Journal of Emotional and Behavioral Disorders
Volume 16 Number 2
June 2008 90-104

10.1177/1063426607313120
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Patterns of Clinical Functioning Over Time for Young People Served in a System of Care

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Few studies have examined the longitudinal impact that systems of care (SOCs) have on the clinical functioning of young people. This study investigated patterns of clinical improvement over time in an SOC and explored the degree to which demographic characteristics and referral source affected those patterns. Data were gathered at the time of enrollment in the SOC and collected at 6-month intervals, up to 36 months. Clinical change was assessed with three measurement tools, using hierarchical linear modeling to examine change patterns longitudinally. Results indicated that there were several clinical differences at the time of enrollment that were associated with specific demographic characteristics or referral source. Findings also indicated that clinically and statistically significant improvements occurred over time, with little regard to participants' demographic characteristics or source of referral. These findings lend support to the potential of SOCs to improve youth outcomes and suggest that such improvements appear regardless of individual-level differences among participants.

Keywords: *systems of care; child mental health; change over time; hierarchical linear modeling; emotional and behavioral disorders*

In the late 1970s and early 1980s, Jane Knitzer (1982) and others (e.g., Behar, 1985; Namir & Weinstein, 1982; Shore & Mannino, 1976) painted a grim picture of the U.S. mental health system for children: one that was fragmented, parent blaming, and limited to either restrictive and expensive residentially based programming or outpatient therapy, with little else to offer those seeking services. Many in the field of children's mental health responded to this situation with a rallying cry for change and began advocating for the development of community-based systems of care (SOCs) for young people with serious emotional and behavioral disorders (EBD) and their families (Behar, 1985; Bruns & Burchard, 1998; Lyons, 2004). Philosophies, values, and principles of care for SOCs were developed and articulated, and by the mid-1980s, Stroul and Friedman (1986) had defined an SOC as "a comprehensive spectrum of mental health and other necessary services which are organized into a coordinated network to meet the multiple and changing needs of children and adolescents" and their families (p. 3). During the ensuing 20 years, the SOC movement has brought about the creation of a variety of innovative approaches to service provision for young people who are involved with multiple child-serving systems (e.g., mental health, child welfare, juvenile justice, education) and their families (Kutash, Duchnowski, & Friedman, 2005). These reform efforts have initiated political, philosophical, and practical transformations in service provision that are intended to circumvent historical barriers to interagency collaboration, such as separate funding streams and competing agency mandates, so that partnerships can be created across child-serving systems and among families and professionals (Handron, Dosser, McCammon, & Powell, 1998; Hernandez & Hodges, 2003). The overarching goal of SOCs is the organization and coordination

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Authors' Note: This study was supported in part by a grant from the Comprehensive Community Mental Health Services for Children and Families Program of the Center for Mental Health Services, Substance Abuse Service Administration (Grant No. 6 HS5 SM52910) to Marion County Health and Hospital Corporation and Choices, Inc. Please address correspondence to Jeffrey A. Anderson, Center for Adolescent and Family Studies, School of Education, Indiana University, Room 3232, 201 N. Rose Avenue, W. W. Wright Education Building, Bloomington, IN 47405; e-mail: jander2@indiana.edu.

of children's educational, social, and therapeutic services, along with informal family and community supports, in order to better meet the complex needs of children with EBD and their families (Stroul & Friedman, 1986).

As the SOC concept continues to gain in popularity, evaluation findings from these approaches also are emerging (Kutash et al., 2005). Because a fundamental purpose of the SOC-type approach is to improve the clinical functioning of the young people who participate, researchers are exploring the degree to which SOCs lead to improved outcomes (Foster, Stephens, Krivelyova, & Gamfi, 2007). A number of studies have documented and described the clinical characteristics of young people in specific SOCs (e.g., Epstein & Cullinan, 1995; Epstein, Cullinan, Quinn, & Cumblad, 1994; Landrum, Singh, Nemil, Ellis, & Best, 1995; Singh, Landrum, Donatelli, Hampton, & Ellis, 1994). For example, researchers have reported that youth tend to enter SOCs with serious levels of clinical impairment (Anderson, Wright, Kooreman, Mohr, & Russell, 2003; Manteuffel, Stephens, & Santiago, 2002; Walrath & Liao, 2005), and in one local study, the authors further reported that being younger at enrollment predicted greater functional improvement while in the SOC, as compared to being older at enrollment (Anderson, Effland, Kooreman, & Wright, 2006). Likewise, children who were younger at enrollment also were found to be more likely to successfully complete their SOC treatment goals than were children who were older at enrollment (Wright, Kooreman, & Anderson, 2004). Researchers also have examined clinical differences in children and youth based on the service system that referred them to the SOC for treatment (e.g., A. Rosenblatt & Rosenblatt, 2000; J. A. Rosenblatt & Robertson, 1998; Walrath, 2001). For example, Walrath, dosReis, and colleagues (2001) reported that young people who were referred to the SOC by their families or from the child welfare system tended to have lower functional challenges at enrollment than did youth referred from other sources, such as school, mental health, or juvenile justice. Descriptive studies also have confirmed that young people entering from child welfare, mental health, public school, or juvenile justice may differ on the type and degree of clinical challenges they are experiencing when they enter the SOC (A. Rosenblatt & Rosenblatt, 2000; J. A. Rosenblatt & Robertson, 1998; Walrath, 2001; Walrath, dosReis, et al., 2001; Walrath et al., 2004).

A review of preliminary outcome studies examining SOC-type approaches indicates that children and youth appear to benefit clinically from receiving a coordinated mix of services. For example, a study by Hodges, Doucette-Gates, and Liao (1999) found that the levels of functional impairment in a national sample of children decreased significantly after 6 months of participation in an SOC. Young people participating in SOCs also have been reported as demonstrating improved functioning at home (e.g., Clark, Schaefer, Burchard, & Welkowitz, 1992; Hyde, Burchard, & Woodworth, 1996; Joyner, 1992), at school (e.g., Anderson, 2007; Eber, Osuch, & Redditt, 1996; Robbins & Collins, 2002), and in overall behavior (Anderson et al., 2003; Bruns, Burchard, & Yoe, 1995; Evans, Armstrong, & Kuppinger, 1996; Huz, McNulty, & Evans, 2000; Phan & Bell, 2002; Yoe, Santarcangelo, Atkins, & Burchard, 1996). Furthermore, the limited available longitudinal national data suggest that the clinical improvements reported for young people served in SOCs appear to remain stable for at least 24 months (Manteuffel et al., 2002). However, findings from studies using more rigorous research designs incorporating control groups have reported mixed results (e.g., Foster et al., 2007). Some researchers have found no differences in improvement between young people receiving and not receiving services through SOCs (Bickman, 1996; Bickman, Smith, Lambert, & Andrade, 2003; Carney & Buttell, 2003; Connor, Phan, & Stephens, 2002; Morgan, Cauce, Wagner, & Moore, 2000; Stephens, Phan, & Greenbaum, 2003), whereas other researchers have described more improvement for young people receiving services that adhere to SOC principles (Foster, Qaseem, & Connor, 2004; Holden et al., 2002; Stephens, Holden, & Hernandez, 2004).

The tentativeness of findings in the empirical literature base for SOCs should not be considered unusual, especially given the challenges of conducting evaluation studies examining complex social interventions (Knapp, 1995). Because an SOC is contextualized by numerous local factors, the impact it will have on a child's clinical functioning will depend on a host of variables, many of which cannot be easily measured or replicated in studies across sites. This adds to the complexity of understanding who improves in SOCs and the factors that are associated with improvement (Farmer, 2000). As Kutash and her colleagues (2005) noted, although findings from the few existing comparison studies tend to favor SOC sites over control sites, child-level outcomes have been more ambiguous. The limited and uncertain information about SOC outcomes, at least in part, stems from the difficulty of studying multilayered, multifaceted service systems (A. Rosenblatt, 2005). Thus, consensus about SOC effectiveness will likely only emerge as the evidence from many site-specific studies is compiled and examined (Foster et al., 2007). As such, the purpose of this study was to add to the literature base by examining the patterns of clinical improvement over time for children and adolescents served in a specific SOC and to explore the degree to which gender, age, ethnicity, and referral source affected those patterns.

Method

This section begins with a description of the setting for this study, followed by the data collection procedures, including a description of the three outcome measures used to capture levels of child and youth strengths, functionality, and impairment over time. It ends with descriptions of Dawn Project participants and the sample used in this study.

Setting

The Dawn Project was created in l997 from a grassroots initiative of state, county, and local child-serving leaders and providers from central Indiana and the greater Indianapolis metropolitan area. The Dawn Project is administered by Choices, Inc., a nonprofit care management organization that provides service coordination and wraparound services to children with EBD and their families. Young people can be referred to the Dawn Project from child welfare, juvenile justice, mental health, and education. Children and youth typically are referred because they are considered to be among the most difficult youth to serve in terms of their emotional and behavioral challenges and also because they are involved with more than one child-serving system (e.g., mental health, special education, probation, child welfare; Anderson et al., 2003).

Once enrolled in the Dawn Project, a care coordinator works with the family to conduct an intake assessment that is used to determine who should be part of the child and family team. These teams are at the core of the Dawn Project SOC and include representatives from each system and agency with which the child and family currently are working, as well as a family's natural supports, such as friends, neighbors, relatives, and significant others (Wright, Russell, Anderson, Kooreman, & Wright, 2006). A hallmark of the child and family team process is that decision making is family driven and consensus based. Dawn Project teams can access more than 75 different services, including medical, respite, behavioral health, service coordination, placement, mentoring, and discretionary funding (Wright et al., 2004). Teams adhere to SOC and wraparound principles and have the authority to determine the kind and intensity of services needed while also working to strengthen the natural supports available to the family. Teams develop treatment objectives and then implement comprehensive, multidomain plans for achieving those goals. Objectives often include reduced reliance on restrictive residential services, increased family independence, increased attendance and achievement at school, and improved functioning at home. At monthly meetings, teams discuss progress and adjust treatment plans as needed (Wright et al., 2006). Preliminary studies using the *Wraparound Fidelity Index* have suggested that Dawn Project child and family teams tended to exhibit higher fidelity to the wraparound philosophy than did a national sample of such teams (Bruns, 2004). Children exit the Dawn Project when their teams agree that treatment goals have been accomplished, with the average length of involvement reported to be approximately 14 months (Anderson et al., 2006).

Data Collection Procedures

The data for the current study came from the evaluation system that was implemented from 1999 to 2005 through federal funding to the Dawn Project to enhance the services delivered to children with EBD and to record their outcomes. The evaluation system required data to be collected through in-depth interviews with parents whose children were enrolled and also with Dawn Project youth who were older than 11. Evaluation data also were collected on variables internal to the program, such as clinical factors, through the electronic charting system used by Dawn Project staff. During the intake process, program staff described the program evaluation activities to parents and caretakers and asked for their participation. In accordance with the protection-of-human-subjects protocol approved for this study, potential participants in the evaluation were assured that their participation was voluntary, their decision to participate would not affect the services their children received, and they could withdraw from evaluation activities at any time.

All data collection was completed through face-to-face interviews with youth and caregivers by trained data collectors. Training for data collectors included 20 hours of computer-aided classroom-type instruction followed by 20 hours of supervised field training, which included observing a senior interviewer conduct at least two interviews and then being observed conducting at least two interviewers by either the field supervisor or a senior interviewer. To help ensure the quality of data collection, the field supervisor regularly observed interviews to ensure that all data collectors were following the approved interview and human-subjects protocols. Youth interviews were conducted at enrollment and then at 6-month intervals, up to and including 36 months. The total number of possible follow-up data points for this study, excluding baseline, is six (i.e., 6, 12, 18, 24, 30, and 36 months). The range of data points for participants in the study was one to six. Of participants who had one or more follow-up interviews, 22.8% of the sample had only one follow-up point, 23.5% had two follow-up points, 18.6% had three, 18.3% had four, 12.5% had five, and 4.2% had six follow-up points. The 6-month ($n = 351$) and 12-month ($n = 278$) follow-up points had the most participants, followed by the 18-month ($n = 167$), 24-month ($n = 127$), 30-month ($n = 75$), and 36-month ($n = 31$) interviews.

Outcome Measures

Child and Adolescent Functional Assessment Scale (CAFAS). The CAFAS (Hodges, 1994) assesses the degree to which emotional, behavioral, or substance problems are disruptive to functioning. The CAFAS, which is completed as part of the 6-month evaluation interviews and scored by the interviewer, provides detailed behavioral descriptions for eight psychosocial domains: community, school, home, substance use, moods and emotions, self-harming behavior, behavior toward others, and thinking. The most severe level of impairment for each domain is scored based on the previous 180-day period. Higher scores indicate greater impairment: A score of 30 indicates severe disruption or incapacitation, 20 indicates moderate or persistent disruption, 10 indicates mild disruption, and 0 indicates no disruption of functioning. Aggregating domain scores provides a total score that ranges from 0 to 240. An overall score from 0 to 10 indicates minimal to no impairment, 20 to 40 indicates mild impairment, 50 to 90 indicates moderate impairment, 100 to 130 indicates marked impairment, and 140 and higher indicates severe impairment. Appropriate interrater reliability (Cross & McDonald, 1995; Hodges & Wong, 1996) and construct, concurrent, and discriminate validity of the CAFAS have been reported in the literature (e.g., Hodges, Lambert, & Summerfelt, 1994).

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. Impairment is assessed using 113 items that ask a child's caregiver to rate whether the problem is *not true of the child, somewhat true or sometimes true of the child,* or *very or often true of the 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 to 63 are considered borderline clinical, and scores above 63 are considered to be in the clinical range, whereas 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; Epstein & Sharma, 1998) 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 and 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 below 70 to above 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).

Analytic Strategies

Hierarchical linear and nonlinear modeling (HLM, version 6.03) was used to examine young people's clinical and behavioral change trajectories over time. HLM is an analytic approach designed for hierarchically nested data, such that in the present context observations are nested within person; in turn, this person may be nested within groups (Raudenbush & Bryk, 2002; Singer & Willet, 2003). HLM does not require equal spacing between measurement occasions within or across persons, nor does it require the same number of measurement occasions across persons. Missing data, a challenge frequently encountered in longitudinal studies of young people with EBD, are assumed to be missing completely at random or missing at random conditional on other variables in the model and tend not to pose any analytic difficulties (Gibbons et al., 1993; Raudenbush & Bryk, 2002).

The primary dependent variables in these analyses were continuous scale scores from the CBCL, CAFAS, and BERS. Because each of these instruments is designed to measure a fundamentally different construct, although they may be correlated, we elected to model each of them separately. Independent variables for this study included age (the age of the young person at the time she or he enrolled in the Dawn Project), gender (male or female); referral source (the system from which

Table 1
Demographic Comparison of Youth in Analysis Sample to Youth Not in Analysis Sample

	All Children		Children in Analysis		Children Not in Analysis			
	$N = 1{,}065$	%	$n = 354$	%	$n = 711$	%	χ^2	p
Race							1.13	.287
Caucasian	454	42.6	159	44.9	295	41.5		
Minority	611	57.4	195	55.1	416	58.5		
Gender							1.10	.294
Male	748	70.2	256	72.3	492	69.2		
Female	317	29.8	98	27.7	219	30.8		
Race by gender								
Caucasian boys	321	30.1	114	32.2	207	29.1	1.07	.301
Minority boys	427	40.1	142	40.1	285	40.1	0.00	.993
Caucasian girls	133	12.5	45	12.7	88	12.4	0.02	.876
Minority girls	184	17.3	53	15.0	131	18.4	1.97	.160
Referral source								
Child welfare	459	43.1	128	36.2	331	46.6	10.42	.001
Juvenile justice	368	34.6	138	39.0	230	32.3	4.60	.032
Education	200	18.8	61	17.2	139	19.5	0.83	.361
Mental health	38	3.6	27	7.6	11	1.5	25.40	.000
	M	*SD*	*M*	*SD*	*M*	*SD*	*t*	*p*
Age at enrollment	12.94	2.69	12.54	2.67	13.15	2.68	–3.48	.001

Note: Due to rounding, percentages may not sum to 100%.

the young person was referred to the SOC: child welfare, education, juvenile justice, or mental health); and race, which was collapsed from seven possible categories (Caucasian, African American, Asian, Native American, Hispanic, Biracial, other) into two categories (Caucasian and African American/other minority) because of the very small number of individuals from minority groups other than African American.

Sample Characteristics

Of the 1,065 youth and families who received services over the 5 years when the evaluation system was active, 354 (33%) volunteered to participate in data collection activities. The majority of the participating youth were male (72%) and African American, biracial, or from another minority group (55%), and they were about 13 years of age at enrollment into services (see Table 1). The majority of the youth were referred from either the child welfare (36%) or the juvenile justice (39%) systems. Analysis of the demographic characteristics of youth who participated in evaluation activities and those who did not revealed no significant differences between the groups in terms of race and gender; however, there were differences between the two groups on referral patterns and age. Specifically, the youth who participated were younger, $t(1{,}063) = -3.48$, $p = .001$, included fewer children from child welfare, $\chi^2(1, N = 458) = 10.42$, $p = .001$, more children from juvenile justice, $\chi^2(1, N = 367) = 4.60$, $p = .032$, and more children from mental health, $\chi^2(1, N = 37) = 25.40$, $p = .000$. Thus, the results presented here are limited to those youth included in the analyses and may not generalize to the entire population of youth served by the Dawn Project.

Results

This section presents the findings grouped by the three outcomes of interest: BERS, CBCL, and CAFAS. For the individual fixed effect parameters, the $t(z)$ was used (Note 1), and for the variance components, chi-square statistics are reported.

BERS. The grand mean of BERS scores in the unconditional means model was 89.99 ($p < .001$), which indicates the overall average BERS scores for all participants at all times (see Table 2, Model 1). The reliability of this intercept was .77. The ratio of the variance of the intercepts across the individuals to the total variance (i.e., the sum of the variance of the intercepts across the individuals and the error variance) provided the intraclass correlation ($\rho = .65$), suggesting that nearly two thirds (65%) of the total outcome variation was between individuals and 35% was within individuals. The unconditional growth model, which was fitted next, included time (i.e., the number of months since a young person had enrolled in the Dawn Project) as the only predictor. An examination (see Table 2, Model 2) showed that the mean value at initial

Table 2
Taxonomy of Multilevel Models of Change ($N = 305$) for the Behavioral and Emotional Rating Scale

Fixed Effects	Parameter	Model 1 Unconditional Means	Model 2 Unconditional Growth	Model Final
Initial status, π_{oi}				
Intercept	γ_{00}	89.99***	89.09***	79.30***
Child welfare	γ_{01}			8.22*
Juvenile justice	γ_{02}			3.10
Education	γ_{03}			2.36
Age	γ_{04}			0.27
Caucasian female	γ_{05}			–9.39**
African American male	γ_{06}			8.85***
African American female	γ_{07}			–2.91
Rate of change, π_{1i}				
Intercept	γ_{10}		.09	.50*
Child welfare	γ_{11}			–.10
Juvenile justice	γ_{12}			–.08
Education	γ_{13}			–.02
Age	γ_{14}			–.02
Caucasian female	γ_{15}			–.06
African American male	γ_{16}			–.23*
African American female	γ_{17}			–.29
Variance components				
Level 1				
Within-person	σ^2_ε	146.32	126.00	125.33
Level 2				
In initial status	σ^2_0	20,174.05***	209.76***	172.27***
In rate of change	σ^2_1		0.20***	0.19**
Covariance	σ_{01}		–2.59	–2.29
Covariance correlational coefficient	p		–.40	–.40
Interclass correlation		.54		
Intercept reliability		.765	.607	.564
Slope reliability			.255	.255
Pseudo R^2 statistics and goodness of fit				
R^2_ε			.14	.14
R^2_0				.18
R^2_1				.05
Deviance		9,999.97	9,974.78	9,903.75
Akaike information criterion		10,003	9,982	9,911

*$p < .05$. **$p < .01$. ***$p < .001$.

status (i.e., mean initial BERS score) of the sample was 89.09 ($p < .001$), and the mean slope was .09 ($p > .05$). The reliability of the intercept was .68, and the reliability of the slope was .26. The variance of initial status ($\sigma^2_0 = 209.76$, $p < .001$) was significant, as was the variance of the slope ($\sigma^2_1 = 0.20$, $p < .01$). Although the fixed effect for the slope was not significant, the nonzero variance implies that different individuals have different straight-line trajectories (i.e., slopes). Thus, although the mean slope may not have differed significantly from zero, there were individual differences in straight-line trajectories. Additionally, the pseudo R^2_ε showed that the proportion of variance accounted for by the linear effect of time was .138 (the residual variance declines from 146.32 to 126.00). In other words, comparing the unconditional straight-line change and the means-only models indicated that approximately 14% of the within-person variation in the BERS was associated with linear change over time. In summary, young people entered the Dawn Project with strengths-rating scores in the below-average range (i.e., 89.09) and improved at a nonsignificant rate of approximately 1 point every 11.11 months (see Table 5). Thus, by 36 months, the average score on the BERS had increased to 92.33. Although the change was not statistically significant, the average Dawn Project participant crossed the threshold of having strengths rated as below average to having strengths rated as average.

Next, we added the predictor variables of interest (i.e., age at enrollment, race, referral source) to the model (see Table 2, Final Model). In this final (see Singer & Willet, 2003) model, the initial status, 79.30 ($p < .001$) was statistically significant, and the reliability of the intercept was .65 (see Table 2). Three predictor variables also were statistically significant. First, young people referred by child welfare, when compared to those youth referred by mental health (i.e., the comparison group), had BERS scores at enrollment that, on average, were 8.22 points higher ($p < .05$). Second, African American boys had BERS scores that, on average, were 8.85 points higher ($p < .001$) than the comparison group of Caucasian boys. Third, Caucasian girls had BERS scores at enrollment

Table 3
Taxonomy of Multilevel Models of Change ($N = 305$) for the Child Behavior Checklist

Fixed Effects	Parameter	Model 1 Unconditional Means	Model 2 Unconditional Growth	Model Final
Initial status, π_{oi}				
Intercept	γ_{00}	68.41***	70.63***	81.22***
Child welfare	γ_{01}			–4.77*
Juvenile justice	γ_{02}			–2.89
Education	γ_{03}			0.38
Age	γ_{04}			–0.47*
Caucasian female	γ_{05}			3.18
African American male	γ_{06}			–5.64***
African American female	γ_{07}			–0.40
Rate of change, π_{1i}				
Intercept	γ_{10}		–.20***	–.25
Child welfare	γ_{11}			–.12
Juvenile justice	γ_{12}			–.17*
Education	γ_{13}			–.20*
Age	γ_{14}			.01
Caucasian female	γ_{15}			.04
African American male	γ_{16}			.11
African American female	γ_{17}			.12
Variance components				
Level 1				
Within-person	σ^2_ε	46.15	36.37	36.20
Level 2				
In initial status	σ^2_0	88.80***	82.97***	72.50***
In rate of change	σ^2_1		0.06***	0.06***
Covariance	σ^2_{01}		.03	.13
Covariance correlational coefficient	p		.014	.07
Interclass correlation		.66		
Intercept reliability		.84	.68	.65
Slope reliability			.26	.26
Pseudo R^2 statistics and goodness of fit				
R^2_ε			.21	.21
R^2_0				.13
R^2_1				0
Deviance		8,741.78	8,629.97	8,593.11
Akaike information criterion			8,637.97	8,601.11

$^*p < .05$. $^{***}p < .001$.

that were an average of 9.39 points lower ($p < .01$) than the Caucasian boy comparison group.

The slope ($\gamma_{10} = .50, p < .05$) also was statistically significant and its reliability was .26. The only predictor variable that was associated with a statistically significantly rate of change over time was African American boys, who showed a rate of change in their average BERS scores over time that was, on average, .23 points slower ($p < .05$) than the comparison group, Caucasian boys.

Comparing the conditional variance components (so called because they are conditioned on the added variables) of this final model with those from the unconditional growth model suggested that within-person variance was quite similar for both models. In the final model, two additional pseudo R^2 statistics were compared to the baseline unconditional growth model, which illustrate how the addition of the predictor variables influenced the model's effects. The first pseudo R^2 (R^2_0) provided an indication of change in initial status that resulted from the addition of the predictor variables. The decline from 209.76 to 172.27 suggested that 17.8% of the variance in the initial status of the final model was explained by this set of predictors. The second pseudo R^2 (R^2_1) provided an indication of amount of change in the results of the rate of change over time from the addition of the predictor variables. The decline from .20 to .19 suggested that 5% of the variance in the slope of the final model was explained by this set of predictors.

Finally, we explored goodness-of-fit measures for these three BERS models (see Table 2). Singer and Willet (2003) reported that there is little agreement in the field about comparing HLM but suggested that the deviance statistic may have the most support. Examination of both the deviance statistic and the Akaike information criterion (see Table 2) suggested that the final model fit better than either of the baseline models (unconditional means and growth respectively).

CBCL. The unconditional means model (see Table 3, Model 1) showed the overall grand mean of CBCL scores to be 68.41 ($p < .001$). The reliability of initial status was .84. Both variance components were statistically significant, suggesting that there was outcome variation in this model available for prediction. The interclass correlation in Model 1 across Level 1 and Level 2 ($\rho = .66$) indicated that 66% of the total outcome variation was located between individuals and 34% was within individuals.

An examination of unconditional growth model for the CBCL (see Table 3, Model 2) showed that the initial status of the sample was 70.63 ($p < .001$) and the slope was –.20 ($p < .001$). The reliability of the intercept was .61, and the reliability of the slope was .26. The variance of initial status ($\sigma^2_0 = 82.97$, $p < .001$) was significant, as was the variance of the slope ($\sigma^2_1 = 0.06$, $p < .001$). In addition, the pseudo R^2 (R^2_ε) comparing the Level 1 variances from Models 1 and 2 showed a decline of .138 (from 46.15 to 36.37); thus, approximately 21% of the within-person variation in the CBCL was associated with linear change over time. To summarize, young people entered the Dawn Project with average impairments scores in the clinical range (i.e., 70.63) and improved at a significant rate of approximately 1 point every 5 months (see Table 5). Thus, by 36 months, the average score on the CBCL had decreased to 63.43, indicating that participants had moved from the clinical range to the borderline clinical range in terms of their level of impairment.

Next, we added the predictor variables of interest to the growth model (see Table 3, Final Model). In this final model, initial status was 81.22 ($p < .001$) and its reliability was .65. Three predictor variables were associated with initial status at statistically significantly levels. First, young people referred by child welfare had CBCL scores at enrollment, on average, that were 4.77 points lower ($p < .05$) than the comparison group, youth referred by mental health. Second, for each year older a youth was at enrollment into the Dawn Project, the corresponding CBCL score was 0.47 points lower ($p < .05$). Third, African American boys had CBCL scores that, on average, were 5.64 points lower ($p < .001$) at enrollment than those of the comparison group, Caucasian boys.

In this final model, the slope was not statistically significant ($\gamma_{10} = –.25$, $p > .05$), and the reliability of the slope was .26. However, two predictor variables were associated with rates of change over time at statistically significantly levels. First, young people referred by juvenile justice showed a rate of change in their average CBCL scores over time that, on average, was 0.17 points slower ($p < .05$) than the comparison group, young people referred by mental health. Second, young people referred by education showed a rate of change in their average CBCL scores over time that, on average, was 0.20 points slower ($p < .05$) than those of the comparison group, young people referred by mental health.

A comparison of the conditional variance components of this final model with the unconditional growth model showed that the within-person variance components were quite similar. The first pseudo R^2 (R^2_0) declined from 82.97 to 72.50, suggesting that 13% of the variance in the initial status of the final model was explained by this set of predictors. The second pseudo R^2 (R^2_1) suggested that none of the variance in the slope of the final model was explained by this set of predictors. Goodness-of-fit measures for the CBCL models (see Table 3) suggested that the final model fit better than either of the baseline models.

CAFAS. Fitting the unconditional means model to the sample (see Table 4, Model 1) showed the overall grand mean of CAFAS scores was 121.20 ($p < .001$). The reliability of initial status was .70. Both variance components were statistically significant, suggesting that there was outcome variation in this model available for prediction. The interclass correlation in Model 1 across Level 1 and Level 2 ($\rho = .46$) indicated that 46% of the total outcome variation was located between individuals and 54% was within individuals.

An examination of unconditional growth model for the CAFAS (see Table 4, Model 2) showed that the initial status of the sample was 131.16 ($p < .001$) and the slope was –.88 ($p < .001$). The reliability of the intercept was .51, and the reliability of the slope was .18. The variance of initial status ($\sigma^2_0 = 1{,}340.92$, $p < .001$) was significant, as was the variance of the slope ($\sigma^2_1 = 1.15$, $p < .001$). In addition, the pseudo R^2 (R^2_ε) comparing Level 1 variances from Models 1 and 2 showed a decline of .21 (from 1,421.92 to 1,226.08); thus, approximately 14% of the within-person variation in the CAFAS was associated with linear change over time. In summary, young people entered the Dawn Project with average CAFAS scores slightly above the marked impairment range (i.e., 131.16) and improved at a statistically significant rate of approximately 1 point every 1.14 months (see Table 5). Thus, by 36 months, the average score had decreased to 99.48, indicating that participants moved from the marked impairment range into the range of moderate impairment in terms of clinical functioning levels. Moreover, changes in CAFAS scores of 20 or more points are considered clinically significant; thus, approximately 23 months after entering the Dawn Project, the average young person had demonstrated a clinically significant improvement in functioning.

Next, we added the predictor variables to the growth model (see Table 4, Final Model). In this final model, initial status was 183.58 ($p < .001$), and its reliability was .47. Three variables were associated with initial status at statistically significantly levels. First, young people referred by child welfare had CAFAS scores at

Table 4
Taxonomy of Multilevel Models of Change ($N = 305$) for the Child and Adolescent Functional Assessment Scale

Fixed Effects	Parameter	Model 1 Unconditional Growth	Model 2 Unconditional Growth	Model Final
Initial status, π_{oi}				
Intercept	γ_{00}	121.2***	131.16***	183.58***
Child welfare	γ_{01}			–26.64**
Juvenile justice	γ_{02}			–9.64
Education	γ_{03}			–.41
Age	γ_{04}			–2.23*
Caucasian female	γ_{05}			–3.46
African American male	γ_{06}			–21.90***
African American female	γ_{07}			–13.81
Rate of change, π_{1i}				
Intercept	γ_{10}		–.88***	–.84
Child welfare	γ_{11}			–.01
Juvenile justice	γ_{12}			–.47
Education	γ_{13}			–.62
Age	γ_{14}			–.001
Caucasian female	γ_{15}			.27
African American male	γ_{16}			.44
African American female	γ_{17}			.43
Variance components				
Level 1				
Within-person	σ^2_ε	1,421.92	1,226.08	1,227.92
Level 2				
In initial status	σ^2_0	1,198.12***	1,340.92***	1,142.37***
In rate of change	σ^2_1		1.15***	1.07***
Covariance	σ^2_{01}		–12.28	–8.80
Covariance correlational coefficient	p		–.31	–.24
Interclass correlation		.54		
Intercept reliability		.702	.51	.47
Slope reliability			.18	.18
Pseudo R^2 statistics and goodness of fit				
R^2_ε			.14	.14
R^2_0				.15
R^2_1				.07
Deviance		1,2657.81	1,2592.06	1,2521.71
Akaike information criterion		1,2661.81	12,600.06	12,529.71

*$p < .05$. **$p < .01$. ***$p < .001$.

enrollment that, on average, were 26.64 points lower ($p < .01$) than those of the comparison group, young people referred by mental health. Second, for each year older a child was at enrollment into the Dawn Project, her or his corresponding CAFAS score was 2.23 points lower ($p < .05$). Third, African American boys had CAFAS scores that, on average, were 21.90 points lower ($p < .001$) at enrollment than those of the comparison group, Caucasian boys. In this final model, the slope was not statistically significant ($\gamma_{10} = –.84$, $p > .05$), and the reliability of the slope was .18; nor were any of the predictor variables associated with rates of change over time statistically significant. The first pseudo R^2 (R^2_0) declined from 1,340.92 to 1,142.37, suggesting that 15% of the variance in the initial status of the final model was explained by this set of predictors. The second pseudo R^2 (R^2_1) declined from 1.15 to 1.07, which suggests that 7% of the variance in the slope of the final model was explained by this set of predictors. Finally, goodness-of-fit measures for the CAFAS models suggested that the final model fit better than either of the baseline models.

Discussion

SOCs are designed to integrate and coordinate social services in an effort to improve the clinical functioning of the children and youth who participate. To date, much of the research in this area has focused on cross-sectional examinations of the relationship between SOC involvement and clinical functioning, with little attention given to longitudinal change. The purpose of this study was to

Table 5
Average Scores by Instrument at Enrollment, 6, 12, 18, 24, 30, and 36 months

Average Scores	BERS	CBCL	CAFAS
Enrollment	89.09	70.63	131.16
6 months	89.63	69.43	125.88
12 months	90.17	68.23	120.60
18 months	90.71	67.03	115.32
24 months	91.25	65.83	110.04
30 months	91.79	64.63	104.76
36 months	92.33	63.43	99.48

Note: The tabled values are the predicted scores from the straight-line change models for the Behavioral and Emotional Rating Scale (BERS), Child Behavior Checklist (CBCL), and Child and Adolescent Functional Assessment Scale (CAFAS). BERS thresholds: scores below 90 indicate below-average strengths and 90 to 110 indicate average strengths. CBCL thresholds: Scores 60 to 63 indicate borderline clinical impairment and scores above 63 indicate clinical impairment. CAFAS thresholds: scores 140 and above indicate severe impairment, 100 to 130 marked impairment, and 50 to 90 moderate impairment.

gain a clearer understanding of the patterns of clinical change that occur over time for children and youth who participated in an established SOC. Using three well-known clinical measurement instruments, our findings suggest that, in general, young people enter the Dawn Project with below-average strengths levels and clinically significant challenges in impairment and functioning. Findings also suggest that some of the differences in clinical functioning at the time of enrollment in the SOC are associated with referral source and demographic characteristics. These results reinforce the work of other researchers who also have reported that the clinical characteristics of children entering SOCs appear to differ based on referral source and demographic traits (Epstein & Cullinan, 1995; Landrum et al., 1995; J. A. Rosenblatt & Robertson, 1998; Walrath, Sharp, Zuber, & Leaf, 2001). Also reflecting findings from other studies, we found that young people appear to benefit equally well from their involvement in the Dawn Project, with little regard to the clinical differences noted at the time of enrollment (Walrath, 2001; Walrath, Mandell, et al., 2001). Moreover, participants' average scores on each instrument (i.e., BERS, CAFAS, CBCL) crossed a clinically significant threshold at some point during the study period, suggesting that the changes observed in this study also had practical meaning. Specifically, by approximately 12 months after enrollment in the SOC, the strengths rating of the average participant on the BERS had improved from below average to average; the average impairment rating on the CBCL appeared to have crossed the threshold from clinical to borderline clinical at approximately 36 months; and the rating of functionality measured by the CAFAS also crossed the threshold from marked to moderate impairment at 36 months.

Longitudinal findings. On average, young people in the Dawn Project started with serious challenges in clinical functioning and improved across time. We were encouraged that demographic variables were not a substantive source of differences in the observed patterns of clinical change because this suggests that the Dawn Project appears to work equally well for all children who are referred. This mirrors the findings from a study by Walrath, Mandell, and Leaf (2001), who reported that although children entering SOCs were demographically heterogeneous, comparable functional improvement occurred during their first 6 months of program involvement, without regard to that heterogeneity. Similarly, our results reflect those of Manteuffel et al. (2002), who examined national data and found that children entered SOCs with serious levels of impairment and that by 2 years postenrollment, 45% of the sample demonstrated clinically significant improvements on the CBCL, with more than half of that group falling below the clinical cutoff for total problem T scores. Manteuffel and her colleagues also reported that approximately half of the sample exhibited clinically significant reductions in CAFAS scores (i.e., a score reduction of 20 or more points) between enrollment and 2 years. The results of our study extend these findings longitudinally, demonstrating that young people show steady improvement over the 36 months in which measurements were obtained, regardless of gender, age, or race. A possible exception is that African American boys appeared to gain strengths at a slower rate than other groups did. However, this finding might reflect the stronger starting points of African American boys, whose strengths scores were already near average when they entered the SOC, perhaps indicating that it is more difficult to improve as rapidly when youth enter the SOC already functioning above the average rate of new participants.

In terms of referral source, symptoms appeared to reduce faster for youth who were referred from juvenile justice and education, at least on the CBCL. Other researchers also have described children referred to SOCs as exhibiting clinical heterogeneity with regard to the referring agency (Walrath, 2001; Walrath, Mandell, et al., 2001). We suggest that future researchers should specifically examine whether young people referred to SOCs from education and juvenile justice benefit more quickly than youth entering from other systems or if more increased challenges at enrollment are creating the appearance that improvements occur more rapidly. We speculate that each agency within the various child-serving systems may have its own service continuum with different levels of quality and capability for working with youth with emotional and behavioral issues. This would account for the differences researchers observe in the clinical profiles of children referred to SOCs by different systems. For example, child welfare is a frequent initial entry point into the social services system, and children from this system tend to be younger than youth from other systems when they are referred to an SOC. Children entering the SOC from child welfare also appear to have lower levels of impairment when they enter SOCs (Walrath, dosReis, et al., 2001). The education system, on the other hand, typically does not serve children until they reach school age. Children with EBD who experience school failure are labeled to receive special education services, which may or may not include mental health services. However, children referred from education tend to exhibit higher levels of impairment than do children from child welfare (Walrath, dosReis, et al., 2001). Children referred from education also tend to be older at enrollment than those referred from child welfare and therefore further along the social services continuum than those from child welfare. Juvenile justice represents an even later point along the child–services continuum than child welfare and education because youth referred to SOCs tend to be older at the time of enrollment. Finally, young people in residential settings or who are incarcerated would be the furthest along this social services continuum.

We suggest that an important goal for SOCs will be to keep young people from moving farther along the continuum. For example, if a child enters the SOC from child welfare and has not yet been referred for special education or juvenile justice, what interventions might the SOC provide to reduce the likelihood of such referrals? The special education literature offers numerous prereferral strategies (e.g., see Friend & Bursuck, 2006). Similarly, when a child enters an SOC from education, what preventive measures can the SOC offer to reduce the likelihood of the child's entering the juvenile justice system? As Walrath (2001) pointed out, SOCs can positively alter

> the service array and trajectory for children who have previously been served in traditional public-sector agencies. If frontline SOC service providers are aware of the strengths and challenges that may accompany a child (e.g., risk factors, service history, etc.) as a function of where they have been referred, they will be better able to efficiently and effectively plan and provide individualized services upon entry into the SOC. (p. 100)

Initial status findings. There were four notable differences among participants at their time of enrollment in the SOC. First, younger children were more likely to enter the program with higher levels of clinical challenges as compared to older children. As age at enrollment increased, impairment levels decreased, as measured by both the CBCL and the CAFAS. We view this as an encouraging finding because it suggests that children with more serious needs are getting into SOC services at younger ages. Developmental research suggests that earlier and targeted interventions for young people with challenging behaviors can prevent the development of future problems (Gorman-Smith & Loeber, 2005). This finding also supports the results of another analysis using data from the Dawn Project in which children who were younger were significantly more likely to improve clinically during their first 6 months of SOC involvement. In that study, a 6-year-old entering the Dawn Project had an 82% chance of demonstrating clinical improvements during the first 6 months, as measured by the CAFAS. For a 16-year-old, the predicted probability of success dropped to 47% (Anderson et al., 2006). However, caution is urged when interpreting the meaning of these findings because much more needs to be learned about how age affects SOC participation. Still, children's and youth's developmental levels appear to play an important role in the design of individualized service coordination (Anderson & Mohr, 2003; Walrath, 2001).

The second difference we found was that Caucasian girls had substantially lower strengths ratings than their counterparts did at enrollment. Although we are uncertain what this finding means, researchers have found that boys are more likely to be referred to services than girls are and that boys also have been documented to use mental health services at twice the rate that girls do (Walrath et al., 2004). One also might question whether service providers are waiting longer to refer girls to SOCs as compared to boys with comparable needs. Moreover, researchers have found that girls with high levels of maladaptive behavior are more likely to lack strengths (Cullinan, Osborne, & Epstein, 2004). However, our finding was limited to lower levels of strengths for Caucasian girls at enrollment, and our CBCL and CAFAS data indicated that Caucasian girls did not differ in terms of clinical impairment from African American girls or Caucasian boys at enrollment. Thus, more research is needed to see if this finding can be replicated and better understood.

The third difference was that African American boys enter the SOC with more strengths and lower (but still clinical) levels of impairment than do the other subgroups. In other words, this subgroup appeared to be doing better than their counterparts at the time they enrolled in the Dawn Project. Therefore, in spite of relatively higher levels of strengths and lower levels of clinical impairment, African American boys were still being referred to an SOC, which ostensibly was created to serve young people with the most serious challenges. Although this is only speculation, we worry there are larger structural biases at work in the social services system. For example, what if African American boys with more strengths are referred to the SOC, whereas African American boys with fewer strengths are referred to the juvenile justice system more quickly than other subgroups of young people with comparable profiles? We argue that such speculation is both disturbing and warranted, particularly given the empirical evidence that African American boys experience systematic inequity in other arenas as well. In fact, African American boys are disproportionately suspended and expelled from school and for less severe infractions compared to other subgroups of children (Skiba, Michael, Nardo, & Peterson, 2002; Skiba et al., 2006). We suggest that future researchers examine referral practices in the children's social service system for gender- and race-based bias.

The final difference at enrollment in our study was that young people who enter the Dawn Project from child welfare have greater strengths and fewer symptoms and functional challenges than do children entering from other systems. As noted previously, this is similar to the findings of Walrath, dosReis, and colleagues (2001) that children entering the SOC from child welfare had less severe impairment than children entering from education, juvenile justice, and mental health. Thus, we again speculate that the child welfare system may represent an earlier entry point into the children's social services arena as compared to other systems, suggesting that young people from child welfare would benefit from services and supports that reduce the potential for future involvement with other systems such as juvenile justice. However, we also are reminded of a troubling observation put forth by Walrath, dosReis, et al., who said that that young people from non–child welfare systems may receive such poor quality mental health care in the traditional child-serving sectors that it should come as no surprise they enter SOCs with high levels of clinical impairment.

Clearly, several important limitations need to be considered when interpreting the findings of our study. The primary limitation is that we did not have a comparison group in the study, making it impossible to know what would have happened had the SOC intervention not been provided. Although the measurements taken at enrollment can provide pretest information about what might have happened had the sample not received the SOC intervention, this design is susceptible to serious threats to validity such as maturation and history (Shadish, Cook, & Campbell, 2002). As others have pointed out (e.g., Foster et al., 2007; A. Rosenblatt, 2005), we recommend that although random designs are difficult to implement when studying SOCs, quasi-experimental designs using control groups should be used when feasible. For example, several studies have compared children in SOCs to children receiving services as usual (Stephens et al., 2005). Thus, it is recommended that future researchers use comparison groups in their SOC effectiveness studies. Second, we were not able to examine the services that participants received while in the SOC, nor did we investigate the impact that specific service configurations had on child outcomes. In other analyses of the Dawn Project (Wright et al., 2004), we examined the impact of general classes of services and found few overall effects of the aggregate service categories on the clinical outcomes discussed here; however, those analyses were preliminary and based on a small sample. Therefore, we believe that with a larger sample size, it may be possible to better isolate specific types of service configurations and explore their relationships with clinical outcomes longitudinally. Finally, we did not investigate other variables that could have affected clinical change over time. For example, the degree and quality of family involvement in the SOC would be hypothesized to predict patterns of change in youth outcomes. Similarly, child and family team composition and functioning also might be important variables that could improve our ability to understand longitudinal patterns of change. Thus, we acknowledge that our analyses should be viewed as preliminary and encourage future researchers to begin examining additional, well-defined predictors of change over time in SOCs.

Despite these limitations, the findings from this study offer some important insights about the patterns of clinical change that occur longitudinally in an SOC and support a growing body of literature demonstrating the potential of SOCs to improve youth outcomes. It is encouraging that the wide-ranging differences in clinical functioning among participants at their time of enrollment did not negatively influence their progress in the SOC. We end by speculating that the fact such improvements occurred without regard to demographic or referral system differences likely reflects the Dawn Project's strict adherence to a specific set of values and principles as part of its practice (Stroul & Freidman, 1986), including cultural competence, caregiver involvement, service coordination, a focus on child and family strengths, and individualization (Anderson, Meyer, Sullivan, & Wright, 2005; Walker & Schutte, 2004). Several recent studies have suggested that the Dawn Project is successfully implementing an SOC consistent with these values and principles (see Anderson et al., 2003, 2005; Wright et al., 2006). Thus, we call for researchers to more fully examine the degree to which SOCs like the Dawn Project are improving outcomes specifically because of their ability to successfully implement SOC principles in ways that offer individually tailored services and supports that capitalize on the strengths of participating children and their families.

Note

1. Test statistic values were derived from the *t* statistic, which is really a *z* statistic because large-sample theory is assumed in the maximum likelihood context.

References

Achenbach, T. M. (1991). *Manual for the Child Behavior Checklist/4-18 and 1991 profile*. Burlington: University of Vermont Department of Psychiatry.

Anderson, J. A. (2007). *Patterns of school functioning over time among students in a system of care.* Bloomington: Indiana University Press.

Anderson, J. A., Effland, V., Kooreman, H. E., & Wright, E. R. (2006). Predicting functional improvement over time in a system of care. *Families in Society: The Journal of Contemporary Social Services, 87,* 438–446.

Anderson, J. A., Meyer, R. M., Sullivan, M. P., & Wright, E. R. (2005). Impact of a system of care on a community's children's social services system. *Journal of Child and Family Studies, 14,* 505–520.

Anderson, J. A., & Mohr, W. K. (2003). A developmental ecological perspective in systems of care for children with serious emotional disturbances and their families. *Education and Treatment of Children, 26*(1), 52–74.

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.

Barkley, R. (1988). Child Behavior Rating Scales and Checklists. In M. Rutter, A. H. Turma, & I. S. Lann (Eds.), *Assessment and diagnosis in child psychopathology* (pp. 113–155). New York: Guildford.

Behar, L. (1985). Changing patterns of state responsibility: A case study of North Carolina. *Journal of Clinical Child Psychology, 14,* 188–195.

Bickman, L. (1996). The evaluation of a children's mental health managed care demonstration. *Journal of Mental Health Administration, 23*(1), 7–16.

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,* 135–156.

Bruns, E. J. (2004). *Wraparound fidelity report for Dawn*. Seattle: Department of Psychiatry, University of Washington.

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,* 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,* 321–339.

Carney, M. M., & Buttell, F. (2003). Reducing juvenile recidivism: Evaluating the wraparound services model. *Research on Social Work Practice, 13,* 551–568.

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,* 241–261.

Connor, T., Phan, D. L., & Stephens, R. L. (2002, March). *Survival analysis of arrest data in the longitudinal comparison study*. Paper presented at System of Care for Children's Mental Health: Expanding the Research Base, University of South Florida, Tampa.

Cross, T. P., & McDonald, E. (1995). *Evaluating the outcome of children's mental health services: A guide for the use of available child and family outcome measures*. Boston: Judge Baker Children's Center.

Cullinan, D., Osborne, S., & Epstein, M. H. (2004). Characteristics of emotional disturbance among female students. *Remedial and Special Education, 25*(5), 276–290.

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,* 83–99.

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., & Cullinan, D. (1995). Personal, family, and service use characteristics of young people served by an interagency community based system of care. *Journal of Emotional and Behavioral Disorders, 3,* 55–65.

Epstein, M. H., Cullinan, D., Harniss, M. K., & Ryser, G. (1999). The Scale for Assessing Emotional Disturbance: Test-retest and interrater reliability. *Behavior Disorders*, *24*, 220-230.

Epstein, M. H., Cullinan, D., Quinn, K. P., & Cumblad, C. (1994). Characteristics of children with emotional and behavioral disorders in community based programs designed to prevent placement in residential facilities. *Journal of Emotional and Behavioral Disorders, 2,* 51–57.

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,* 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,* 208–216.

Epstein, M. H., & Sharma, J. (1998). *Behavioral and Emotional Rating Scale: A strength-based approach to assessment.* Austin, TX: Pro-Ed.

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,* 55–65.

Farmer, E. M. Z. (2000). Issues confronting effective services in systems of care. *Children and Youth Services Review, 22,* 627–650.

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,* 859–865.

Foster, E. M., Stephens, R., Krivelyova, A., & Gamfi, P. (2007). Can system integration improve mental health outcomes for children and youth? *Children and Youth Services Review, 29,* 1301–1319.

Friend, M., & Bursuck, W. (2006). *Including students with special needs: A practical guide for classroom teachers* (4th ed.). Boston: Allyn & Bacon.

Gibbons, R. D., Hedeker, D., Elkin, I., Waternaux, C., Kraemer, H. C., Greenhouse, J. B., et al. (1993). Some conceptual and statistical issues in the analysis of longitudinal psychiatric data. *Archives of General Psychiatry, 50,* 739–750.

Gorman-Smith, D., & Loeber, R. (2005). Are developmental pathways in disruptive behavior behaviors the same for girls and boys? *Journal of Child and Family Studies, 14,* 15–27.

Handron, D. S., Dosser, D. A., Jr., McCammon, S. L., & Powell, J. Y. (1998). Wraparound: The wave of the future: Theoretical and professional practice implications for children and families with complex needs. *Journal of Family Nursing, 4*(1), 65–87.

Harniss, M. K., Epstein, M. H., Ryser, G., & Pearson, N. (1999). The behavioral and emotional rating scale: Convergent validity. *Journal of Psychoeducational Assessment, 17*(1), 4–14.

Hernandez, M., & Hodges, S. (2003). Building upon the theory of change for systems of care. *Journal of Emotional and Behavioral Disorders, 11,* 19–26.

Hodges, K. (1994). *The Child and Adolescent Functional Assessment Scale*. Ypsilanti: Eastern Michigan University, Department of Psychology.

Hodges, K., Doucette-Gates, A., & Liao, Q. (1999). The relationship between the Child and Adolescent Functional Assessment Scale (CAFAS) and indicators of functioning. *Journal of Child and Family Studies, 8,* 109–122.

Hodges, K., Lambert, W., & Summerfelt, W. T. (1994, March). *Validity of a measure to assess impairment: The Child and Adolescent Functional Assessment Scale (CAFAS)*. Paper presented at the 7th Annual Research Conference, A System of Care for Children's Mental Health: Expanding the Research Base, University of South Florida, Tampa.

Hodges, K., & Wong, M. W. (1996). Psychometric characteristics of a multidimensional measure to assess impairment: The Child and Adolescent Functional Assessment Scale. *Journal of Child and Family Studies, 5,* 445–467.

Holden, E. W., Connor, T., O'Connell, S. R., Blau, G., Long, D., Hoff, D., et al. (2002, March). *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, University of South Florida, Tampa.

Huz, S., McNulty, T. L., & Evans, M. E. (2000, March). *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, University of South Florida, Tampa.

Hyde, K., Burchard, J. D., & Woodworth, K. (1996). Wrapping services in an urban setting. *Journal of Child and Family Studies, 5,* 67–82.

Joyner, J. I. (1992, March). *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, University of South Florida, Tampa.

Knapp, M. S. (1995). How shall we study comprehensive, collaborative services for children and families? *Educational Research, 24,* 5–16.

Knitzer, J. (1982). *Unclaimed children: The failure of public responsibility to children and adolescents in needs of mental health services*. Washington, DC: Children's Defense Fund.

Kutash, K., Duchnowski, A. J., & Friedman, R. M. (2005). The system of care 20 years later. In M. H. Epstein, K. Kutask, & A. J. Duchnowski (Eds.), *Outcomes for children and youth with emotional and behavioral disorders and their families: Programs and evaluation best practice* (2nd ed., pp. 3–22). Austin, TX: Pro-Ed.

Landrum, T. J., Singh, N. N., Nemil, M. S., Ellis, C. R., & Best, A. M. (1995). Characteristics of children and adolescents with serious emotional disturbance in systems of care: Part II: Community based services. *Journal of Emotional and Behavioral Disorders, 3,* 141–150.

Lyons, J. S. (2004). *Redressing the emperor: Improving our children's public mental health system*. Westport, CT: Praeger.

Manteuffel, B., Stephens, R. L., & Santiago, R. (2002). Overview of the national evaluation of the comprehensive community mental health services for children and their families program and summary of current findings. *Children's Services: Social Policy, Research, and Practice, 5*(1), 3–20.

McConaughy, S. H. (1993). Advances in empirically based assessment of children's behavioral and emotional problems. *School Psychology Review, 22,* 184–192.

Morgan, C. J., Cauce, A. M., Wagner, V., & Moore, E. (2000, March). *Effectiveness of intensive case management for homeless adolescents after twelve months*. Paper presented at the System of Care for Children's Mental Health: Expanding the Research Base, University of South Florida, Tampa.

Namir, S., & Weinstein, R. S. (1982). Children: Facilitating new directions. In L. R. Snowden (Ed.), *Reaching the underserved: Mental health needs of neglected populations* (Vol. 3, pp. 43–73). Beverly Hills, CA: Sage.

Phan, D. L., & Bell, Q. (2002, March). *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, University of South Florida, Tampa.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks, CA: Sage.

Robbins, V., & Collins, K. (2002, March). *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, University of South Florida, Tampa.

Rosenblatt, A. (2005). Assessing the child and family outcomes of systems of care for youth with serious emotional disturbance. In M. H. Epstein, K. Kutask, & A. J. Duchnowski (Eds.), *Outcomes for children and youth with emotional and behavioral disorders and their families: Programs and evaluation best practice* (2nd ed., pp. 143–173). Austin, TX: Pro-Ed.

Rosenblatt, A., & Rosenblatt, J. (2000). Demographic, clinical, and functional characteristics of youth enrolled in six California systems of care. *Journal of Child and Family Studies, 9,* 51–66.

Rosenblatt, J. A., & Robertson, L. (1998). Troubled or troubling? Characteristics of youth referred to a system of care without system level referral constraints. *Journal of Emotional and Behavioral Disorders, 6,* 42–54.

Shadish, W. R., Cook, T. D., & Campbell, D.T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. New York: Houghton Mifflin.

Shore, M. F., & Mannino, F. V. (1976). Mental health services for children and youth: 1776–1976. *Journal of Clinical Child Psychology, 5,* 21–25.

Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. New York: Oxford University Press.

Singh, N. N., Landrum, T. J., Donatelli, L. S., Hampton, C., & Ellis, C. R. (1994). Characteristics of children and adolescents with serious emotional disturbance in systems of care: Part I. Partial hospitalization and inpatient psychiatric services. *Journal of Emotional and Behavioral Disorders, 2,* 13–20.

Skiba, R. J., Michael, R. S., Nardo, A. C., & Peterson, R. (2002). The color of discipline: Sources of racial and gender disproportionality in school punishment. *Urban Review, 34,* 317–342.

Skiba, R. J., Simmons, A., Ritter, S., Kohler, K., Henderson, M., & Wu, T. (2006). The context of minority disproportionality: Practitioner perspectives on special education referral. *Teachers College Record, 108,* 1424–1459.

Stephens, R. L., Connor, T., Nguyen, H., Holden, E. W., Greenbaum, P., & Foster, E. M. (2005). The longitudinal comparison study of the national evaluation of the Comprehensive Community Mental Health Services for Children and Their Families Program. In M. H. Epstein, K. Kutask, & A. J. Duchnowski (Eds.), *Outcomes for children and youth with emotional and behavioral disorders and their families: Programs and evaluation best practice* (2nd ed., pp. 525–550). Austin, TX: Pro-Ed.

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,* 179–191.

Stephens, R. L., Phan, D. L., & Greenbaum, P. E. (2003, March). *General growth mixture modeling (GGMM) of alcohol use patterns in the longitudinal comparison study*. Paper presented at the 16th Annual Research Conference, A System of Care for Children's Mental Health: Expanding the Research Base, University of South Florida, Tampa.

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.

Walker, J. S., & Schutte, K. M. (2004). Practice and process in wraparound teamwork. *Journal of Emotional and Behavioral Disorders, 12,* 182–192.

Walrath, C., dosReis, S., Miech, R., Liao, Q., Holden, E. W., De Carolis, G., et al. (2001). Referral source differences in functional impairment levels for children served in the comprehensive community mental health services for children and their families program. *Journal of Child and Family Studies, 10,* 385–397.

Walrath, C., & Liao, Q. (2005). The clinical and psychosocial characteristics of children with serious emotional disturbance entering system of care services. In M. H. Epstein, K. Kutask, & A. J. Duchnowski (Eds.), *Outcomes for children and youth with emotional and behavioral disorders and their families: Programs and evaluation best practice* (2nd ed., pp. 45–67). Austin, TX: Pro-Ed.

Walrath, C., Petras, H., Mandeli, D. S., Stephens, R. L., Holden, E. W., & Leaf, P. J. (2004). Gender differences in patterns of risk factors among children receiving mental health services: Latent class analyses. *Journal of Behavioral Health Services and Research, 31*(3), 297–311.

Walrath, C. M. (2001). Serving children with SED in urban systems of care: Referral agency differences in child characteristics in Baltimore and the Bronx. *Journal of Emotional and Behavioral Disorders, 9,* 94–106.

Walrath, C. M., Mandell, D. S., & Leaf, P. J. (2001). Responses of children with different intake profiles to mental health treatment. *Psychiatric Services, 52,* 196–201.

Walrath, C. M., Sharp, M. J., Zuber, M., & Leaf, P. J. (2001). Serving children with SED in urban systems of care: Referral agency differences in child characteristics in Baltimore and the Bronx. *Journal of Emotional and Behavioral Disorders, 9,* 94–105.

Wright, E. R., Kooreman, H. E., & Anderson, J. A. (2004, February–March). *Service utilization, expenditures, and success in the Dawn Project*. Paper presented at the 17th Annual Research Conference, A System of Care for Children's Mental Health: Expanding the Research Base, University of South Florida, Tampa.

Wright, E. R., Russell, L. A., Anderson, J. A., Kooreman, H. E., & Wright, D. E. (2006). The impact of team structure and roles on achieving treatment goals in a system of care. *Journal of Emotional and Behavioral Disorders, 14,* 240–250.

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,* 23–39.

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