. Stroul & Friedman, 1988a, , 1988b). Families of youth with SED often face significant challenges. Considerable research exists to show that families who are caring for children with a SED experience a great deal of strain due to their caretaking role (Angold et al., 1998; A. M. Brannan & Heflinger, 1997; A. M. a. Brannan & Heflinger, 2006; Donner et al., 1995; Friesen & Huff, 1996; Heflinger & Taylor-Richardson, 2004; Kang, Brannan, & Heflinger, 2005; Taylor-Richardson, Heflinger, & Brown, 2006; Thompson & Doll, 1982). Caregivers often report objective, observable types of strain resulting from their child's problem behavior such as missing work, neglecting other family members, financial problems as well as more internal, subjective types of strain such as feeling sad and unhappy or feeling resentment, anger or embarrassment about their child (A. M. Brannan & Heflinger, 1997). Research on caregiver strain for parents and family members of young people with SED has focused on three main areas: predictors of strain, the relationship between caregiver strain and service use, and the relationship of caregiver strain to youth outcomes. In regards to predictors of strain, studies have consistently reported that the best predictor of strain is the severity of the

youth's problem behavior (Angold et al., 1998; B. L. Baker et al., 2003; A. M. a. Brannan & Heflinger, 2001; Bussing et al., 2003; Early, Gregoire, & P., 2002; Heflinger & Taylor-Richardson, 2004; Lecavalier, Leone, & Wiltz, 2006; McDonald & Gregoire, 1997; Yatchmenoff, Koren, Friessen, Gordon, & Kinney, 1998). Other factors found to predict caregiver strain are involvement of the youth with the juvenile justice system (Cauffman, Scholle, Mulvey, & Kelleher, 2005), the relationship of the caregiver to the youth (Heflinger & Taylor-Richardson, 2004; Taylor-Richardson, Heflinger, & Brown, 2006), the caregiver's race (Kang, Brannan, & Heflinger, 2005), the caregiver's socioeconomic status and level of resources (A. M. Brannan, Manteuffel, Holden, & Heflinger, 2006; McDonald & Gregoire, 1997), the caregiver's ability to access services (A. M. a. Brannan & Heflinger, 2006), a low sense of family empowerment and poor service coordination from treatment providers (Yatchmenoff, Koren, Friessen, Gordon, & Kinney, 1998), poor family functioning (A. M. a. Brannan & Heflinger, 2006), and inadequate social, community, and spiritual support (Bussing et al., 2003; Lange et al., 2005; McDonald & Gregoire, 1997; Yatchmenoff, Koren, Friessen, Gordon, & Kinney, 1998). When predicting service use, the level of caregiver strain has been found to predict the likelihood of service use (Angold et al., 1998; Farmer & Burns, 1997; Garland et al., 2005), to predict the combination of services used (A. M. Brannan, Heflinger, & Foster, 2003; Lambert, Brannan, Breda, Heflinger, & Bickman, 1998) to predict the length of stay in inpatient treatment centers (Foster, 2000) and to predict the cost of care, gaps in care, and level of care over time (A. M. Brannan, Heflinger, & Foster, 2003). In terms of predicting change in the behavioral problems of SED youth, higher levels of caregiver strain at enrollment into a SOC have been associated with improved outcomes after 6 months (Walrath, Ybarra, & Holden, 2006). Similarly, higher levels of caregiver stress reported by parents of young people being

admitted to psychiatric hospitals was positively related to better post-discharge outcomes than was lower levels of stress (Blader, 2006). Finally, Early, Gregoire, and McDonald (2002) examined the relationship between youth behavior problems and parental stress over time and found that high caregiver strain predicting higher levels of behavior problems and vice versa.

There is also evidence that the behavior of children and adolescents is linked to family functioning. A number of family-based risk factors have been identified as correlates of delinquent behavior in youth including: a family history of the behavior problem or of mental illness (Derisley, Libby, Clar, & Reynolds, 2005; Faraone, Biederman, Keenan, & Tsuang, 1991; Frick et al., 1992; Gabel et al., 1998; Gove & Crutchfield, 1982; Hawkins & Catalano, 1992; Lange et al., 2005; Leinonen, Solantaus, & Punamaki, 2003; Nelson, Stage, Duppong-Hurley, Synhorst, & Epstein, 2007; Offord, 1982; Pressman et al., 2006; Robins, 1981); living in a one-parent or “broken” home (Canter, 1982; Gove & Crutchfield, 1982); neglecting to teach life, social, and academic skills to the child or monitor the child's activities (Ary, Duncan, Duncan, & Hops, 1999); the use of physical punishment (Gove & Crutchfield, 1982); repeated loss of caretakers (Loeber, 1990); negativity and rejection of the child by the parents (Brook, Brook, Gordon, & Whiteman, 1990; Cole & Zahn-Waxler, 1992); lack of involvement and time together (Kumpfer & DeMarsh, 1986); excessive family conflict, marital discord, and family disorganization (Gove & Crutchfield, 1982; Katz & Gottman, 1993); family relationships characterized by high levels of disengagement and either an extremely rigid or extremely chaotic reaction to stress (Blaske, Borduin, & Henggeler, 1989; Canter, 1982; Elgar, Knight, Worrall, & Sherman, 2003; Gabel et al., 1998; Henggeler, Burr-Harris, Borduin, & McCallum, 1991; Matherne & Thomas, 2001; Prange et al., 1992; Tolan, 1988); a lack of extended family

networks and community resources (Dilworth-Anderson, 1989; Dumas, 1986). Family functioning in general may also be influenced by external demographic variables such as poverty, neighborhood organization and housing, reduced access to educational, cultural, and job opportunities, and experiences with discrimination (Zill, 1993).

The controversial literature on expressed negative emotion (EE) in families of persons with mental illness indicates a relationship between EE and relapse among persons with schizophrenia (Leff & Vaughn, 1985; Parker & Hadzi-Pavlovich, 1990). Similarly EE has been used as a risk factor for childhood depression, antisocial behavior, and other types of childhood psychopathology (Asarnow, Tompson, Hamilton, Goldstein, & Guthrie, 1994; Asarnow, Tompson, Woo, & Cantwell, 2001; Bruce L. Baker, Heller, & Henker, 2000; Caspi et al., 2004; McCarty & Weisz, 2002). However, there is still considerable conflict as to the directionality of these effects and the extent to which EE plays a causal role in either the development or relapse of psychiatric problems among the many other possible factors.

Finally, the adequacy of a family's resources (e.g., food, clothing, shelter, access to medical care, time to be with friends, money for vacations, etc) may impact the care a young person receives. Research has indicated that youth of caregivers who report fewer or inadequate resources are at a higher risk of being readmitted to inpatient psychiatric hospitals (Foster, 1999) and more likely to experience a break in care of 30 days or longer (A. M. Brannan, Heflinger, & Foster, 2003). Additionally, the level of a family's resources has been thought to affect caregiver wellbeing, parenting, and how families interact with service systems (Dunst, Leet, & Trivette, 1988; McGrew, Gilman, & Johnson, 1992; Modrcin & Robison, 1991). The focus placed on

families within SOC's would seem to indicate that to properly understand outcomes for youth; research needs to examine changes in the level of resources available to families.

To date, the extent to which caregiver strain, family functioning, and family resources improve over time among families of children in a SOC remains unclear. Likewise, the link between changes in family functioning and outcomes for children with SED receiving treatment in a SOC has yet to be examined. This study will provide valuable insight into improvements in the role of family-based factors on the success of youth in systems of care.

## Methods

### *Data Source*

Data for this study were compiled by Macro International from interviews with the caregivers of students enrolled in a large-scale national evaluation of the Comprehensive Community Mental Health Services for Children and Their Families Program (CMHS, 2001; Holden et al., 2001). Caregiver interviews for the evaluation are conducted at enrollment and at 6-month intervals, up to and beyond 24 months. Typically, respondents are parents, biological or foster, but interviewees also can include other kin, as well as adult providers from other settings (e.g., a child care worker in a residential setting). Specifically, in addition to description information about the youth in this sample, data for this study were generated from two well-known clinical measures of children's functioning and three family functioning instruments.

### *Dependent Measures*

*Child Behavior Checklist (CBCL).* The CBCL (Achenbach, 1991) is a caregiver rated report used primarily to assess behavior and emotional problems among children and adolescents ages 4 to 18. Behavior and emotional problems are assessed using 113 items that ask a child's caregiver to rate whether the problem is not true of their child, somewhat true or sometimes true of their child, or very or often true of their child. The 113 items yield a total problem score, two

broadband syndrome scales (i.e., internalizing problems and externalizing problems), and eight narrow-band syndrome scores associated with more specific categories of emotional and behavior problems (e.g., withdrawal, aggressiveness). Scores on all scales can range from 50 to 100. Total problems scores with a T value of 60-63 are considered borderline clinical; above 63 are considered to be in the clinical range; while similar T scores on the Internalizing and Externalizing scales indicate clinically significant challenges in that area. Researchers have reported adequate reliability and construct validity for the CBCL (Achenbach, 1991; Barkley, 1988; McConaughy, 1993).

*Behavioral and Emotional Rating Scale (BERS).* The BERS (Epstein, 1999; Epstein, Harniss, Pearson, & Ryser, 1999; Epstein, Ryser, & Pearson, 2002) assesses the emotional and behavioral strengths of young people. Caregivers are asked to determine whether the 52 items on the BERS are ‘very much like their child’, ‘like their child’, ‘not much like their child’, or ‘not at all like their child’. The BERS provides an overall strength score as well as scores for interpersonal strengths, intrapersonal strengths, family involvement, school functioning, and affective strengths. Higher scores indicate greater strengths. The overall strength score can range from less than 70 to over 130. Scores below 70 indicate very poor strengths; scores from 70 to 79 indicate poor strengths; scores from 80 to 89 indicate below average strengths; scores from 90 to 110 indicate average strengths; scores from 111 to 120 indicate above average strengths; scores from 121 to 130 indicate superior strengths; and scores above 130 indicate very superior strengths. Appropriate levels of reliability and convergent validity have been found with the BERS (Epstein, Cullinan, Harniss, & Ryser, 1999; Epstein & Sharma, 1998; Harniss, Epstein, Ryser, & Pearson, 1999).

### *Independent Measures*

*Family Resource Scale (FRS).* The FRS is a 30-item scale designed to assess the adequacy of a family’s basic, financial, recreational, social, health, and other resources.

Caregivers respond to each item using a scale ranging from 1 (not at all adequate) to 5 (almost always adequate). The FRS yields six subscale scores and one overall resource score. For this analysis, only the overall resource score was used. Higher overall resource scores indicate higher levels of overall resources.

*Family Assessment Devise (FAD)*. The FAD general scale is a set of 11 questions designed to measure interaction patterns in families that are both healthy and unhealthy. Some of the items included were: (healthy interactions) Individuals are accepted for what they are; we are able to make decisions about how to solve problems; we can express feelings to each other; (unhealthy) planning family activities is difficult because we misunderstand each other; we avoid discussing our fears and concerns; we don't get along well together. Caregivers respond to the statements using a rating scale of strongly disagree to strongly agree. The scores are totaled and the average is taken. Average FAD general scale scores can range from 1 to 4. In the original scoring format, lower scores are associated with more positive family functioning, while higher scores are associated with poorer functioning (Epstein, Baldwin & Bishop, 1983). For ease of interpretation, the scored data provided by the national evaluators, Macro International, is recoded so that low scores indicate poorer family functioning and higher scores better family functioning.

*Caregiver Strain Questionnaire (CGSQ)*. The CGSQ is a 21-item scale that assesses the impact on caregivers of caring for a child with emotional and behavioral problems. Caregivers respond to each item using a response set that ranges from not at all to very much a problem. Though the CGSQ yields four strain scores, only the Global Strain score is analyzed as it has been found to be the most reliable and valid measure of strain. Higher scores on the Global Strain score indicate higher levels of caregiver strain.

*Demographics and referral source.* In terms of the demographic variables for this study, sex was coded as male/female, with male as the reference group. Race was coded as Caucasian/non-Caucasian, with Caucasian as the reference group. Age was a child's age at the time s/he enrolled in the system of care. Referral source indicated the system from which the youth had been referred to the system of care: court or corrections; education; physical health care agency; child welfare; self or caregiver; and other. Mental health agency served as the reference group.

### *Analytic Strategies*

For each dependent measure (CBCL and BERS), a separate longitudinal model was fit in which the dependent variable was modeled with a straight-line change model. The intercept and the slope of the straight-line change model were modeled as random effects, in which both a population intercept and slope were estimated (i.e., a fixed effect) in addition to allowing individual deviations from those parameter estimates (i.e., unique effects). The variability of the intercept and slope quantify the degree of interindividual differences in change coefficients. The values of the 5 time points were represented as 0 - 4 by 1. Thus, the intercept represents the relationship at baseline. Next, in an effort to explain interindividual differences in change of the intercept and slope, time invariant predictors were added as explanatory variables (sex, race, age at enrollment, & referral source).

Although the straight-line change model yields interesting and informative results in and of itself, our focal substantive interest in this paper is on the effect of the time varying family functioning predictors (FRS, FAD, CGSQ), all of which were centered for interpretational ease and to minimize multicollinearity for the interaction effects that were assessed, which will be discussed momentarily. Thus, a value of zero for any one of the Level 1 (time varying) predictors

represents the mean value of the particular variable. Models in which each of these Level 1 predictors had random effects as well as fixed effects were fitted. The models with fixed effects were deemed most appropriate due to the tendency for the models not to converge when all variables were modeled with random effects due to the increased complexity of the model because of the additional parameters estimated. All longitudinal models were fitted using the linear and nonlinear mixed effects models (nlme) package (Pinheiro & Bates, 2000; Pinheiro, Bates, DebRoy, & Sarkar, 2007; R Development and Core Team, 2007) in R (R Development and Core Team, 2007).

## Results

*Sample Characteristics.* Table 1 provides a demographic description of the young people used in this sample. A total of 8,518 youth had sufficient data to be included in the overall outcomes analyses. Racially, most of the young people in the sample were Caucasian (47.5%). The remainder of the sample was composed of youth from non-Caucasian racial groups (41.0%) and of youth whose racial background was not reported (11.5%). In terms of gender, most of the young people in the analyses were male (65.8%) with young women and youth whose gender was not reported making up the remaining 34.2% of the analysis sample. The mental health system (33.8%), school system (16.4%) and juvenile justice system (13.2%) were the most common referral sources for the young people in the sample. The typical young person in the sample was 12.0 years ( $SD = 3.6$ ) of age at the time he or she was enrolled for services.

Table 2 provides a demographic description of the families and caregivers used in the sample. Sufficient data for inclusion in the overall outcomes analyses was available for 8,315 caregivers and families. At the time of enrollment for services, caregivers reported that most of the youth in the analyses were in the sole custody of their biological mother (44.4%). On

average, the caregivers in the sample were just over 40 years of age ( $M = 40.5$ ,  $SD = 9.9$ ) at the time of enrollment into services. Educationally, 23.0% of caregivers in the analyses had not completed high school, 32.5% of caregivers indicated having earned a high school diploma or GED, and 37.2% of caregivers said they had completed some coursework above the high school level. Most of the caregivers in the sample (52.1%) reported an annual family income of less than \$20,000.00. Caregivers related that a large percentage of the young people in the sample had family histories of domestic violence (48.1%), mental illness (53.9%), criminal behavior (44.6%), and substance abuse (61.9%). At the time of their enrollment into services, caregivers reported that they had on average moderate global strain scores on the CGSQ ( $M = 2.9$ ,  $SD = 0.9$ ); somewhat adequate family resources as measured by the FRS ( $M = 3.6$ ,  $SD = 0.7$ ); and generally positive family functioning scores on the FAD ( $M = 2.9$ ;  $SD = 0.5$ ).

*CBCL.* The unconditional means model (see Table 3) shows the overall grand mean of CBCL scores to be 67.22 ( $p < .001$ ). An examination of the unconditional growth model for the CBCL shows that the initial status of the sample is 69.41 ( $p < .001$ ) and the slope is -1.93. ( $p > .001$ ). The Pseudo R-squared ( $R^2$ ) indicates the proportion of error variance from the reduced model (here the unconditional means model) that has been accounted for in the richer model (here the straight-line change model; note that reduced model must be nested within the second model). In this case, the linear effect of time reduced the error variance by .26%.

Next, we added the predictor variables of interest (see the Interactions (no random) model in Table 3) to the growth model. This model was determined to be the best fitting model of the contending models because it had the smallest AIC. In this “final” model, initial status is 73.81 ( $p < .001$ ). In this “final” model, the slope, -.92, was statistically significant ( $p < .001$ ) as before. Each of the time varying family functioning variables were significant ( $p < .001$ ) and each of the

interactions among the family functioning variables also were significant: FRS x FAD ( $p < .01$ ); FRS x CGSQ ( $p < .001$ ); FAD x CGSQ ( $p < .001$ ); and FRS x FAD x CGSQ ( $p < .01$ ). In terms of referral source, compared to mental health agency referrals, referrals coming from court/corrections ( $p < .001$ ), other ( $p < .001$ ), and self/caregiver ( $p < .01$ ) were each significantly lower. Age, gender, and race also are significant ( $p < .001$ ); however, the interaction of race and gender is not. The next Pseudo R-squared ( $R^2$ ) was calculated to derive the proportion of variance from the unconditional growth model that is accounted for by this final conditional model is .43, suggesting that this set of predictors accounts for 43% more of the variance than does a means only model (the proportion of variance accounted for above and beyond the straight-line change model was 16.3%).

*BERS.* The unconditional means model (see Table 4) shows the overall grand mean of BERS scores to be 42.04 ( $p < .001$ ). The unconditional growth model for the BERS shows that the initial status of the sample is 40.94 ( $p < .001$ ) and the slope is .93. ( $p < .001$ ). The Pseudo R-squared ( $R^2$ ) indicated that the proportion of variance from the unconditional means model explained by adding time in the unconditional growth model was .13; thus, approximately 13% of the within person variation in the BERS is associated with linear change over time. We then added the predictor variables of interest (see the Interactions model in Table 4) to the growth model. This model was determined to be the best fitting model of the contending models because it had the smallest AIC. In this “final” model, initial status is 43.86 ( $p < .001$ ). In this “final” model, the slope, -.15, was not statistically significant, indicating that it was not the passage of time itself that lead to a change but rather other things that lead to improvements in the BERS.

Each of the time varying family functioning variables were significant ( $p > .001$ ) and each of the interactions among the family functioning variables also were significant: FRSxFAD

( $p < .001$ ); FRSxCGSQ ( $p < .001$ ); FADxCGSQ ( $p < .001$ ); and FRS x FAD x CGSQ ( $p < .05$ ). In terms of referral source, compared to mental health agency referrals, only referrals coming from child welfare were significantly lower ( $p < .001$ ). Gender and race also were significant ( $p < .001$ ), as was the interaction of race and gender ( $p < .05$ ). Age was not a significant predictor. The Pseudo R-squared ( $R^2$ ) indicated that the proportion of variance from the unconditional growth model that is accounted for by this final conditional model was .32, suggesting that this set of predictors accounted for 32% more of the variance than the means only model (the proportion of variance accounted for above and beyond the straight-line change model was 18.4%).

## Discussion

Our results suggest that, in general, children across these SOC programs improved over time, as evidenced both by reductions in their overall symptoms (CBCL) and by improvement in their behavioral and emotional strengths (BERS). At the same time, our analysis also reveals an important connection between patterns of clinical change at the child level and at the family level. In particular, our findings suggest that improvements in family resources and in family functioning can enhance the improvements observed over time at the child level, both in terms of reducing symptoms and increasing strengths. At the same time, we find that higher levels of caregiver strain can have a deleterious effect on child outcomes, negating many of the overall improvements observed in symptoms and the development of psychosocial strengths. The importance of family-related characteristics on patterns of change among children in SOCs is further reinforced by the consistently significant interaction effects. These suggest that our three measures of family context – family resources (FRS), functioning (FAD), caregiver strain (CGSQ) – together modify their individual effects somewhat. Most notable, however, caregiver

strain appears to counter the generally more positive effects of improvements in family resources and functioning on the child outcomes.

The special importance of caregiver strain in shaping the family context for children with SED has important implications for the field. As noted above, extensive research has documented the considerable caregiving-related stress that families who have children with SED experience on a daily basis (Angold et al., 1998; A. M. Brannan & Heflinger, 1997; A. M. a. Brannan & Heflinger, 2006; Donner et al., 1995; Friesen & Huff, 1996; Heflinger & Taylor-Richardson, 2004; Kang, Brannan, & Heflinger, 2005; Taylor-Richardson, Heflinger, & Brown, 2006; Thompson & Doll, 1982), ranging from objective problems such as having to miss work, neglecting other family members, and financial problems as well as more subjective types of strain including sadness, resentment, anger, or embarrassment about their child (A. M. Brannan & Heflinger, 1997). Through this literature, there has been an assumption that changes in a child's mental health status will result in lower levels of caregiver strain, and our results would appear to support this general view. From this perspective, (Aneshensel, Pearlin, Mullan, Zarit, & Whitlatch, 1995) concept of stress proliferation emphasizes the public health importance of caring for caregiver's in order to reduce the negative impact of an individual's mental illness on their social network. Our findings indicate that this process may be more dynamic and involve both reciprocal effects for the child and caregiver as well as a reduction in the proliferation of caregiver strain. That is, as caregiver strain is reduced, the overall family context is strengthened, which in turn provides more support for positive clinical changes in the child with SED. The close and dynamic relationship between family and child change highlighted in our results underlines the critical importance of considering both the challenges and potential solutions for children with SED in the context of their family systems.

At the same time, our results indicate the need to expand our view of the family context. Clinicians have long observed that families of youth with SED often face significant challenges because of caregiver strain (Angold et al., 1998; A. M. Brannan & Heflinger, 1997; A. M. a. Brannan & Heflinger, 2006; Donner et al., 1995; Friesen & Huff, 1996; Heflinger & Taylor-Richardson, 2004; Kang, Brannan, & Heflinger, 2005; Taylor-Richardson, Heflinger, & Brown, 2006; Thompson & Doll, 1982); however, they also have noted that having a child with special needs also can impose special challenges on family resources and functioning (Asarnow, Tompson, Hamilton, Goldstein, & Guthrie, 1994; Asarnow, Tompson, Woo, & Cantwell, 2001; Bruce L. Baker, Heller, & Henker, 2000; Caspi et al., 2004; McCarty & Weisz, 2002). Yet, empirical studies of the various dimensions of family functioning on children's symptoms and strengths have tended to focus on the effect of a single aspect of a child's family. In this regard, our finding that multiple dimensions have competing influences on patterns of clinical change among children with SED offers a new perspective and underlines the need for future research to conceptualize and measure family context in a multidimensional way.

While the inclusion of family members in the treatment process is argued by many to be a critical element in achieving positive outcomes within SOC (McCammon, Spencer, & Friesen, 2001; Stern, 2004; Beth A. Stroul & Friedman, 1986; B.A. Stroul & Friedman, 1988a, , 1988b), there is enormous variability in SOC across the country in the extent and commitment that service coordinators and program managers involve families. Unfortunately, the data available through the national evaluation provide very little information on the types of services provided to the families or in the nature and extent of family involvement in the clinical treatment process. Our findings of the significance of family change on patterns of child change emphasize the potential value of a family-focus in the organization of both SOC and children's mental health

services more generally. While the Center for Mental Health Services' Comprehensive Community Mental Health Services for Children and Their Families Program has made this easier within many SOC, there remain significant policy barriers to providing this type of care. Mental health services typically are provided and reimbursed based on a single individual-level model of care, usually with separate systems for children and for adults, each with different rules and requirements. In part because of the expansion of the State Children's Health Program (SCHIP) and the CMHC initiative, access to care for children with SED has improved somewhat in recent years. Access for parents and other adult caregivers, however, has lagged primarily because of the organization of financing and delivery systems. To access treatment, these adults often must be admitted for care within the adult system where there is little support, through various reimbursement mechanisms, to coordinate the parent's care with that being provided by the child. SOC have begun to break down some of these silos, but often there are only limited funds available to pay for treatment for adults without referring them out for care within the adult system. We believe our results underline the potential promise of not only coordinating the care for the children but also the coordination of services for the entire family within SOC.

### Conclusion

Our aim in this paper was to examine the impact changes in the family context have on patterns of clinical change for children with SED enrolled in SOC programs across the country. The results suggest that family context does have an impact on patterns of change among children. In particular, we found that improvements in family resources and family functioning are associated with positive changes both in terms of symptom reduction and the development of their psychosocial strengths. At the same time, we found that caregiver strain has a negative effect on children, even when accounting for the positive impact of improvements in family

resources and functioning. Overall, the findings highlight the highly interrelated nature of different dimensions of family life on children's mental health and underscore the need to consider the multiple dimensions that shape the family's influence. Most important, our results affirm the SOC philosophy on the critical importance of involving families in the treatment process, as the mental and wellbeing of the family is deeply intertwined with the mental health of children and youth with SED.

## References

- Achenbach, T. M. (1991). *Manual for the Child Behavior Checklist/4-18 and 1991 Profile*. Burlington, VT: University of Vermont Department of Psychiatry.
- Anderson, J. A., Wright, E. R., Kooreman, H. E., Mohr, W. K., & Russell, L. A. (2003). The Dawn project: A model for responding to the needs of children with emotional and behavioral challenges and their families. *Community Mental Health Journal, 39*, 63-74.
- Aneshensel, C. S., Pearlin, L. I., Mullan, J. T., Zarit, S. H., & Whitlatch, C. J. (1995). *Profiles in caregiving: The unexpected career*. San Diego, CA: Academic Press.
- Angold, A., Messer, S. C., Stangl, D., Farmer, E. M. Z., Costello, E. J., & Burns, B. (1998). Perceived parental burden and service use for child and adolescent psychiatric disorders. *American Journal of Public Health, 88*(1), 75-80.
- Ary, D. V., Duncan, T. E., Duncan, S. C., & Hops, H. (1999). Adolescent problem behavior: The influence of parents and peers. *Behaviour Research & Therapy, 37*(3), 217-230.
- Asarnow, J. R., Tompson, M., Hamilton, E. B., Goldstein, M. G., & Guthrie, D. (1994). Family-expressed emotion, childhood-onset depression, and childhood-onset schizophrenia spectrum disorders: Is expressed emotion a nonspecific correlate of child psychopathology or a specific risk factor for depression? *Journal of Abnormal Child Psychology, 22*(2), 129-146.
- Asarnow, J. R., Tompson, M., Woo, S., & Cantwell, D. P. (2001). Is expressed emotion a specific risk factor for depression or a nonspecific correlate of psychopathology. *Journal of Abnormal Child Psychology, 29*(6), 573-583.
- Baker, B. L., Heller, T. L., & Henker, B. (2000). Expressed emotion, parenting stress, and adjustment in mothers of young children with behavior problems. *Journal of Child Psychology and Psychiatry, 41*(7), 907-915.
- Baker, B. L., McIntyre, L. L., Blacher, J., Crnic, K., Edelbrock, C., & Low, C. (2003). Pre-school children with and without developmental delay: behaviour problems and parenting stress over time. *Journal of Intellectual Disability Research, 47*(4/5), 217-230.
- Bickman, L. (1996). The evaluation of a children's mental health managed care demonstration. *Journal of Mental Health Administration, 23*(1), 7-15.
- Bickman, L., Smith, C. M., Lambert, E. W., & Andrade, A. R. (2003). Evaluation of a congressionally mandated wraparound demonstration. *Journal of Child and Family Studies, 12*(2), 135-156.
- Biegel, D. E., Song, L.-y., & Milligan, S. E. (1995). A comparative analysis of family caregivers' perceived relationships with mental health professionals. *Hospital and Community Psychiatry, 46*(5), 477-482.
- Blader, J. C. (2006). Which family factors predict children's externalizing behaviors following discharge from psychiatric inpatient treatment? *Journal of Child Psychology and Psychiatry, 47*(11), 1133-1142.
- Blaske, D. M., Borduin, C. M., & Henggeler, S. W. (1989). Individual, family, and peer characteristics of adolescent sex offenders and assaultive offenders. *Developmental Psychology, 25*(5), 846-855.
- Brannan, A. M., & Heflinger, C. A. (1997). 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, 5*(4), 212-223.

- Brannan, A. M., Heflinger, C. A., & Foster, E. M. (2003). The role of caregiver strain and other family variables in determining children's use of mental health services. *Journal of Emotional & Behavioral Disorders, 11*(2), 78-92.
- Brannan, A. M., Manteuffel, B., Holden, E. W., & Heflinger, C. A. (2006). Use of the Family Resource Scale in children's mental health: Reliability and validity among economically diverse samples. *Administration and Policy in Mental Health and Mental Health Services Research, 33*(2), 182-197.
- Brannan, A. M. a., & Heflinger, C. A. (2001). Distinguishing caregiver strain from psychological distress: Modeling the relationships among child, family, and caregiver variables. *Journal of Child and Family Studies, 10*(4), 405-418.
- Brannan, A. M. a., & Heflinger, C. A. (2006). Caregiver, child, family, and service system contributors to caregiver strain in two child mental health service systems. *Journal of Behavioral Health Services & Research, 33*(4), 408-422.
- Brook, J. S., Brook, D. W., Gordon, A. S., & Whiteman, M. (1990). The psychosocial etiology of adolescent drug use: A family interactional approach. *Genetic, Social, & General Psychology Monographs, 116*(2), 111-267.
- Bruns, E. J., & Burchard, J. D. (1998). Tracking behavioral progress within a children's mental health system: The Vermont community adjustment tracking system. *Journal of Emotional and Behavioral Disorders, 6*(1), 19-33.
- Bruns, E. J., Burchard, J. D., & Yoe, J. T. (1995). Evaluating the Vermont system of care: Outcomes associated with community based wraparound services. *Journal of Child and Family Studies, 4*(3), 321-339.
- Bussing, R., Zima, B. T., Gary, F. A., Mason, D. M., Leon, C. E., Sinha, K., et al. (2003). Social networks, caregiver strain, and utilization of mental health services among elementary school students at high risk for ADHD. *Journal of the American Academy of Child & Adolescent Psychiatry, 42*(7), 842-850.
- Canter, R. (1982). Family correlates of male and female delinquency. *Criminology, 20*(2), 149-167.
- Carney, M. M., & Buttell, F. (2003). Reducing juvenile recidivism: Evaluating the wraparound services model. *Research on Social Work Practice, 13*(5), 551-568.
- Caspi, A., Moffitt, T. E., Kim-Cohen, J., Morgan, J., Rutter, M., Taylor, A., et al. (2004). Maternal expressed emotion predicts children's antisocial behavior problems: Using monozygotic-twin differences to identify environmental effects on behavioral development. *Developmental Psychology, 40*(2), 149-161.
- Cauffman, E., Scholle, S. H., Mulvey, E., & Kelleher, K. J. (2005). Predicting first time involvement in the juvenile justice system among emotionally disturbed youth receiving mental health services. *Psychological Services, 2*(1), 28-38.
- Clark, R. T., Schaefer, M., Burchard, J. D., & Welkowitz, J. W. (1992). Wrapping community based mental health services around children with a severe behavioral disorder: An evaluation of project wraparound. *Journal of Child and Family Studies, 1*(3), 241-261.
- Cole, P. M., & Zahn-Waxler, C. (1992). Emotional dysregulation in disruptive behavior disorders. In D. Cicchetti & S. L. Toth (Eds.), *Rochester Symposium on Developmental Psychopathology* (Vol. 4: Developmental Perspectives on Depression, pp. 173-209). Rochester, NY: University of Rochester Press.

- Connor, T., Phan, D. L., & Stephens, R. L. (2002). *Survival analysis of arrest data in the longitudinal comparison study*. Paper presented at the A System of Care for Children's Mental Health: Expanding the Research Base., Tampa, FL.
- Cook, J. A., Hoffschmidt, A., Cohler, B. J., & Pickett, S. A. (1992). Marital satisfaction among parents of the severely mentally ill living in the community. *American Journal of Orthopsychiatry*, 62, 552-563.
- Cook, J. A., & Pickett, S. A. (1988). Feelings of Burden and Criticalness Among Parents Residing with Chronically Mentally Ill Offspring. *Journal of Applied Social Science*, 12(1), 79-107.
- Derisley, J., Libby, S., Clar, S., & Reynolds, S. (2005). Mental health, coping and family functioning in parents of young people with obsessive-compulsive disorder and with anxiety disorders. *British Journal of Clinical Psychology*, 44, 439-444.
- Dilworth-Anderson, P. (1989). Family structure and intervention strategies: Beyond empirical research. *Annals of the New York Academy of Sciences*, 565, 183-188.
- Donner, R., Huff, B., Gentry, M., McKinney, D., Duncan, J., Thompson, S., et al. (1995). Expectations of case management for children with emotional problems. In B. J. Friesen & J. Poertner (Eds.), *From case management to service coordination for children with emotional, behavioral, or mental disorders: Building on family strengths* (pp. 27-36). Baltimore: Brookes.
- Dumas, J. E. (1986). Parental perception and treatment outcome in families of aggressive children: A causal model. *Behavior Therapy*, 17(4), 420-432.
- Dunst, C. J., Leet, H. E., & Trivette, C. M. (1988). Family resources, personal well-being, and early intervention. *The Journal of Special Education*, 22(1), 108-116.
- Early, T. J., Gregoire, T. K., & P., M. T. (2002). Child functioning and caregiver well-being in families of children with emotional disorders: A longitudinal analysis. *Journal of Family Issues*, 23(3), 374-391.
- Eber, L., Osuch, R., & Redditt, C. A. (1996). School based applications of the wraparound process: Early results on service provision and student outcomes. *Journal of Child and Family Studies*, 5(1), 83-99.
- Elgar, F. J., Knight, J., Worrall, G., & Sherman, G. (2003). Attachment characteristics and behavioural problems in rural and urban juvenile delinquents. *Child Psychiatry and Human Development*, 34(1), 35-48.
- Epstein, M. H. (1999). The development and validation of a scale to assess the emotional and behavioral strengths of children and adolescents. *Remedial and Special Education*, 20(5), 258-263.
- Epstein, M. H., Harniss, M. K., Pearson, N., & Ryser, G. (1999). The behavioral and emotional rating scale: Test-retest and inter-rater reliability. *Journal of Child and Family Studies*, 8(3), 319-327.
- Epstein, M. H., Ryser, G., & Pearson, N. (2002). Standardization of the behavioral emotional rating scale: Factor structure, reliability, and criterion validity. *Journal of Behavioral Health Services and Research*, 29(2), 208-216.
- Evans, M. E., Armstrong, M. I., & Kuppinger, A. D. (1996). Family centered intensive case management: A step toward understanding individualized care. *Journal of Child and Family Studies*, 5(1), 55-65.

- Faraone, S. V., Biederman, J., Keenan, K., & Tsuang, M. T. (1991). Separation of DSM-III attention deficit disorder and conduct disorder: Evidence from a family-genetic study of American child psychiatric patients. *Psychological Medicine, 21*(1), 109-121.
- Farmer, E., & Burns, B. J. (1997). Impact of children's mental health problems on families: Relationships with service use. *Journal of Emotional and Behavioral Disorders, 5*(4), 230-239.
- Foster, E. M. (1999). Do aftercare services reduce inpatient psychiatric readmissions? *Health Services Research, 34*, 715-736.
- Foster, E. M. (2000). Does the continuum of care reduce inpatient length of stay? *Evaluation and Program Planning, 23*, 53-65.
- Foster, E. M., Qaseem, A., & Connor, T. (2004). Can better mental health services reduce the risk of juvenile justice system involvement? *American Journal of Public Health, 94*(5), 859-865.
- Frick, P. J., Lahey, B. B., Loeber, R., Stouthamer-Loeber, M., Christ, M. G., & Hanson, K. W. (1992). Familial risk factors to oppositional defiant disorder and conduct disorder: Parental psychopathology and maternal parenting. *Journal of Consulting and Clinical Psychology, 60*(1), 49-55.
- Friesen, B., & Huff, B. (1996). Family perspectives on systems of care. In B. A. Stroul (Ed.), *Children's mental health: Creating systems of care in a changing society* (pp. 41-67). Baltimore: Brookes.
- Gabel, S., Stallings, M. C., Young, S. E., Schmitz, S., Crowley, T. J., & Fulker, D. W. (1998). Family variables in substance-misusing male adolescents: The importance of maternal disorder. *American Journal of Drug and Alcohol Abuse, 24*(1), 61-84.
- Garland, A. F., Lau, A. S., Yeh, M., McCabe, K., Hough, R. L., & Landsverk, J. A. (2005). Racial and ethnic differences in utilization of mental health services among high risk youth. *American Journal of Psychiatry, 162*(7), 1336-1343.
- Glisson, C. (1994). The effect of services coordination teams on outcomes for children in state custody. *Administration in Social Work, 18*(4), 1-23.
- Gove, W. R., & Crutchfield, R. D. (1982). The family and juvenile delinquency. *Sociological Quarterly, 23*(3), 301-319.
- Hawkins, J. D., & Catalano, R. F., Jr. (1992). *Communities that care: Action for drug abuse prevention*. San Francisco, CA: Jossey-Bass.
- Heflinger, C. A., & Taylor-Richardson, K. D. (2004). Caregiver strain in families of children with serious emotional disturbance: Does relationship to child make a difference? *Journal of Family Social Work, 8*(1), 27-45.
- Henggeler, S. W., Burr-Harris, A. W., Borduin, C. M., & McCallum, G. (1991). Use of the family adaptability and cohesion evaluation scales in child clinical research. *Journal of Abnormal Child Psychology, 19*(1), 53-63.
- Holden, E. W., Connor, T., O'Connell, S. R., Blau, G., Long, D., Hoff, D., et al. (2002). *Mental health outcomes from a randomized experiment within Connecticut's child welfare system*. Paper presented at the A System of Care for Children's Mental Health: Expanding the Research Base, Tampa, FL.
- Hurley, S., Goldsmith, T., & Lord, G. (2003). *Not all managed care plans are created equal: Differences in mental health service provision, program participation, and outcomes among medicaid program participants*. Paper presented at the A System of Care for Children's Mental Health: Expanding the Research Base, Tampa, FL.

- Huz, S., McNulty, T. L., & Evans, M. E. (2000). *Child and family outcomes from intensive case management for children with serious emotional disturbance in New York state*. Paper presented at the A System of Care for Children's Mental Health: Expanding the Research Base, Tampa, FL.
- Hyde, K., Burchard, J. D., & Woodworth, K. (1996). Wrapping services in an urban setting. *Journal of Child and Family Studies, 5*(1), 67-82.
- Joyner, J. I. (1992). *Method to assess client progress in a case management agency*. Paper presented at the A System of Care for Children's Mental Health: Expanding the Research Base, Tampa, FL.
- Kang, E., Brannan, A. M. a., & Heflinger, C. A. (2005). Racial differences in response to the caregiver strain questionnaire. *Journal of Child and Family Studies, 14*(1), 43-56.
- Katz, L. F., & Gottman, J. M. (1993). Patterns of marital conflict predict children's internalizing and externalizing behaviors. *Developmental Psychology, 29*(6), 940-950.
- Kumpfer, K. L., & DeMarsh, J. P. (1986). Family environmental and genetic influences on children's future chemical dependency. In S. Griswold-Ezekoye, K. L. Kumpfer & W. Bukoski (Eds.), *Childhood and Chemical Abuse: Prevention and Intervention* (pp. 49-91). New York, NY: Haworth.
- Lambert, E. W., Brannan, A. M., Breda, C., Heflinger, C. A., & Bickman, L. (1998). Common patterns of service use in children's mental health. *Evaluation and Program Planning, 21*, 47-57.
- Lange, G., Sheerin, D., Carr, A., Dooley, B., Barton, V., Marshall, D., et al. (2005). Family factors associated with attention deficit hyperactivity disorder and emotional disorders in children. *Journal of Family Therapy, 27*, 76-96.
- Lecavalier, L., Leone, S., & Wiltz, J. (2006). The impact of behaviour problems on caregiver stress in young people with autism spectrum disorders. *Journal of Intellectual Disability Research, 50*(3), 172-183.
- Leff, J., & Vaughn, C. E. (Eds.). (1985). *Expressed emotion in families*. New York: Guilford.
- Lefley, H. P. (1996). *Family Caregiving in Mental Illness*. Newbury Park, CA: Sage.
- Leinonen, J., Solantaus, T., & Punamaki, R.-L. (2003). Parental mental health and children's adjustment: The quality of marital interaction and parenting as mediating factors. *Journal of Child Psychology and Psychiatry, 44*(2), 227-241.
- Loeber, R. (1990). Development and risk factors of juvenile antisocial behavior and delinquency. *Clinical Psychology Review, 10*(1), 1-41.
- Lyons, J. S. (2004). *Redressing the emperor: Improving our children's public mental health system*. Westport, CT: Praeger Publishers.
- Matherne, M. M., & Thomas, A. (2001). Family environment as a predictor of adolescent delinquency. *Adolescence, 36*(144), 655-664.
- McCammom, S. L., Spencer, S. A., & Friesen, B. J. (2001). Promoting family empowerment through multiple roles. In D. A. J. Dosser & D. S. Handron (Eds.), *Child mental health: Exploring systems of care in the new millennium* (pp. 1-24). New York, NY: Haworth Press, Inc.
- McCarty, C. A., & Weisz, J. R. (2002). Correlates of expressed emotion in mothers of clinically referred youth: An examination of the five-minute speech sample. *Journal of Child Psychology and Psychiatry, 43*(6), 759-768.
- McDonald, T. P., & Gregoire, T. K. (1997). Building a model of family caregiving for children with emotional disorders. *Journal of Emotional and Behavioral Disorders, 5*(3), 138-149.

- McGrew, K. S., Gilman, C. J., & Johnson, S. (1992). A review of scales to assess family needs. *Journal of Psychoeducational Assessment, 10*, 4-25.
- Modrcin, M. J., & Robison, J. (1991). Parent of children with emotional disorders: Issues for consideration and practice. *Community Mental Health Journal, 27*, 281-292.
- Morgan, C. J., Cauce, A. M., Wagner, V., & Moore, E. (2000). *Effectiveness of intensive case management for homeless adolescents after twelve months*. Paper presented at the A System of Care for Children's Mental Health: Expanding the Research Base, Tampa, FL.
- Nelson, J. R., Stage, S., Duppong-Hurley, K., Synhorst, L., & Epstein, M. H. (2007). Risk factors predictive of the problem behavior of children at risk for emotional and behavioral disorders. *Exceptional Children, 73*(3), 367-379.
- Offord, D. R. (1982). Family backgrounds of male and female delinquents. In J. Gunn & D. P. Farrington (Eds.), *Delinquency and the criminal justice system*. New York, NY: Wiley.
- Parker, G., & Hadzi-Pavlovich, D. (1990). Expressed emotion as a predictor of schizophrenic relapse: An analysis of aggregated data. *Psychological Medicine, 20*, 961-965.
- Phan, D. L., & Bell, Q. (2002). *Delinquent and substance use behaviors among children involved in systems of care*. Paper presented at the A System of Care for Children's Mental Health: Expanding the Research Base, Tampa, FL.
- Pinheiro, J. C., & Bates, D. M. (2000). *Mixed-effects models in S and S-Plus*. New York: Springer.
- Pinheiro, J. C., Bates, D. M., DebRoy, S., & Sarkar, D. (2007). NLME: Linear and nonlinear mixed effects models [Computer software and manual]. .
- Prange, M. E., Greenbaum, P. E., Silver, S. E., Friedman, R. M., Kutash, K., & Duchnowski, A. J. (1992). Family functioning and psychopathology among adolescents with severe emotional disturbances. *Journal of Abnormal Child Psychology, 20*(1), 83-102.
- Pressman, L. J., Loo, S. K., Carptner, E. M., Asarnow, J. R., Lynn, D., McCracken, J. T., et al. (2006). Relationship of family environment and parental psychiatric diagnosis to impairment in ADHD. *Journal of the American Academy of Child & Adolescent Psychiatry, 45*(3), 346-354.
- R Development and Core Team. (2007). R: A language and environment for statistical computing [computer software and manual].
- Robbins, V., & Collins, K. (2002). *Building bridges of support in eastern Kentucky: Outcomes of students receiving school-based wraparound*. Paper presented at the A System of Care for Children's Mental Health: Expanding the Research Base, Tampa, FL.
- Robins, L. N. (1981). Epidemiological approaches to natural history research: Children's antisocial disorders. *Journal of the American Academy of Child Psychiatry, 20*, 566-580.
- Stephens, R. L., Holden, E. W., & Hernandez, M. (2004). System-of-care practice review scores as predictors of behavioral symptomatology and functional impairment. *Journal of Child and Family Studies, 13*(2), 179-191.
- Stephens, R. L., Phan, D. L., & Greenbaum, P. E. (2003). *General growth mixture modeling (GGMM) of alcohol use patterns in the longitudinal comparison study*. Paper presented at the A System of Care for Children's Mental Health: Expanding the Research Base, Tampa, FL.
- Stern, S. B. (2004). Evidence-Based Practice with Antisocial and Delinquent Youth: The Key Role of Family and Multisystemic Intervention. In H. E. Briggs & T. L. Rzepnicki (Eds.), *Using evidence in social work practice: Behavioral perspectives* (pp. 104-127). Chicago, IL: Lyceum Books, Inc.

- Stroul, B. A., & Friedman, R. M. (1986). *A system of care for children and youth with severe emotional disturbances* (rev. ed.). Washington, DC: Georgetown University Child Development Center, National Technical Assistance Center for Children's Mental Health.
- Stroul, B. A., & Friedman, R. M. (1988a). Principles for a system of care. *Children Today*, 17(4), 11-15.
- Stroul, B. A., & Friedman, R. M. (1988b). Putting principles into practice. *Children Today*, 17(4), 15-17.
- Taylor-Richardson, K. D., Heflinger, C. A., & Brown, T. N. (2006). Experience of strain among types of caregivers responsible for children with serious emotional and behavioral disorders. *Journal of Emotional and Behavioral Disorders*, 14(3), 157-168.
- Thompson, E. H., & Doll, W. (1982). The burden of families coping with the mentally ill: An invisible crisis. *Family Relations*, 31, 379-388.
- Tolan, P. (1988). Socioeconomic, family, and social stress correlates of adolescent antisocial and delinquent behavior. *Journal of Abnormal Child Psychology*, 16(3), 317-331.
- U. S. Department of Health & Human Services. (1999). *Mental Health: A Report of the Surgeon General*.
- Walker, J. S., & Schutte, K. M. (2004). Practice and process in wraparound teamwork. *Journal of Emotional and Behavioral Disorders*, 12(3), 182-192.
- Walrath, C. M., Ybarra, M. L., & Holden, E. W. (2006). Understanding the pre-referral factors associated with differential 6-month outcomes among children receiving system-of-care services. *Psychological Services*, 3(1), 35-50.
- Wright, E. R., Wright, D. E., Kooreman, H. E., & Anderson, J. A. (2005). *The nature and impact of conflict within service coordination teams for children and adolescents with serious emotional and behavioral challenges*. Manuscript submitted for publication.
- Yatchmenoff, D. K., Koren, P. E., Friessen, B. J., Gordon, L. J., & Kinney, R. F. (1998). Enrichment and stress in families caring for a child with a serious emotional disorder. *Journal of Child and Family Studies*, 7, 129-145.
- Yoe, J. T., Santarcangelo, S., Atkins, M., & Burchard, J. D. (1996). Wraparound care in Vermont: Program development, implementation, and evaluation of a statewide system of individualized services. *Journal of Child and Family Studies*, 5(1), 23-39.
- Zill, N. (1993). The changing realities of family life. *The Aspen Institute Quarterly*, 5, 1-25.

Table 1. Sample Characteristics (N = 8518).

	N	(%)
<b>Race</b>		
Non-Caucasian	3,492	41.0
Caucasian	4,050	47.5
Unknown	976	11.5
<b>Gender</b>		
Male	5,604	65.8
Female	2777	32.6
Unknown	137	1.6
<b>Referral Source</b>		
Mental Health	2883	33.8
Court/Corrections	1122	13.2
Child Welfare	872	10.2
Other	636	7.5
Physical Health	97	1.1
Self/Caregiver	668	7.8
Education	1399	16.4
Unknown	841	9.9
<b>Age at Enrollment</b>		
	M	SD
	12.0	3.6

<sup>1</sup>Percentages may not sum to 100% due to rounding.

Table 2. Family and Caregiver Characteristics

	N	(%)
<b>Caregiver Education</b>		
Less than high school diploma	1904	23.0
High School diploma/GED	2704	32.5
Associate degree	619	7.4
Some college, no degree	1623	19.5
Bachelor's degree	511	6.1
Master's degree	198	2.4
Professional school degree	125	1.5
Doctoral degree	24	0.3
Unknown	607	7.3
<b>Annual Family Income</b>		
Less than \$5,000	1025	12.3
\$5,000-\$9,999	1117	13.4
\$10,000-\$14,999	1293	15.6
\$15,000-\$19,999	902	10.8
\$20,000-\$24,999	808	9.7
\$25,000-\$34,999	877	10.5
\$35,000-\$49,999	730	8.8
\$50,000-\$74,999	487	5.9
\$75,000-\$99,999	161	1.9
\$100,000 and over	106	1.3
Unknown	809	9.7
<b>Family History</b>		
Domestic violence/Spousal Abuse	4000	48.1
Mental illness	4485	53.9
Criminal conviction/s	3711	44.6
Substance abuse	5143	61.9
<b>Custody Status of Child</b>		
Two biological or one biological and one step-parent	2060	24.8
Biological mother only	3693	44.4
Biological father only	344	4.1
Adoptive parent/s	385	4.6
Foster parent/s	45	.5
Other family relative or friend	715	8.6
Ward of the State	688	8.3
Other custody arrangement	206	2.5
Unknown	179	2.2
	<b>M</b>	<b>SD</b>
Caregiver age	40.5	9.9
<b>Family Measures</b>		
Caregiver Strain Questionnaire (Global Strain)	2.9	.9
Family Resource Scale	3.6	.7
Family Assessment Device	2.9	.5

Table 3. Multilevel models of change for the CBCL

Parameter	Model		
	Means Only	Growth	Interactions
Intercept	67.222*** (67.003, 67.440)	69.406*** (69.180, 69.633)	73.805*** (72.990, 74.620)
Wave		-1.931*** (-2.022, -1.841)	-0.920*** (-1.007, -0.832)
FRS			-0.022*** (-0.029, -0.014)
FAD			-0.956*** (-1.282, -0.631)
CGSQ			5.696*** ( 5.532, 5.861)
FRS x FAD			0.023** (0.009, 0.037)
FRS x CGSQ			0.012*** (0.005, 0.019)
FAD x CGSQ			0.625*** (0.331, 0.920)
FRS x FAD x CGSQ			0.016** (0.004, 0.028)
<i>Referral Source</i>			
Court/Corrections			-1.828*** (-2.443, -1.213)
Child Welfare			-0.032 (-0.713, 0.649)
Other			-1.375*** (-2.161, -0.589)
Physical Health			-0.070 (-1.891, 1.751)
Self/Caregiver			-1.099** (-1.828, -0.369)
Education			0.020 (-0.510, 0.550)
Female			1.141*** ( 0.582, 1.699)
Race			-1.421*** (-1.893, -0.948)
Race x Female			-0.257 (-1.081, 0.568)
Age			-0.391***

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			(-0.454, -0.328)
s	7.514928	6.449378	5.693115
Pseudo $R^2$		0.263	0.426
AIC	164042.100	161385.300	119512
BIC	164066	161433	119690.3
LL	-82018	-80687	-59732.98

Note. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ . Note. Values in parentheses denote the lower and upper 95% confidence limits.

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Table 4. Multilevel models of change for the BERS

Parameter	Means Only	Model Growth	Interactions
Intercept	42.044*** (41.797, 42.291)	40.938*** (40.667, 41.210)	43.855*** (42.937, 44.773)
Wave		0.934*** (0.830, 1.039)	-0.147 (-0.044, 0.058)
FRST			0.018*** (0.009, 0.027)
FADTA			5.533*** (5.142, 5.924)
CGSQ			-5.026*** (-5.223, -4.829)
FRST x FADTA			-0.034*** (-0.050, -0.017)
FRST x CGSQ			-0.017*** (-0.025, -0.009)
FADTA x CGSQ			-0.912*** (-1.268, -0.556)
FRST x FADTA x CGSQ			-0.019* (-0.033, -0.004)
<i>Referral Source</i>			
Court/Corrections			-0.441 (-1.134, 0.253)
Child Welfare			-1.305*** (-2.073, -0.539)
Other			0.506 (-0.371, 1.382)
Physical Health			-0.284 (-2.266, 1.697)
Self/Caregiver			-0.157 (-0.963, 0.649)
Education			-0.207 (-0.802, 0.388)
Female			-5.609*** (-6.238, -4.981)
Race			1.656*** (1.127, 2.184)
Race x Female			-0.985* (-1.909, -0.062)
Age			-0.008

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			(-0.079, 0.062)
s	8.624	8.036	7.132334
Pseudo $R^2$		0.132	0.316
AIC	167968	167388	127658.8
BIC	167992	167436	127837.6
LL	-83981	-83688	-63806.42

Note. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ . Note. Values in parentheses denote the lower and upper 95% confidence limits.

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