PREDICTING DIFFERENTIAL OUTCOMES FOR YOUTH RECEIVING INTENSIVE CASE MANAGEMENT SERVICES IN COMMUNITY MENTAL HEALTH SETTINGS

By

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To my husband and sons who always keep life in perspective for me.

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CHAPTER I

INTRODUCTION

Purpose of the Current Study

Until recently, most research conducted in real-world publicly-funded settings has centered on access, utilization, and financing of care (Hutchinson & Foster, 2003). Little is known about quality of care and outcomes for children covered by Medicaid (Hutchinson & Foster, 2003). As a consequence, practice-as-usual in community mental health settings is not well understood. This is key because Medicaid is the largest funder of mental health services for children (Howell, 2004). For example, in 2004, Tennessee's expanded Medicaid program insured 45% of the state's youth under 21 years of age (TCCY, 2005).

Over the past few decades, mental health services research has gradually changed focus. Researchers have shifted away from broad, system-level influences to more often consider narrower, proximal service issues (Brannon, 2003). The findings from several major research demonstration projects have prompted researchers to suggest that system-level changes alone do not result in improved outcomes for children and their families (e.g., Bickman, Heflinger, Lambert, & Summerfelt, 1996; Bickman, Noser, & Summerfelt, 1999; Brannon, 2003; Hohmann, 1999; Stephens, Holden, & Hernandez. 2004).

Researchers now assert that within systems of care, effective services, based on solid theories of development and change, actually must be provided (e.g., Bickman et al., 1996; Bickman et al., 1999; Farmer, Dorsey, & Mustillo, 2004). That is, therapy and specific intervention models must work to improve outcomes. But, evidence is growing that calls into question the real-world effectiveness of therapies previously considered efficacious in controlled-settings (e.g., Weisz, Doeneberg, Han, & Weiss, 1995). Thus, it is clear that practice-as-usual settings differ from research settings in ways that present serious barriers to realizing effective services for children and their families.

The Substance Abuse and Mental Health Services Administration (SAMHSA) has heavily promoted its agenda of "Science to Service" and its compliment, "Service to Science." These themes accentuate the critical issues related to the transportability, dissemination, and diffusion of evidence-based practices (EBPs). But they also underscore the need for improved multidisciplinary collaboration and timely, real-world evaluation and quality improvement. Service delivery, quality improvement, and evaluation must be more closely aligned.

Increasingly, researchers are focusing on methods to enhance the transportability, dissemination, and implementation of EBPs (e.g., Bickman, Lambert, & Andrade, 2005; Choripita, Daleiden, & Weisz, 2005; Hoagwood & Burns, 2005; Kazdin, 2004; Lambert, 2005; Sapyta, Riemer, & Bickman, 2005; Schoenwald, Sheldow, Letourneau, & Liao, 2003). They seek to enhance "clinical validity" (Weisz, Hawley, & Doss, 2004, p. 800). Bickman and colleagues (Bickman et al., 2004) asserted that therapeutic alliance, although acknowledged to be important, has not received the necessary research attention in children's mental health services. Other researchers, in attempts to successfully implement EBPs, have emphasized the role of contextual factors such as practice-level characteristics, program fidelity, and organizational climate and culture (e.g., U.S.

DHHS, 199; Hoagwood & Burns, 2005; Glisson & Hemmelgarn, 1998; Glisson & James, 2002; Stephens et al., 2004). Jensen, Weersing, Hoagwood, and Goldman (2005) asserted that researchers more often should consider nonspecific aspects of treatment such as attention, alliance, dose, service intensity, and mediators of change.

Given the scarcity of public resources, quality improvement and evaluation initiatives to improve the quality of care are critical. For example, states' behavioral health contracts with managed care companies increasingly demand performance measurement and quality of care studies (Hendryx, Beigal, & Doucette, 2001). Recently, the Institute of Medicine (2005), as well as Senator Bill Frist (2005) recommended federal efforts to develop a universal, standardized set of performance measures.

Tennessee's contract with Magellan Health Services (locally known as AdvoCare of Tennessee) to manage publicly-funded behavioral health services has numerous requirements for performance measures and quality of care quality improvement initiatives. A recent technical assistance report for the Partners Program funded by the Center for Healthcare Strategies (Doughtery & Boughtin, 2002) highlighted the need for quality studies on high-need populations and emphasis on outcomes monitoring and quality improvement initiatives.

Relationship of AdvoCare's QIA to this Study

Overview

This study relied on a secondary analysis of data from a Quality Improvement Activity (QIA) conducted by AdvoCare of Tennessee. The dataset included information on 462 youth and their families who received intensive case management services (described in Chapter 4). The primary goals of AdvoCare's QIA were to provide quality improvement opportunities for service delivery teams housed within Community Mental Health Agencies (CHMAs) and describe outcomes for youth participating in services and their families.

Research Questions

Whereas the focus of AdvoCare's QIA was on quality improvement, this study delved deeper into the relationships between potential predictor variables and youth outcomes. The project was guided by a theory-driven conceptual model (see Chapter 3). The overarching goal of the study was to explore the relationship between youth, family, and service characteristics and the differential clinical outcomes experienced by youth who participated in CTT services. More specifically, the study addressed the following theory-driven questions:

- Do youth and family predisposing and enabling factors predict outcome?
- Are youth outcomes worse for youth who have experienced a greater pile-up of stressors?
- Do positive parent perceptions, specifically caregiver strain and parent hopefulness, relate to better youth outcomes?
- Are characteristics of service delivery related to youth outcomes?
- Are youth outcomes moderated by their caregivers' active involvement in managing their children's mental illnesses?

In order to address these specific aims, the study explored the clinical outcomes observed for high-risk youth who participated in practice-as-usual community-based services. In addition, multi-level models predicting youth outcomes were evaluated for each specific aim.

Implications

Assessing the impact of missing data from a real-world dataset is critically important in assessing the generalizability and reliability of the findings. More broadly, it is important to consider whether data from uncontrolled, practice-as-usual quality improvement studies are useful for exploring issues related to quality of care. Child and adolescent mental health services research can simply not provide hard evidence about practices in all settings (Hoagwood, Burns, Kiser, Ringeisen, & Schoenwald, 2001). Given the diverse youth and family populations served in real-world behavioral health settings, this study explored differential youth mental health outcomes to suggest programmatic improvements.

CHAPTER II

LITERATURE REVIEW

This chapter reviews several bodies of relevant literature. First, services for youth with serious emotional disorders are considered, specifically models of intensive case management. Next, factors related to the mental health outcomes are explored. Chapter 3 expands this discussion by focusing on the conceptual models that serve as the foundation for the present study.

Service Needs of Youth with Serious Emotional Disorder

Recent estimates suggest that 20% of youth suffer from mental illness and that half of those, or 10% of the youth population, suffers more serious impairment (U.S. DHHS, 1999; U.S. Public Health Service, 2000). Some estimates of SED are somewhat lower, ranging from 4-8% (e.g., Costello, Angold, Burns, Stangl, Tweed, Erlanli, & Worthman, 1996; Costello, Messer, Bird, Cohen, & Reinherz, 1998).

Youth with SED demonstrate significant functional impairment in everyday settings and often require services that span several agencies, at varying levels of intensity, over extended periods of time. The behavioral and emotional problems of children have serious consequences including suicide, school failure, substance abuse, family problems, teen pregnancy, delinquency, and violence. Services for children and their families are often fragmented and uncoordinated (Pires & Stroul, 1996). Not only must families deal with their children’s symptoms, but they often experience additional burdens while accessing and navigating a plethora of mental health and support services that are fragmented and fraught with barriers (Burns, Costello, Angold, Tweed, Stangl, et al., 1995; Knitzer & Olson, 1982). Moreover, in the past decade, inpatient hospitalization and out-of-home placements for youth have risen (e.g., Pottick, Warner, Isaacs, Henderson, Milazzo-Sayre, & Manderscheid, 2004). This is consistent with utilization patterns in Tennessee, and one of the reasons that many states have seen an exponential rise in managed care.

Various community-based case management models have emerged to enhance coordination of the complex needs of youth with SED. Much of this growth has occurred to address quality of care, , improve outcomes, and , control costs (Illbeck & Kerby, 1995). In addition, community-based and intensive in-home services highlight the importance of incorporating an ecological framework within services design (Farmer et al., 2004). The next section reviews case management models of service delivery that target youth with SED and their families.

Case Management Models

Overview

This review includes services characterized by Farmer et al. (2004) as multi-sector coordination and integration services that are promising or evidence-based. Although Farmer et al. (2004) classified multisystemic therapy (MST) as a multimodal treatment, it is reviewed briefly. While there are key differences between the case management approaches and MST, the intensive community-based service has received much research attention. This review does not address specific therapies (e.g., functional family therapy, cognitive behavior therapy, etc.) or services delivered to youth in out-of-home placements (e.g., therapeutic foster care). Finally, research, theory, and knowledge related to children's mental health services have lagged far behind that in the adult field (Nixon, Northrup, Summerfelt, & Bickman, 2000). Thus, the review does include some citations and information relative to services for adults.

Defining Case Management

Case management has been defined and conceptualized in a plethora of ways. Solomon (1992) defined case management as "a coordinated strategy on behalf of clients to obtain the services that they need, when they need them, and for as long as they need these services" (p. 164). He specified four types of case management: assertive community treatment, strengths case management, rehabilitation, and generalist case management. Mueser and colleagues (e.g., Meuser, Bond, Drake, Resnick, 1998) included six types: broker, clinical, strengths, and rehabilitation case management as well as assertive community treatment and intensive case management. Case management models range from generalist, brokerage models, in which the goal is simply to monitor or direct service flow, to intensive clinical care models, in which clinicians, as case managers, deliver services directly to their clients. The latter models tend to expand or enhance traditional office-based mental health services and to provide a broad range of support services.

Although most case management models highlight individual case managers who work with consumers, team-based models have become popular. The distinction between assertive community treatment (ACT) and other types of case management is common and relates to several of ACT's distinguishing characteristics (Marshall & Lockwood, 1998). ACT serves adults with severe and persistent mental illness (SPMI). It is one of the most researched models of intensive case management. ACT is a team-based model in which all services are self-contained including psychiatry, nursing, case management, vocational, daily living skills coaching, peer mentoring, crisis, and substance abuse treatment. Caseloads are shared, services are delivered 24/7, and team meetings are conducted daily. Assertive engagement techniques are employed, and services are unconditional. The National Alliance for the Mentally Ill (NAMI) has vigorously promoted dissemination of the model as well the importance of fidelity. By 2001, the majority of states (41) had implemented ACT teams, many statewide (NASMHPD Research Institute, 2002).

For youth, much of the growth of case management was stimulated by the Child and Adolescent Service System Program (CASSP) and subsequent federally-supported system of care demonstrations (Stroul & Friedman, 1986; Lourie, 2003). The Surgeon General's Mental Health Report reiterated the call for case management for youth with SED (U.S. DHHS, 1999). That impetus was further buttressed by a follow-up report that defined research, practice, and policy for children's mental health services (U.S. DHHS, 2000). Funding from several prominent foundations, including the Robert Wood Johnson and Annie E. Casey Foundations, and state-funded demonstrations added further leverage (Lourie, 2003).

Many of the approaches integrate case management and therapy in models similar to ACT, but with consideration given to the developmental and contextual differences faced by children and adolescents. These approaches, referred to as integrated community-based treatment by Hoagwood and colleagues (e.g., Hoagwood et al., 2001), include intensive case management, MST, and wraparound. Commonly, the approaches are strength-based and individualized while promoting service coordination and continuity of care. Consequently, they are consistent with the values promoted by CASSP (Burchard, Bruns, & Burchard, 2002). The braiding of case management and therapy, however, makes the approaches difficult to categorize.

Intensive Case Management

"Intensive case management," "individualized service planning," "child and family teams," and "wraparound" are terms that have been applied to individualized, multidimensional approaches to concurrent therapy and service coordination for youth with SED (Faw, 1999; Walker, Koroloff, & Schutte, 2003). According to Farmer et al. (2004), case management models focus on facilitating access and coordinating services. Therapy, per se, is not the central focus of services; although, it may be included.

The distinctions between various implementations of case management, intensive case management, and wraparound are quite blurred. In fact, in some instances, it appears an issue of semantics (Burns, Hoagwood, & Mrazek, 1999). Most service models intend to access, mobilize, coordinate, and maintain an individual array of services for the youth and their families (Stroul, 1995). Most of the intensive case management models include a specific component that emphasizes assessment and service planning. Advocacy and evaluation are frequent elements.

In general, research on community-based services for children is very limited (Farmer et al., 2004). As mentioned, research related to case management for children lags behind that for adults (Illbeck & Kerby, 1995). However, the limited research does suggest that intensive case management for children is effective in achieving some positive outcomes for youth (e.g., Farmer et al., 2004; Evans, Armstrong, Kuppinger, Huz, & Johnson, 1998; Hoagwood et al., 2001). In a review, Farmer et al (2004) described case management as "promising or potentially efficacious" (p. 867).

To date, there have been few studies using randomization or quasi-experimental designs to study intensive case management. In one randomized control study of the use of case managers within a treatment team, Burns, Farmer, Angold, Costello, and Behar (1996) found that the model contributed to fewer days of inpatient hospitalization, longer engagement in services, and a broader use of community-based services. Another controlled trial conducted by Evans and her colleagues (Evans et al., 1998) demonstrated that youth participating in intensive case management experienced fewer out-of-home placements and inpatient hospitalizations. They found decreased symptoms and impairment in youth served with intensive case management, particularly fewer externalizing and social problems.

Another study (Evans, Boothroyd, Armstrong, Greenbaum, Brown, & Kuppinger, 2003) examined the outcomes of youth randomly assigned to one of three crisis interventions. Two interventions were modeled after a family preservation model, with one of those adding an enhancement focused on cultural competence. The third condition was termed crisis case management, but did not include all elements of intensive case management that the researchers had previously studied. Youth in all conditions showed improvement over time. Youth in the crisis case management condition demonstrated greater declines in externalizing symptoms; yet, families in the other conditions showed better gains in family functioning.

At a systems level, Kentucky implemented a statewide effort to be serve youth with SED called the Interagency Mobilization for Progress in Adolescent and Child Treatment (IMPACT). The case management model called for a service coordination function through creating multidisciplinary teams for youth, developing a common plan, monitoring and evaluating implementation of the plan, coordinating within and across agencies, and revising the plan as appropriate. Although preliminary findings suggested positive outcomes for youth and families, Illbeck and Kerby (1995) pointed out issues needing further exploration such as the impact of the organizational context on outcomes. They emphasized the paradigm shift required by service coordinators that may conflict with more traditional organizational structures. This is consistent with the arguments posited by Glisson and his colleagues (1998; 2002) that organizational culture impacts the adoption and implementation of services (reviewed later in this chapter).

Wraparound

Wraparound is an individualized approach to service delivery that is guided by a core set of elements and practice principles (Burchard et al., 2002; Burns & Goldman, 1999). It embodies the principles of CASSP as a community-based, strength-oriented, child- and family-centered, individualized, and culturally competent approach (Behan & Blodgett, 2003; Stroul, 2002). Wraparound is not a strict, dictated approach. It has been described as a practice rather than as a model. However, the principles have only been operationalized in detail by a few sites and trainers (e.g., Rast & VanDenBerg, 2003). Although the term "wraparound" has been used for over 20 years, there has been no consensus or organized effort to define its essential elements until just recently (Bruns, Burchard, Sutter, Leverentz-Brady, & Force, 2004). Although the flexibility of wraparound is a strength, it also has been a barrier to researching the effectiveness of wraparound service delivery (Bruns et al., 2004). Table 1 displays the consensus on the core elements of wraparound (Burns & Goldman, 1999):

Table 1

Ten Essential Elements of Wraparound

Element	Description
1	Wraparound services and supports must be based in the community.
2	Services and supports must be individualized, strength-based, and meet the needs of children and families across multiple life domains.
3	The process must be culturally competent and built on the unique values, strengths, and social and racial make-up of the families.
4	Families must be treated as full and active partners in every level of the wraparound process.
5	The wraparound approach must be a team-driven process involving the family, child, natural supports, and community service agencies working together to develop, implement, and evaluate the individualized plan of care.
6	Wraparound agencies implementing the services must have access to flexible, noncategorized funding.
7	Wraparound plans must include a balance of formal and informal supports.
8	Community agencies and teams must provide services on an unconditional basis.
9	A service/support plan should be developed and implemented based on an interagency basis.
10	For each goal established, outcomes must be determined and measured for child and family at every level of service.

Evaluation of wraparound is further behind that of intensive case management. Thus far, evaluation of wraparound includes primarily case studies and several uncontrolled pre-post studies. Only a handful of quasi-experimental and experimental studies have been conducted. In their review, Farmer et al. (2004) stated that "the evidence base for wraparound seems to fall on the weak side of 'promising'."

Hyde, Burchard, and Woodworth (1996) asserted that early studies suggested the effectiveness of wraparound in improving youth functioning and specifically school attendance. Clark and colleagues (Clark, Prange, Lee, Stewart, McDonald, & Boyd, 1998) claimed that their evaluation of wraparound for youth in foster care showed improvement in youth externalizing problems and that youth served with "wraparound" had fewer absences from school. Yet, their evidence is inconclusive as there were many insignificant findings (Bickman, Smith, Lambert, & Andrade, 2003). Recently, Pullman, Kerbs, Koroloff, Veach-White, Gaylor and Sieler (2006) demonstrated that youth in a wraparound program for juvenile offenders had lower rates of recidivism.

In an evaluation of a congressionally mandated wraparound demonstration for the Department of Defense, Bickman et al. (2003) found that both wraparound and treat-as-usual groups improved on some measures, but that there was no differences between the two groups on measures of symptoms, functioning, and life satisfaction. However, the demonstration applied fairly restrictive exclusionary criteria, resulting in a sample that was not representative of publicly-funded populations. For example, high proportions of youth served by AdvoCare's CTT services have comorbid substance use/abuse issues, have a wide range of mental functioning, and have a history of abuse. Yet, many youth with these characteristics were excluded from the wraparound demonstration. Moreover, it is not clear, whether the services evaluated represented wraparound as characterized by experts in the field (Burns & Goldman, 1999). The division of activities between Care Managers and Case Managers in the demonstration is not typical of wraparound in which case managers, functioning within the treatment team, (including youth and family) have the responsibility of developing individualized service plans for youth and their families.

Also, the extent to which services were team-driven, culturally competent, and family- and youth-driven was not determined in the evaluation. These likely are critical components in wraparound based on evidence from ACT and other research (e.g., Garcia & Weisz, 2002). Walker and colleagues (e.g., Walker et al., 2003; Walker & Schutte, 2005) have posited that team-work and the quality of treatment planning is essential for the effectiveness of wraparound. Several have argued that **the way services are delivered** may be the most important predictors of youth and family outcomes (e.g., Hoagwood et al., 2001).

Recently, Bruns, Suter, Force, and (Burchard (2005) investigated the relationship between fidelity to the principles of wraparound and youth outcomes. They found that higher fidelity was associated with greater parent-reported satisfaction and youth improvement. Conversely, Ogles and his colleagues (Ogles, Carlston, Hatfield, Melendez, Dowell, & Fields, 2006) found no relationship between adherence to wraparound principles and youth outcomes but did suggest a potential ceiling effect due to uniformly high perceptions of adherence.

Bruns et al. (2005) noted that difficulty operationalizing “wraparound” and the multitude of ways it has been implemented are key barriers in evaluation of wraparound. Farmer et al. (2004) noted that many of the studies of wraparound have employed weak study designs. Although wraparound may be promising, it appears that greater specification of its elements and active ingredients is needed. Although the model specifically aims to be flexible and individualized, some “manualization” of the model may be required to establish effectiveness.

Multisystemic Therapy

Multisystemic therapy (MST) is a home-based, multidimensional, intensive, short-term treatment model that targets youth with problems in multiple domains. Earlier implementations of MST typically targeted youth in the juvenile justice system. Of late, there have been efforts to expand the model to serve youth with mental health and substance abuse issues (Henggeler, 1999). MST encompasses a risk and protector factor framework (Behan & Blodgett, 2003) and draws heavily on a broad ecological view that youth are intertwined within their family, school, and community settings (Farmer et al., 2004; Hoagwood et al, 2001). MST incorporates several evidence-based treatment strategies, including functional family therapy and cognitive-behavioral therapy. Although MST is purported to be individualized, it is highly manualized. The developers have placed considerable emphasis on program fidelity.

The strongest evidence of effectiveness of integrated treatment for youth with SED comes from evaluation of MST (Hoagwood et al., 2001). MST has been more rigorously evaluated than either intensive case management or wraparound, as researchers have conducted roughly a dozen controlled trials of MST. Their findings have demonstrated the effectiveness of the model in reducing arrests, out-of-home placements, and substance use/abuse (e.g., Bourdin, Mann, Cone, Henggeler, Fucci, Blaske, et al.

1995; Henggeler, Pickrel, & Brondino, 2000). The trials have shown increases in family functioning and school attendance (e.g., Henggeler et al., 1999; Henggeler et al., 2003; Schoenwald, Wald, Henggler, & Rowland, 2000). One study of youth outcomes following psychiatric crisis found that youth assigned to MST demonstrated decreased symptom severity, fewer out-of-home placements, increased school attendance, and improved family structure relative to youth assigned to hospitalization (Henggeler et al., 2003). However, the gains dissipated over time and by 12 months after the crisis, youth outcomes were essentially equivalent across the two groups. Finally, a randomized trial of MST in Hawaii demonstrated short-term gains for youth with SED participating in MST as opposed to care-as-usual (Rowland, Halliday-Boykins, Henggeler, Cunningham, Lee, Kruesi, & Shapiro, 2005). Six-months after intake, youth in MST reported decreased symptoms and caregivers reported increased social support although the change was not statistically significant. Data also indicated that youth in MST had fewer days in out-of-home placement.

There are several caveats to the current evidence base of MST effectiveness. It is not clear that the model is equally effective with all youth populations (Farmer et al., 2004). The stability of outcomes for youth with SED has not been established. Moreover, the evidence base could be strengthened by research of the model by those other than the model's developers. The vast majority of the research on MST has been conducted in fairly controlled settings. In fact, a recent meta-analysis found that there were sizeable differences in effect sizes between efficacy studies of MST using graduate students as therapists ($\underline{d}$ = .81) compared to effectiveness studies using community therapists (d = .26) (Curtis, Ronan, & Bourdin, 2004). More recent attention to the transportability of MST (e.g., Schoenwald et al., 2003) may address these problems.

Summary

In summary, the evidence in child and adolescent services suggests that intensive, integrated case management services can improve child outcomes. However, as of yet, not much is known about the impact of these services within the broader family context. Little research has been able to pinpoint the most crucial components or aspects of these programs in order to more effectively target quality improvement activities and resources. Finally, just because a practice is designated as "evidence-based" and has established effectiveness in real-world settings, does not mean that it works equally well for youth and their families across diverse communities. Many factors produce a complex web of infinite interactions, barriers, and facilitators. This is a major reason why the integration of measurement and feedback with service delivery is needed.

Factors Related to the Mental Health Outcomes

Rationale

Research aimed at investigating what works best for whom under what circumstances is a valid and reasonable pursuit. In order to address this goal, researchers have to be able to connect structure, process, and outcomes variables (for further discussion, please refer to Chapter 3). Given answers, though, providers could better target interventions to youth and their families. Additional supports could be anticipated in advance for youth and their families who are at greater risk. Information about poor outcomes can stimulate quality improvement initiatives. Interventions could address key mechanisms of change, potentially improving outcomes. At a systems level, resources could be allocated more easily and efficiently.

Moreover, because performance measurement has grown exponentially in everyday behavioral healthcare settings, knowledge of the connections between structure and outcome is needed. Differences in outcomes are not explained solely by treatment (Phillips, Kramer, Compton, Burns, & Robbins, 2003). Reports cards, provider profiling, and other methodologies need to be valid and fair if they are used. Researchers have argued that comparisons across providers, insured populations, and treatment groups (i.e., treatment versus control) require researchers to account for differences in consumer or population characteristics that may negatively impact outcomes (e.g., Banks, Paniani, & Bramley, 2001; Harman, Cuffel, & Kelleher, 2004; Hendryx et al., 2001; Phillips et al., 2003).

Looking for Predictors of Clinical Outcome

Historically, exploration of predictors has been associated with service utilization and the presence or nature of psychopathology. Development of risk-adjusted payment strategies has also received considerable attention, particularly as related to reimbursement strategies in managed healthcare (e.g., Dunn, 2001; Ettner, Frank, McGuire, & Hermann, 2001; Kuhlthau, Ferris, Davis, Perrin, & Iezzoni, 2005). However, little is known regarding predictors of psychiatry stability or change over time or (Visser, van der Ende, Koot, & Verhulst, 2003). Moreover, knowledge about the specific treatment characteristics that predict outcome in community-based settings is sparse.

Although common in health care, there is no standard method or approach to risk adjustment in behavioral health (Hendryx & Teague, 2001). Typically, patient demographics and characteristics that are beyond the control of the provider are used. These often include age, severity at intake, and race, among other variables. In order to enable across-provider comparisons, the developers of the Adolescent Treatment Outcomes Module (Robbins et al., 2001) sought to identify factors that predict differential outcomes. They assembled a panel of “experts” who proposed twelve factors grouped in three broad categories. The first category captured youth demographics and presenting problems (e.g., age, race, gender, diagnostic category). The second category included youth clinical status at intake and the impact on the family (i.e., baseline measures of symptoms and functioning, caregiver strain). The third category included parent reports of youth and family history and environment (e.g., special education, abuse, parent history of mental illness and/or substance abuse, family income, family functioning).

Robbins et al. (2001) found that the correlations between the predictors and outcomes were generally weak, but in the expected direction. Youth functioning at school and at home and family burden were the strongest predictors of poor outcomes. Hendryx and Teague (2001) included a broader array of measures in a comparison of methodologies. They found that including consumer survey and case manager ratings -- rather than relying on administrative data alone -- resulted in significant improvements to risk-adjustment models. Similarly, Phillips et al. (2003) examined the contributions of administrative and clinical data as well as information about family history and environment. In contrast to Hendryx and Teague (2001), the strongest predictor of outcome was clinical information about that particular outcome at intake. For example, initial severity predicted subsequent severity. Other variables added little predictive value over and above the intake score for a particular outcome. However, several characteristics did show statistical significance in predicting one or more of the outcomes (symptoms, role performance, relationships, consequences, family impact). These characteristics included disruptive behavior, mental retardation, treatment at a young age, parent incarceration, and family functioning. According to the authors, their findings highlighted the importance in controlling for scores at intake. They further acknowledged a lack of power in exploring predictors and encouraged researchers to continue to explore potential predictors of differential outcomes.

Generally, researchers have not found consistent significant predictors of clinical outcomes (e.g., Eisen, Griffin, Seder, & Dickey, 1995; Visser et al., 2003). Mixed findings have been noted frequently in correlational research of numerous characteristics and youth outcomes. In exploration of data from the Fort Bragg study, Lambert, Nixon, Simpkins, and Bickman (1996) noted few significant predictors of youth outcomes. While there was some evidence of differential outcomes related to age, they found no predictive value for gender or race. In a further exploratory analysis of 83 variables, they found only two significant predictors of outcome. Youth who had a history of service utilization or prior problems demonstrated less improvement than first-time cases. Youth history of abuse, substance use, arrests, residential treatment, and having two parents in the home did not predict outcomes.

Some researchers have explored predictors of treatment outcomes for narrower populations. That is, they have investigated predictors for specific treatment (e.g., day treatment, cognitive behavioral therapy, multisystemic therapy) and often related those predictors to a single diagnosis (e.g., depression, PTSD, ADHD). For example, Hussey and Guo (2002a; 2002b) examined predictors of outcomes for children who received residential and partial hospitalization services. In both studies, they noted that younger females with lower intelligence faired worse. Additionally, the number of previous out-of-home placements predicted poorer child outcomes following partial hospitalization. Poorer outcomes (i.e., suicide attempts) folowing emergency psychiatric admission were noted for suicidal youth with more depressive symptoms and greater parent control at home (Huey, Henggeler, Rowland, Halliday-Boykins, Cunningham, & Pickrel, 2005). It may be that predictors are more easily identified in homogenous samples treated for the same disorder or receiving similar, manualized treatments.

The following section briefly highlights pertinent literature about the relationships between youth, family, and treatment /provider characteristics and youth treatment outcomes.

Youth Characteristics

Age, race, and gender. Researchers have suggested that demographic variables including age, gender, and ethnicity are important to consider when exploring utilization and health outcomes of youth (Andersen & Davidson, 1997; Robbins et al., 2001). Although rates of SED do not seem to vary by race (Costello et al., 1998), service utilization, perceived barriers, service satisfaction, and dropout have been found to differ by race (e.g., Richardson, 2001). The majority of studies exploring service utilization have found that minority populations are under-represented in mental health services (e.g., Mowbray, Lewandowski, Bybee, & Oyserman, 2004). Visser et al. (2003) found poorer long-term outcomes for youth from ethnic minorities in a clinic-referred sample.

Warner, Pottick, and Manderscheid (2002) found that age was related to increased rates of dual diagnoses and the number of presenting problems. Yet several researchers have noted that younger children at intake demonstrated poorer outcomes after treatment (Hessey & Gio, 2002a; 2002b). Lambert et al. (1996) observed slightly better improvement for young teens. Some studies have shown gender to be associated with improvement. For example, several studies have noted that girls were at increased risk for poorer outcome (e.g., Hussey & Guo, 2002a; 2002b; Stanger, McDonald, McConaughy, & Achenbach, 1996; Visser et al., 2003).

Diagnosis. Bickman and colleagues (Bickman, Karver, Lambert, & Wighton, February, 1998) asserted that diagnosis has little value in services research. They stated that while severity at intake has a strong relationship to improvement, diagnosis has little connection. However, comorbidity may be related to service use and youth improvement. A number of studies have found that youth with comorbid mental health and substance abuse diagnoses initiate substance use at a younger age and demonstrate more family, school, and criminal problems (e.g., Grella, Hser, Joshi, Rounds-Bryant, 2001). However, how this is related to treatment outcome is uncertain.

Several researchers have argued for the importance of diagnostic distinctions. Fonagy and Target (1994) found that youth with emotional disorders improved more rapidly than did youth with disruptive disorders. Hendryx and Teague (2001) argued that risk-adjustment models should be developed individually for different clinical populations. More specifically, for adult diagnoses, they highlighted schizophrenia, major depression, bipolar, and substance abuse disorders in their analyses. These designations resulted in different sets of predictors from multilevel models.

Abuse. Considerable research has investigated the negative impact of childhood abuse on children's mental health. High rates of mental health symptoms have been found among children with a history of abuse (e.g., Burns et al., 2004). Research also has demonstrated the co-occurrences of abuse, family substance use, violence, financial difficulties, and mental health issues (Walrath, Ybarra, Holden, Liao, Santiago, & Leaf, 2003). In the national evaluation of the Comprehensive Community Mental Health Services for Children and Their Families Program, Walrath and her colleagues (Walrath et al., 2006) found that children with abuse histories consistently presented with more troublesome and complex family challenges. However, most of this research has focused on youth in child protective services rather than in community-based services (Walrath, Ybarra, Sheehan, Holden, & Burns, 2006). Although, this research suggests that history of abuse increases utilization of services, little is understood about the impact on youth outcomes.

In the Fort Bragg Demonstration, Lambert et al. (1996) did not find that youth history of abuse predicted youth outcome. Walrath et al. (2006) suggested that the numerous challenges faced by families of children with abuse histories may have a "synergistic effect in conferring risk for negative outcomes for some children" (p. 144). While they found some evidence that abuse histories impacted 6-month outcomes, Walrath et al. (2006) suggested that the individualized treatment services had an equal more important relationship with youth outcomes. Perhaps more importantly, the researchers suggested that individualized services for these youth and families needed to include broad supportive services given the high rates of substance abuse, domestic violence, and mental illness in families with abuse histories.

Need. One of the most often studied factors related to service use is **need**, typically measured by symptomology or impairment. Of all factors investigated, need is probably the most consistently related to physical or mental health service use (e.g., Aday et al., 1993; Leaf et al., 19888; Riley et al., 1993). Moreover, as noted previously, need defined as intake domain scores often has been found to be the strongest predictor of outcome (e.g., Hendryx & Teague, 2001 Lambert et al., 1996).

Family Characteristics

Utilization of heath services by children and adolescents is complicated because, to a large extent, youth depend upon their parents or guardians to access services. Singh and Oswald (2004) argued that evidenced-based practice integrates clinical experience with the research evidence. The researchers promoted client-centered care, determined case by case. They urged clinicians to consider client and family concerns in defining outcomes. Family characteristics including lack of reliable transportation, chaotic home environments, family conflict, competing personal or family issues, and employment conflicts have been associated with lower health service utilization (Aday et al., 1993; Riley et al., 1993; Riportella-Muller et al., 1996). The argument certainly could be made that these characteristics also may affect service participation, engagement, and dropout, thereby impacting outcomes.

Parent mental health diagnosis. Children of parents with a history of alcohol or drug disorders are much more likely to develop a substance use disorder (e.g., Chassin, Pitts, & Prost, 2002). Similarly, children of parents with a mental illness are at greater risk of psychiatric disorder. Several studies have found that maternal stress and mental illness are predictive of youth service utilization (e.g., Mowbray et al., 2004; Riley et al., 1993).

Caregiver strain. Caregiver strain is the stress parents feel as a result of caring for a child with mental illness. The Caregiver Strain Questionnaire (CGSQ), used in this study, distinguishes between objective and subjective strain. Objective strain includes observable disruptions in family and community life (e.g., interruption of personal time, lost work time, financial strain). Subjective strain involves caregivers' feelings or interpretations related to their children's disorders and the disruptions they experience (i.e., worry, guilt, fatigue, resentment, embarrassment). It is well established that individuals who provide care for family members with mental illness experience considerable stress and emotional strain (e.g., Schultz & Rossler, 2005). Research has demonstrated that youth whose caregivers reported greater strain where more likely to seek services, receive more intensive services, and have longer lengths of stay (e.g., Brannon, Heflinger & Foster, 2003; Garland, Aarons, Brown, Wood, & Hough, 2003; Lambert, Brannan, Breda, Heflinger, & Bickman, 1998). Caregiver strain has been associated with increased risk of youth alcohol and drug use and substance use disorders (Pullman, Brannan, & Stephens, 2004). Recent evidence suggests that ethnicity may moderate caregiver strain. Kang, Brannan, and Heflinger (2005) found that African American mothers reported lower levels of strain. The implications are not clear, as

Brannan and Heflinger (2005) noted differential patterns of access and services use depending on state-wide systems of care. Greater understanding of the impact of caregiver strain on outcomes is needed.

Practice-level or Treatment Effects

Research related to evidence-based practices has underscored the importance of assessing provider and practice-level characteristics (e.g., Glisson & Hemmelgarn, 1998; Glisson & James, 2002; Schoenwald et al., 2003). Yet, relatively little research has attempted to explore and tease out practice-level factors that may directly impact or mediate outcomes for youth and their families (Stephens et al., 2004). In an evaluation of the Comprehensive Community Mental Health Services for Children and Their Families Program, Stephens et al. (2004) hypothesized that service delivery that was consistent with system of care principles would be linked with better youth and family clinical outcomes. Their assumption was only partially supported. This relationship between service characteristics and outcomes was evident only across comparison sites and not within the federally-funded demonstration sites. However, all sites demonstrated fairly high adherence to system of care principles.

Satisfaction with services. Measelle, Weinstein, and Martinez (1998) found that parent satisfaction with services was related not only to what case managers do but also to how the services impact youth outcomes, particularly impacting the likelihood of remaining in the home. Specifically, after controlling for baseline diagnosis, impairment, and psychosocial stress, the number of monthly case management contacts and fewer inpatient days best predicted parent satisfaction.

Gerkensmeyer (2001) tested an adaptation of the Satisfaction-Outcomes Relationship Model (Gotlieb, Grewal, & Brown, 1994; Lerman & Glantz, 1997) that posited that parents' satisfaction with services impacts their self-appraisal of coping (i.e., self-assessment of their ability to address their child's mental health issues) which in turn effects their coping behavior (i.e., strategies) which in turn impacts outcomes (i.e., adaptations to parent and youth stressors). She found an indirect relationship between satisfaction with services and more distal outcomes, thus supporting the model.

Caregiver involvement in treatment. System of care principles strongly emphasize parent and family involvement in children mental health treatment. As mentioned previously, at a minimum, some involvement or at least cooperation is needed to initiate and maintain services. Yet, the impact of parent involvement on youth outcomes has not frequently been explored. The research that does exist is inconsistent. Nye, Zucker, and Fitzgerald (1995) noted that parent involvement in their child's treatment for conduct disorder predicted child outcome. In contrast, Noser and Bickman (2000) did not find a relationship between parent involvement in treatment and child outcomes. Reich, Bickman, and Heflinger (2004) explored the caregiver characteristics that might be related to self-efficacy, including parent involvement. They found that caregivers' attitudes of collaboration with providers was the strongest predictor of self-efficacy.

Engagement. Ongoing involvement in mental health services can be predicted by the extent to which clients' expectations are met as well as by their involvement with **innovative** services (e.g., McKay, Harrison, Gonzales, Kim, & Quintana, 2002; Nook & Kazdin, 2001). However, the relationship between length of stay and outcome has been much debated. Similarly, Bickman, Andrade, & Lambert (2002) found no statistically significant relationship between dose and youth outcomes. Others have posited a nonlinear relationship between frequency of contact and youth outcomes (e.g., Howard, Kopta, Krause, & Orlinsky, 1986). In an evaluation of community mental health services, Angold, Costello, Burns, Erlanki, and Farmer (2000) noted a significant relationship between the amount of treatment and symptom improvement. It may be more important to include length of stay in multi-level models of outcome. For example, Harman et al. (2004) demonstrated that differences across hospitals accounted for 32%, 36%, and 11% of the variance in length of stay for consumers with depression, schizophrenia, and bipolar disorders, respectively. This contrasted with the roughly 6% of the variance that was explained by physician or provider practice.

Summary

The review of the literature uncovered considerably more exploration of predictors of psychopathology and service use than the prediction of mental health treatment outcomes for children and adolescents. Further, findings were often inconsistent across studies. The literature does suggest, at a minimum, that analyses should control for severity at intake as well as for nuisance variables when constrating outcomes across groups.

The literature review, coupled with the conceptual model discussed in the next chapter, supports the inclusion of several factors in testing the specific aims of this study. The AdvoCare dataset is rich in information; but given the sample size, a limited set of predictors is required in order to lessen risks of overfitting the planned models (Harrell, 2001). The inclusion of unjustified variables, or “fishing,” decreases statistical power.

The next chapter presents the study’s conceptual framework. The model hypothesizes that relationships between youth, caregiver, and provider-level characteristics are potentially related to differential youth outcomes. The conceptual framework offers a better understanding of the dynamic interactions that are possible when designing and implementing program quality improvement initiatives to improve outcomes for children with SED and their families.

CHAPTER III

CONCEPTUAL FRAMEWORK

Overview

A variety of perspectives and corresponding conceptual models are braided to form the basis of this study's framework. Although defining quality of care has been infrequently tackled, the next section briefly outlines efforts to define quality. This is important as that definition ultimately should drive program development, implementation, and evaluation. Next, although this study does not explore the effectiveness of treatment per se, it does draw upon several models of treatment effectiveness and services research as the theoretical basis to investigate differential treatment outcomes. This chapter includes reviews of three relevant models of effectiveness that contributed to the foundation of the model. Finally, the conceptual model that guided the study is discussed.

Defining Quality of Care

The manner in which quality is defined is critical as it leads directly to the assessment of and efforts to improve quality of care (McGlynn, Norquist, Wells, Sullivan, & Liberman, 1988). Historically, most researchers have avoided the difficult task of defining quality (Wyszewianski, 1988a). The definitions that have been offered range from narrow to broad and have been proposed by researchers, professional organizations, and government entities (e.g., Brook, 1973; Donabedian, 1969, 1980; Wyszewianski, 1988a). In 1990, the Institute of Medicine (IOM) defined quality as:

> The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge. (1990p. 1)

In the last decades of the twentieth century, competition among health care organizations and managed care grew due to rising healthcare costs, and more emphasis was placed on outcome measurement. The consequence was relatively greater attention to definitional and measurement issues related to quality (Schuster, McGlynn, & Brook, 1998; Wyszewianski, 1988b). Since the releases of two influential IOM reports, To Err is Human (1999) and Crossing the Quality Chasm (2001), attention to poor quality has increased, particularly the pervasiveness of errors. Approaches to addressing shortcomings in quality more often rely on data and evidence rather than aesthetic or putative indicators of quality, such as standards and practice guidelines (Salzer, Nixon, Schut, Karver, & Bickman, 1997). This shift has been characterized as a move from quality assurance to quality management (Stricker & Shueman, 2000).

In the past decade, the IOM has been active in efforts to tackle quality of care issues and has essentially called for the redesign of the national healthcare system. In 2005, the IOM recommended a federal effort to develop a universal, standardized set of performance measures. The approach has been echoed by some politicians (e.g., Frist, 2005).

The Crossing the Quality Chasm (2001) report put forth a hierarchical framework conceptualizing quality. The framework includes the patient, their families ,and communities (A); healthcare providers at the micro-level (i.e., individual, teams) (B);

providers at the macro-level (i.e., organizations) (C); and system-level factors such as accreditation, policy, payment, etc. (D). The report defined Level A as the most important. Berwick (2002) stated that patients are the “fundamental source of the definitions of quality . . . . [and] we should judge the quality of professional work, delivery systems, organizations, and policies first and only by the cascade of effects back to the individual patient . . .” (p. 89).

Differences across definitions of quality arise primarily as a result of diversity in scope, level of concern, or perspective (Donabedian, 1980). Additionally, definitions of quality are invoked for a variety of purposes, and thus, the measurement of quality may differ in emphasis on structural, process, and outcome variables.

Although many differences across definitions exist, there are similarities as well. Definitions of quality generally portray quality as consisting of multiple domains or components (Nixon, 1997a). Another commonality often distinguishes between technical and interpersonal care. Technical care is concerned with the application of scientific knowledge and technology; whereas interpersonal care is related to relationships (i.e., communication, caring) (e.g., Brook, Davies, & Kamberg, 1980; Donabedian, 1980; Lohr, 1988).

Most of the definitions link quality to outcomes. That is, the criterion for determining the degree of the quality of health or mental health care is the extent to which care improves desired outcomes. Donabedian and others extended the conceptualization of quality to include process (e.g., IOM, 2001; McGlynn et al., 1988). It is in light of the assessment of quality that Donabedian (1969; 1980) expanded upon structure, process, and outcomes as different approaches to measuring quality (discussed in the next section). McGlynn et al. (1988) portrayed quality in mental health care as consisting of three basic elements. However, in contrast to Donabedian, they reversed the order of the elements, depicting it as:

OUTCOMES ➔ PROCESS ➔ STRUCTURE

in order to emphasize the need to let important outcomes "define" relevant process and structural variables. This conceptualization is consistent with the framework proposed by Crossing the Quality Chasm.

The majority of conceptualizations of quality have stemmed from the physical health care field as opposed to behavioral health. The IOM (2005) recently released a report focused on the need to improve quality of care for individuals with mental health and substance abuse issues. This is key as behavioral healthcare typically encompasses a broader range of services (McGlynn et al., 1988). Furthermore, the ecological context of the family and influence of the living environment may impact mental illness to a greater degree than physical illness (McGlynn et al., 1988). Moreover, various stakeholders' views of quality or outcomes tend to differ more than in physical health care (e.g., McGlynn et al., 1988; Ware, 1995). For example, a patient, his/her family, the health care providers, and the public at large would tend to agree that lower cholesterol was positive. In contrast, in behavioral healthcare, the value of hospitalizing a 12-year old might be debated among the child, his/her family, therapists, insurers, and advocates.

For this study, quality of care was conceptualized in a manner similar to definitions McGlynn et al., 1988 and found in Crossing the Quality Chasm. It is consistent with Donabedian's tripartite model discussed in the next section but includes more of an ecological and dynamic flavor. Finally, quality cannot be defined without considering the multiple, and often varying, perspectives of stakeholders (Nixon, 1997b).

Conceptual Models of Service Utilization & Effectiveness

Two perspectives drive the conceptual frameworks that underlie most effectiveness research (Aday, Begley, Lairson, & Slater, 1998). One perspective examines a **macro** view or population perspective (e.g. Evans, Barer, & Marmor, 1994; Milio, 1983), while the second posits a **micro** view encompassing the clinical perspective (e.g., Donabedian, 1966, 1980; White, Williams, & Greenberg, 1961).

At first glance, these models seem quite discrepant. The macro perspective includes those who utilize health services and those who do not. Moreover, macro perspectives generally explore the impact of physical, social, and economic factors on health. Alternatively, micro or clinical perspectives are driven by health outcomes realized by those utilizing medical care. Research based on a micro view tends to explore the interactions of healthcare systems, providers, and patients.

Yet, both perspectives commonly look across multiple levels or determinants in determining health, whether for the population as a whole or for consumers. Aday et al. (1998) defined four levels of effectiveness research from broad to narrow: community, system, institution, and individual. The first tends to be associated with the macro or population perspective while the others more often are linked with clinical views.

In the “big picture,” both perspectives are important in considering the effectiveness of healthcare. Both contribute to the overall understanding of health, healthcare, service utilization, and quality of care. However, the current study focuses on the behavioral health outcomes of those who utilize intensive mental health services rather than epidemiological or barrier/access issues, for example. As a consequence, this study is more consistent with and informed by a micro-level perspective.

Donabedian's Tripartite Model

Donabedian (1966; 1980) has written extensively about quality improvement in health care. His tripartite model of quality -- including structure, process, and outcome – is well known. Consideration of the three concepts simultaneously enables exploration of predictors of outcome and furthers quality improvement efforts (Salzer et al., 1997).

Structure refers to "the relatively stable characteristics of the providers of care, of the tools and resources they have at their disposal, and of the physical and organizational settings in which they work" (Donabedian, 1980, p. 81). Structure encompasses the characteristics of the health care system, providers, and target population that exist prior to the delivery of services. Certain aspects of policy, the health care system, individual providers, the target population, and targeted individuals can both enable efficient and effective delivery of health services as well as hinder receipt of services.

Process refers to aspects of delivering an intervention and includes technical as well as interpersonal aspects of care (see discussion to follow). Decision-making, provision of treatment, assessment of the problem, follow-up, and consumer/provider communication are all aspects of the process of care.

Outcome is defined as a change in the consumer's health status as a result of the care received. It includes improvements in social, psychological, physiological, and physical health status as well as consumer attitudes, health-related knowledge, and behavior change.

Donabedian’s model, as well as a broad youth and family-centered conceptualization of quality, contributed to the design of AdvoCare’s QIA. As mentioned previously, Donabedian recommended simultaneous measurement of structure, process, and outcome in order to assess quality of care. The QIA incorporated from all three domains. Similarly, this study simultaneously considers structure, process, and outcomes. Specifically, this study explores the relationship between several structural and process characteristics and youth outcomes within an ecological perspective. The structural characteristics suggested by the literature as potentially important include child and family demographics and parent perceptions. Process characteristics include service deliver characteristics and parent coping skills related to treatment.

However, a drawback exists to the sole reliance on Donabedian’s model for researching children’s mental health services. The model fails to account for the importance and impact of the broader family context on mental health outcomes of children and adolescents receiving services. For example, parent perceptions, attitudes, and strain do not have clear roles in the model. The complexity of family environments and the potential impact of such environments on children’s health services remain unexplored.

Behavioral Model of Health Services Use

Another model that has been widely adapted to study health care utilization is the Behavioral Model of Health Services Use (e.g., Aday & Andersen, 1974; Andersen & Davidson, 1997; Jones, Heflinger, & Saunders, 2006; Leaf et al., 1988). The model has served as the conceptual backbone for a wide variety of service utilization studies, including access to health services for children with special health care needs (Aday et al., 1993); equity of access to health services (e.g., Aday & Andersen, 1981); and predictors of mental health services use (e.g., Leaf et al., 1988).

Over time, the model has shifted from a predominantly micro-level perspective to a broader, macro-level approach. It has been extended to incorporate service effectiveness as opposed to more narrowly, service utilization (Andersen, 1995). The model's earliest presentations (e.g., Andersen, 1968) depicted an individual family's service use as the ultimate outcome of concern to researchers. Outcomes result from interactions of predisposing characteristics, enabling factors, and health care need. More recently, the model has evolved to focus more broadly on an aggregate population's use of services. Utilization is considered a proximal outcome, while health and mental health status are deemed ultimate outcomes (Andersen, 1995). This evolution reflects the recent emphasis on outcomes accountability and the importance of consumer input in determining the quality of services.

For the present study, predisposing factors are those family and individual characteristics that exist prior to the onset of illness and relate to one's inclination or propensity to use medical services (Andersen, 1974; Leaf et al., 1988). For example, predisposing factors include sub-components of family composition (e.g., sex, age, family size), social structure (e.g., employment, race, ethnicity, education, social class), and health beliefs.

Enabling characteristics are those conditions that allow an individual or family "to act upon a value or satisfy a need regarding health service use" (Aday & Andersen, 1974, p. 16). In other words, enabling factors facilitate the use of services. However, Leaf et al. (1988) included factors that inhibit the use of services. Similarly, Selby, Riportella-Muller, Sorenson, Quade, and Luchok (1992) defined enabling factors as supports or barriers (p. 562). Some researchers also have included community resources with family and individual characteristics when defining enabling factors (e.g., Aday & Andersen, 1974). For purposes of this study, enabling characteristics are considered supports and barriers; yet, resources are considered to be a separate component.

Need was defined by Aday and Andersen (1974) as "the amount of illness perceived by the family and by the way the family responds to the perception" (p. 17). Leaf et al. (1988) maintained that "predispositions should not result in help seeking except under the condition of perceived need" (p. 11). Prior mental health services research has pinpointed need as the most powerful predictor of service use (e.g., Aday & Andersen, 1974; Bickman et al., 2000). Andersen's definition of need includes both perceptions and responses. In his General Theory of Help-Seeking Behavior, Mechanic (1978) more fully distinguished between these concepts. He posited that an individual's use of health services is dependent upon two factors: (1) the individual's perception of the situation and whether the situation is abnormal, and (2) the individual's ability to cope with the situation. Thus, service seeking is related to an individual's assessment that he or she cannot adequately cope with a situation alone.

It is important to distinguish between these concepts (e.g., need or symptom severity) and an individual's or family's perception of (a) the departure from normality and (b) the impact of the symptoms. Another potential shortcoming of the model is that it does not highlight the dynamic, ecological impact of the family, particularly in relation to family attitudes, perceptions, coping, and adaptation.

Double ABCX Model

A third theoretical framework particularly applicable to this study is the ABCX Model. The model is a framework within which to examine family adjustment to stress. Originally posited by Hill (1949), the ABCX Model was subsequently expanded and adapted by others (e.g., Brannan & Heflinger, 2001; McCubbin & Patterson, 1983; Orr, Cameron, & Day, 1991; Heflinger, Northrup, Sonnichsen, & Brannan, 1998). It has been most commonly used when examining outcomes of mothers/parents of children with developmental disabilities (e.g.. Bristol, 1987; Hastings, Daley, Burns, Beck, 2006; Jones & Passey, 2005; Saloviita et al., 2003). However, it also has been used to frame research about adjustment to brain injury, cancer, Alzheimer's disease, death of a loved one, and divorce.

McCubbin & Patterson (1983) proposed that a family's adaptation to stressors was mediated by existing and new resources, the family's perceptions of the stressors, and the coping responses. Their "Double ABCX" model expanded Hill's (1949) conceptual model by incorporating time, and hence, the pile-up of multiple stressors, coping, and post-crisis adaptation (Saloviita et al., 2003). Figure 1 reproduces Heflinger et al.'s (1998) adaptation of the Double ABCX model for use in mental health services research.

The model underscores the importance of assessing outcomes from an ecological perspective (Heflinger et al. 1998) both within families and communities (Bronfenbrenner, 1979). Especially when examining outcomes for children, it is unlikely that consideration of children independently from their families will result in any meaningful, real-world understanding of their outcomes. Particularly related to health care utilization, youth most often depend on their parents to initiate, enable, and/or maintain healthcare services (Streisand, Braniecki, Tercyak, & Kazack, 2001). Although adolescents sometimes initiate use of health care services, younger children rarely do. Even when children are referred to services by a third party (e.g., courts, social services, schools), parents are responsible for transportation and scheduling at a minimum. Many family characteristics may moderate or mediate youth and family outcomes; thus, it is critical that these factors be identified through theory and included in research (Heflinger et al., 1998).

Further, the Double ABCX model highlights the complexity of considering adjustment within the context of the family. It considers psychological, social, and stressful events simultaneously. The model is most suited for micro-level explorations of the interactions between structure, process, and child mental health outcomes, or similarly, predisposing, enabling, and need characteristics, but within the broader context of the family.

Stressors experienced by the family can encompass past and present events that impact the family or individual family members. From a transactional model of stress

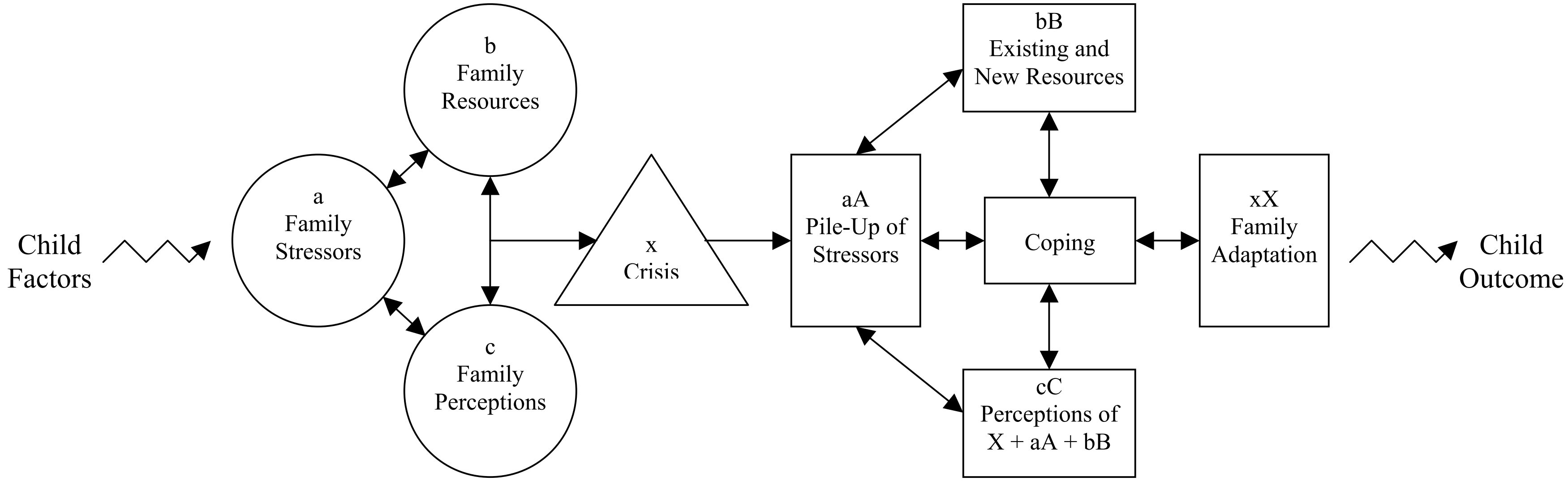

Figure 1. Double ABCX Model [1]

[1] Proposed by Heflinger et al. (1998) and adapted from McCubbin & Patterson (1983)

and coping, stressors include demands by the internal or external environment that upset the balance of physical or psychological well-being (Lazarus & Cohen, 1977). Examples include trauma, accidents, disability experienced by family members, level of symptoms, and impairment, as well as general life events such as job changes/loss, divorce, death, life transitions, legal issues, etc.

Resources are those existing and potential concrete aids and skills that families use to meet their needs. Examples include formal and informal social support, interventions and services, finances, personal qualities, and family/individual competencies.

Perceptions refer to the meanings assigned by family members about stressors and resources. Glanz, Rimer, and Lewis (2002) distinguished between primary appraisal, the evaluation of a stressor, and secondary appraisal, the assessment of the controllability of the stressor and resources. Perceptions involve judgments about the significance or quality of stressors. The four primary appraisals are benign, threat, harm/loss, and challenge (Lazarus & Folkman, 1984).

Coping refers to the attempt to restore balance in family functioning, bridging the gap between perceptions and resources (Saloviiata et al., 2003). It involves both cognitive and behavioral responses (Heflinger et al., 1998). As opposed to psychoanalytic and personality approaches to coping, this perspective relies primarily on cognitive behavioral models. Moreover, coping is viewed as flexible and dynamic, depending on the environment and personal preferences (Aldwin & Yancura, 2004). The emphasis is on situations and specific stressors as opposed to individuals' coping styles.

Aldwin and Yancura (2004) listed five general types of coping strategies that are not mutually exclusive: problem-focused, emotion-focused, social support, religious, and making meaning. They claimed that the way individuals interpret situations impacts how they cope. Heflinger et al. (1998) asserted that many aspects of service utilization (e.g., assessing services) fall within the conceptual realm of active coping.

<u>Adaptation</u> is considered an outcome of the coping process (Glanz et al., 2002). It has been measured in a myriad of ways, typically driven by the research arena in which the model is applied. Adaptation has been conceptualized as psychological well-being, psychological distress, health or mental health status, marital satisfaction, family functioning, caregiver strain, and quality of life (Heflinger et al., 1998; Saloviita et al., 2003). The most common measure has been of parental stress or psychological symptoms (Saloviita et al., 2003). Finally, although the Double ABCX model portrays the family as a unit, most studies have assessed individual- rather than at the family-level outcomes (Heflinger et al. 1998).

All constructs included in the Double ABCX model – resources, perceptions, coping, and adaptation – can be viewed on a continuum ranging from positive to negative. That is, resources can range from adequate to inadequate; families' perceptions and coping strategies can be characterized as positive or negative; and finally, adaptation can be viewed on a continuum from bonadaptation to maladaptation (McCubbin & Patterson, 1983). Hastings and Taunt (2002) reviewed research related to families of children with disabilities. They concluded that families of children with disabilities reported positive and negative perceptions and more stress than families of children without disabilities; however, there was no evidence that families of children with disabilities reported less positive perceptions than families of children without disabilities. The authors concluded that there are different variables associated with negative and positive perceptions, and thus, each dimension should be explicitly measured. Ultimately, Hastings and Taunt (2002) asserted that positive perceptions may moderate the coping process.

There is a great deal of variation in families' responses to stressors (Hastings et al., 2006). Many families report positive perceptions and adjustment even when faced with major stressors, such as having a child with autism or a mental health disorder (e.g., Hastings and Taunt, 2002). Hastings and Taunt (2002) also emphasized that dependent variables should assess both positive and negative dimensions. In fact, McCubbin and colleagues have highlighted the concept of resiliency (e.g., McCubbin, Thompson, Thompson, & McCubbin, 1993).

Research exploring the relationships posited by the Double ABCX model has generally supported the inclusion of the each of the components and their relationships. Saloviita et al. (2003) found that the best predictor of parental stress for parents of children with intellectual disabilities was negative appraisals of the situation. They also found an interaction between parent gender and appraisal. For mothers, children's behavior problems heightened stress, while fathers responded more to the social acceptance of the child. Numerous researchers have reported higher levels of stress (as the dependent variable) among parents of children with developmental and mental health disorders (i.e., assumed to yield greater pile-up of stress relative to families of children without disorders) (Hastings & Johnson, 2001; Heflinger et al., 1998; Nachshen & Minnes, 2005). In fact, Beck, Hastings, Daley and Stevenson (2004) found that parental levels of stress directly related to the intensity of children's behavior problems rather than the severity of cognitive disabilities. Moreover, parental coping and social support (typically viewed as resources) have been demonstrated to mediate negative outcomes for parents of children with disabilities and behavior problems (Hastings & Johnson, 2001; Jones & Passey, 2005).

Inasmuch as researchers have generally found broad support for the Double ABCX model across a number of different areas of research (e.g., Bristol, 1987; Lustig & Akey, 1999), there are some discrepancies in findings regarding the direction of effects. Orr et al. (1991) found that a linear ABCX model best described the adaptation of families of children with developmental disabilities. Specifically, they found that stressors led to perceptions, which led to use of resources, and finally, resulted in the expression of stress. At the same time, others have questioned whether there is a direct relationship between stressors and families' use of resources (e.g., Nachshen & Minnes, 2005).

Aldwin and Yancura (2004) listed five possible mechanisms that may account for the relationship among the components of the Double ABCX model: direct, mediated, moderated, contextual, or spurious. However, after reviewing the literature, most researchers do not fully describe the relationships among the model's variables even though they rely on the model and its constructs (i.e., stressors, resources, perceptions, and coping).

Because the Double ABCX model addresses a very generic process (i.e., adjustment to stress) and has been applied in different arenas (e.g., disabilities, behavioral health, divorce, death, etc.), the components have been operationalized and measured in a plethora of ways. Construct validity of some measures, particularly in extending the model to mental health services research, has been questioned (Heflinger et al., 1998). Adding to problems of interpretation, some constructs have been operationalized for more than one component of the Double ABCX model. For example, Heflinger et al. (1998) as well as Brannan et al. (2003) viewed caregiver strain and psychological distress as measures of adaptation. Distress, in fact, has been viewed most often as adaptation or the dependent measure of interest. In contrast, Saloviita et al. (2003) included measures of the experience of having a child with intellectual disabilities and burden of care as operationalizing perceptions.

Model Used in the Study

This study was guided by the conceptual model of youth mental health outcomes pictured in Figure 2. The model describes youth mental health outcomes as impacted by child and family predisposing, enabling, and need characteristics; pile-up of stressors; caregiver perceptions; existing resources and new mental health services; and child and family coping responses related specifically to treatment. The conceptual model is based primarily on the Double ABCX model (Herflinger et al., 1998; McCubbin & Patterson, 1983); although, it incorporates aspects of frameworks advanced by Aday, Andersen, and colleagues (e.g., Aday & Andersen, 1974; Andersen & Davidson, 1997). It differs by including community-level characteristics that potentially impact youth, families, and service providers and subsequently, youth outcomes. Chapter 4 details how each component of the model was operationalized.

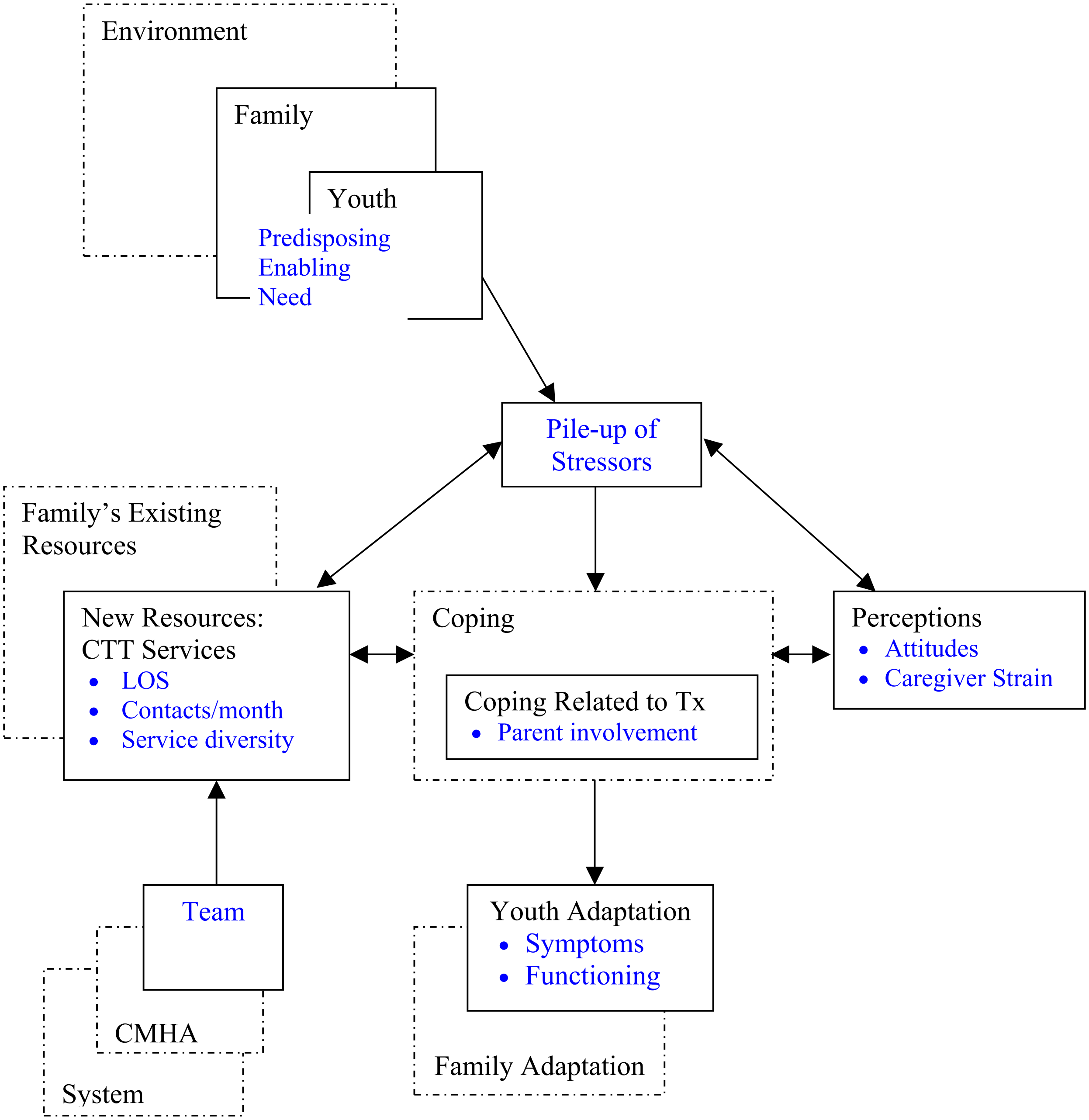

Figure 2. Conceptual Model of Youth Mental Health Services Outcomes [1, 2,]

[1] Concepts displayed in blue font were included in the study.
[2] Components displayed with dotted lines were not measured but are included as important components.

CHAPTER IV

METHOD

Research Questions

The overarching goal of this study was to explore the relationship between youth, family, and service characteristics and the differential clinical outcomes experienced by youth who participated in CTT services. The study evaluated five theory-driven questions based on the Youth Mental Health Services Outcomes Conceptual Model (Figure 2):

- Do youth and family predisposing and enabling factors predict outcome?
- Are youth outcomes worse for youth who have experienced a greater pile-up of stressors?
- Do positive parent perceptions, specifically caregiver strain and parent hopefulness, relate to better youth outcomes?
- Are characteristics of service delivery related to youth outcomes?
- Are youth outcomes moderated by their caregivers' active involvement in managing their children's mental illnesses?

Study Background

Because the study was a secondary analysis of an existing dataset, a brief description of the project that yielded this dataset is provided here. More detailed descriptions of AdvoCare's Quality Improvement Initiative (QIA) can be found elsewhere (e.g., Nixon, 2002; 2004; 2006). In April 2002, AdvoCare implemented a QIA to: (1) identify opportunities for quality improvement for Community Mental Health Agencies (CMHAs) implementing CTTs, (2) collect information about team processes and structure that may be related to youth outcomes, (3) describe outcomes of youth participating in CTT, and (4) contribute evidence and recommendations to inform annual revisions to AdvoCare's SSOC guidelines for CTTs.

Overview of Continuous Treatment Teams

Child and Adolescent Continuous Treatment Teams encompass a model of intensive case management for youth with mental illness (who qualify for TennCare) and their families. CTTs are implemented statewide by providers contracting with the managed behavioral health organizations (managed by AdvoCare). The guidelines for services delivery and eligibility criteria are thoroughly described in AdvoCare's policy and procedures manual entitled Supervised System of Care (SSOC) Guidelines (e.g., AdvoCare, 2005).

CTT is a strength-based model consistent with system of care principles. It aims to prevent youth out-of-home placement by providing coordinated, comprehensive treatment and rehabilitative services. It focuses specifically on youth with major mental disorders who have not benefited from traditional services. Services emphasize active family involvement and cultural competence. CTT services are intensive – requiring a minimum of 10 contacts a month – and available 24 hours a day and 7 seven days a week. Services are community-based, and the majority of services are delivered out of the office (i.e., school, home, etc.). The services are multidisciplinary and team-based. Each team must include at least four case managers, a nurse, and a psychiatrist.

Caseloads cannot exceed 1:6. Services include crisis intervention and stabilization, counseling, skill building, therapeutic intervention, advocacy, educational services, medication management, and school-based counseling, among other services.

AdvoCare's QIA: Overview of Methods

Five teams based at CMHAs in west Tennessee were invited to participate in the QIA. These teams had been delivering CTT services since the program's inception in March 2000 and had well-established programs based on AdvoCare's SSOC audits.

Youth and their families admitted to these CTTs between April 2002 and December 2004 (and followed through discharge) were included. As part of the QIA, information describing structural and process characteristics were gathered in addition to measures of child and family outcomes. For example, measures of organizational culture, climate, and work attitudes were collected every six months. Youth and family demographics, health status, and services history was assessed at intake. Service utilization data spanned 2001-2005 and included data before, during, and after youth CTT service participation.

CTT case managers were trained to collect the majority of the data for the QIA. AdvoCare provided on-site training prior to the start of the project as well as booster training approximately every six months during the study. Comprehensive manuals were provided to all case managers and supervisory staff. These included an overall description of the QIA, related research articles/summaries, the data collection schedule and protocol, and copies of all measures with pertinent administration and interpretation protocols provided by the developers (e.g., Ohio Scales User's Manual).

For each enrolled youth, case managers completed a brief tracking form monthly that captured several youth outcome indicators such as global functioning, school status, housing, youth medication compliance, caregiver involvement in treatment, and legal system involvement. Every 3 months, case managers provided ratings of youth symptoms and functioning. They also conducted interviews with parents and youth (inclusion determined by age and specific measure) at intake, discharge, and every 6 months while youth were enrolled in CTT services. Optionally, teams could choose to collect an additional family interview at 3 months after intake. The surveys given to parents and youth measured youth symptoms and functioning, family functioning, hopelessness, satisfaction with services, and caregiver strain.

Once data collection began, teams sent the completed assessment packets to AdvoCare's external contractor on a monthly basis. Data were entered quarterly and reports returned that detailed missing data (e.g., pages, demographic and risk factors collected on the intake form, etc). Booster training frequently addressed issues of missing data and successful strategies for engaging families in data collection.

Program fidelity of the CTTs was measured by the Wraparound Fidelity Index (WFI, version 2.1) that measured the extent to which services were consistent with eleven core principles of wraparound services. Youth and their parents who provided written informed consent after discharge were interviewed about their experiences with CTT services. The parent version of the WFI included the following eleven subscales: Youth and family team, Community-based services and supports, Parent and youth voice and choice, Cultural competence, Individualized services and supports, Strength-based services and supports, Natural supports, Continuation of care, Collaboration, Flexible funding, and Outcome-based services and supports. Analysis of parent-reported fidelity indicated that all five CTTs included in the QIA scored at or above the mean found in a national, multi-site study of wraparound fidelity (Bruns, Suter, Leverentz-Brady, & Burchard, 2004). Further, there were no significant differences in fidelity across teams.

QIA's Study Population and Sample

The target population for CTTs include youth who have a primary DSM-IV diagnosis of a major mental illness and demonstrate medical necessity for intensive case management services. CTT targets youth who are at high-risk for or who have experienced out-of-home placements and/or psychiatric hospitalization in the past year. Youth admitted to CTTs display a combination of risk factors including, but not limited to, substance use, homelessness, juvenile justice system involvement, crisis services utilization, inadequate supports, and failure to respond and/or comply with more traditional outpatient services. Youth admitted to CTTs are required to meet strict eligibility criteria, defined by AdvoCare's SSOC Guidelines. The behavioral health organizations review and approve youth prior to their admission to CTT services.

All youth admitted between April 1, 2002 and December 31, 2004 and their families were to be included in the QIA. Youth with stays less than 30 days were excluded. Over the course of the QIA, case managers from the five CTTs submitted information for 544 youth admissions. Of those, 19 youth admissions (3.5%) were excluded from all analyses because intake packets were never completed (i.e., neglected to include intake form with demographic information) or because the data collection protocol was violated (i.e., baseline data were collected too long after the initiation of

CTT services, defined as greater than 30 days after intake). An additional 12 cases were excluded because the length of stay was less than 30 days. At the end of the project, eleven more cases were excluded because the youth had not been discharged from CTT. Those youth had been admitted in 2004 or earlier, so their lengths of stay could be considered outliers. Thirty-two youth were admitted to CTT twice during the study period. One of those admissions was randomly selected for inclusion in the analyses. The resulting sample included 470 youth admissions to CTT.

Secondary Data Analysis Sample

This study used the AdvoCare dataset but excluded eight youth who did not have parent ratings of symptoms and/or functioning at intake. A few of these cases were lost when specific dependent measures were considered (symptoms or functioning), typically functioning (p. 2 of the measure).

Tables 2 and 3 present the demographics for the youth and their parents or caregivers. Other characteristics, many of which are considered risk factors (e.g., Hawkins, Catalano, & Miller, 1992; Werner, 1994), are discussed and presented later (see section on pile-up of stressors). The majority of the youth were Caucasian and in the custody of at least one of their biological parents at intake. About a two-dozen youth lived with other relatives at the time of intake, usually grandparents, even though a biological parent maintained custody. Nearly 1 of every 5 youth lived with relatives. Youth ranged in age from 4 to 19 with a mean age of 12.2 years. Boys outnumbered girls approximately 2 to 1. Only about half of the youth's primary caretakers were employed.

Roughly one quarter of caregivers received SSI/SSDI benefits and another quarter were unemployed.

The three most common youth diagnoses were ADHD, depression, and ODD/conduct disorders. Based on DSM-IV diagnoses and the categorization strategies used by Youngstrom (2003), youth were determined to have internalizing, externalizing or comorbid broadband diagnoses. Externalizing disorders included: disruptive behavior, ADHD, oppositional defiant, conduct, substance. Internalizing disorders included: depression, mood, anxiety, adjustment without disturbance of conduct, psychotic, and reactive attachment. Comorbidity was defined as having both internalizing and externalizing disorders or bipolar disorder. Youth who had multiple diagnoses within a broadband category (e.g., ADHD, OOD, and CD) were not defined as displaying comorbidity for purposes of this study. Forty-two percent of the youth had comorbid internalizing and externalizing disorders. About one quarter of the youth only had externalizing disorders, while one third only had internalizing.

Measures and Procedures

This section describes the data collection procedures and measures that operationalize each component of the conceptual model. Please refer to Appendix A for copies of the standardized measures that were used in the study.

Predisposing, Enabling, and Need

As reviewed in Chapter 2, researchers have investigated numerous demographic characteristics for their potential impact on youth and family outcome. Age and gender,

Table 2

Youth Demographics at Intake for Available Cases (N=462)

Variable	N	N (%) Missing [1]	Percentage / Mean (SD)	Range	Skew	Kurt
Team		0				
Team 1	25		5.4			
Team 2	34		7.4			
Team 3	109		23.6			
Team 4	171		37.0			
Team 5	126		26.6			
Age at intake	462	0	12.3 (3.34)	4.2 – 19.1	-0.35	-0.73
Gender		0				
Male	295		63.9			
Female	167		36.1			
Race		0				
African American	116		25.1			
Caucasian	333		72.2			
Other	13		2.8			
Diagnosis – Axis I [2]		0				
Bipolar	68		14.7			
ADHD	243		52.6			
ODD/Conduct	147		31.8			
Impulse	35		8.0			
Substance	24		5.2			
Depression	188		40.7			
Anxiety	37		7.9			
Adjustment/Mood	15		3.2			
Psychotic	25		5.4			
Reactive Attachment	7		1.5			
Other	17		3.8			
Diagnosis – Broadband		0				
Internalizing	154		33.3			
Externalizing	112		24.2			
Both	196		42.4			
Diagnosis – Axis II [2]	28		6.0			
Developmental	13		2.8			
Personality	1		0.2			
Mental Retardation	15		3.2			

[1] Combines case managers' endorsements of "don't know" with those left blank.

[2] Case managers could list up to four primary, secondary, and other diagnoses. V codes are not included here except for those indicating abuse.

Table 3

Family Demographics

Variable	N	N (%) Missing	Percentage / Mean (SD)	Range	Skew	Kurt
Youth Custody at Intake		3 (0.6)				
Both Bio. Parents	126		27.3			
Bio. Mother	200		43.3			
Bio. Father	30		6.5			
Grandparent	50		10.8			
Aunt/Uncle	13		2.8			
DCS	27		5.8			
Adoptive Parent	10		2.2			
Other	3		0.6			
Family Hx of Mental Illness		39 (8.4)				
No	144		31.2			
Yes	279		60.4			
Income of prime caretaker		21 (4.5)				
Unemployed	125		27.1			
Part-time	33		7.5			
Full-time	155		35.1			
Irregular	16		3.5			
Retired	8		1.7			
SSI/SSDI	104		22.5			

demographic variables that are frequently considered controlling or nuisance variables, are included in the mixed-effects analyses. Other characteristics used in the analyses included ethnicity and youth custody at intake. Social economic status was not considered because all youth were qualified for Medicaid and thus low income.

Need is often operationalized as symptom severity or by lack of functioning. It is a primary predictor of service use (Lambert et al., 1998). Initial levels impact the intercepts of youth growth curves but also may impact slope. For this study, need is defined as youth symptoms and functioning at intake.

Youth Symptoms and Functioning

The Ohio Problem, Functioning, and Satisfaction Scales (Ohio Scales) (Ogles, Lunnen, Gillespie, & Trout, 1995) were used to measure youth symptoms and functioning over time. The Ohio Scales assess multiple constructs across several informants in a rigorous yet practical way. The developers suggest the scales are useful for both outcome evaluation and clinical assessment (Ogles, Melendez, Davis, & Lunnen, 1999), but underscore that they are not diagnostic or screening tools. The scales were designed for longitudinal evaluations and include the items most commonly endorsed by youth and their parents (Ogles, Melendez, Davis, & Lunnen, 2000).

Parallel forms are used to collect ratings from case managers/therapists, parents/caregivers, and youth eleven and older. While all three forms were employed in AdvoCare's QIA, only the parent form contributed to this study.

The brief version includes two 20-item scales that assess youth symptom severity and functioning. Problem severity (symptoms) is rated on a 6-point scale ranging from 0 (not at all) to 5 (all of the time). Functioning is rated on a 5-point scale, ranging from 0 (extreme troubles) to 4 (doing very well). Scale scores are the summed totals across items. Higher symptom scores indicate greater youth psychiatric problems, while higher functioning scores indicate better youth functioning. The Technical Manual and User's Manual provide information on the development of the scales, reliability, validity, administration, interpretation, and comparative norms from community and clinical samples (Ogles et al., 1999; Ogles et al., 2000).

Although studies of the original long form (44 items) suggested good validity and reliability, the developers (Ogles et al., 2000) have conducted only cursory examinations of the psychometric properties of the short form. They have asserted good reliability and validity based on the psychometrics of the short form and on the overlap (i.e., correlations) between the long and short forms. In community and clinical samples, Ogles et al. (2000) found acceptable internal consistency (i.e., >.85). For the present sample, the symptom severity and the functioning scales from the Ohio Scales demonstrated high internal consistency (Cronbach alphas of .92 and .94, respectively).

Case managers interviewed parents at intake, discharge, and every 6 months during CTT services. As previously noted, some case managers elected to add assessments at 3-month intervals. Scales scores were calculated according the scoring procedures defined in the User's Manual. The descriptives for the symptom and functioning parent Ohio Scales by wave are displayed in Tables 4 and 5 respectively. Intake symptom scores are missing for 5.0% of the sample youth; functioning scores are missing for 5.7% of the youth.

Table 4

Descriptives of Youth Symptoms over Time

Variable	N	Mean	SD	Min	Max	Skew	Kurt
Intake	446	36.44	16.91	1	82	.28	-.39
3 Months	96	31.10	16.42	1	73	.16	-.63
6 Months	88	27.92	17.34	1	83	.78	.32
9 Months	15	22.53	16.75	3	54	.57	-.69
12 Months	25	29.20	17.02	5	71	.66	.13
Discharge	257	24.77	18.52	0	79	.66	-.49

Table 5

Descriptives of Youth Functioning over Time

Variable	N	Mean	SD	Min	Max	Skew	Kurt
Intake	443	40.55	14.60	0	80	-.05	-.22
3 Months	97	44.64	13.11	4	72	-.27	.50
6 Months	88	45.56	15.86	5	80	-.11	-.50
9 Months	15	45.13	18.62	7	74	-.25	-.22
12 Months	24	44.00	17.58	5	79	-.05	.22
Discharge	256	48.86	15.82	4	80	-.22	-.37

Pile-Up of Stressors

An index of stressors was created to measure pile-up from the diverse and complex issues that youth and their families experienced. Information about the stressors, displayed in Table 6, were gathered from the youth intake form and from the claims data provided by the BHOs. The Stressors Pile-Up Index was the sum of stressors reported by case managers for each youth and his/her family. The index was considered missing if more than two variables were absent. The descriptives for the index are displayed in Table 7 and the inter-item correlations in Table 8. Pile-up in the conceptual model is hypothesized to be a latent construct and the risks or stressors are considered to be causal indicators of that latent construct. Consequently, reliability of the index is not demonstrated by internal consistency. Furthermore, the strengths of the inter-item correlations are not meaningful in evaluating the index “because the correlations are explained for by factors outside the model” (Bollen & Lennox, 1991, p. 309).

Table 6

Youth and Family Stressors (N=462)

Variable	N	N (%) Missing[1]	Percentage / Mean (SD)
Abuse - history of sexual or physical abuse or neglect		13 (2.8)	
No	235		50.9
Yes	214		46.3
Comorbid Diagnosis – internalizing & externalizing		0	
No	266		57.6
Yes	196		42.4
Youth Substance Use		8 (1.7)	
No	303		65.6
Yes	151		32.7
DCS Placement – history of custody ever		10 (2.2)	
No	368		79.7
Yes	84		18.2
Out-of-home inpatient /residential services past 12 months		20 (4.3)	
No	362		78.4
Yes	80		17.3
Previous Contact with Police - ever arrested, charged		7 (1.5)	
No	256		55.5
Yes	199		43.1
School Problems - school suspensions or expulsions ever or school behavior problems in past 6 months		5 (1.1)	
No	151		32.7
Yes	306		66.2
Family History of Substance Abuse/Dependence		40 (8.7)	
No	253		54.8
Yes	169		36.6

[1] Combines case managers' endorsements of "don't know" with those left blank.

Table 7

Descriptives for Stressors Pile-Up Index

Index	N	Mean (SD)	Range	Skew	Kurt
Pile-Up	462	3.08 (1.75)	0 - 7	0.20	-0.80

Note. Pile-up calculated after missing values for the nine individual components were imputed.

Table 8

Pearson Correlations Among Items Contributing to the Stressors Pile-Up Index

Variable		IP/Res. Pre CTT	School Problems	Youth Substance Use	Abuse/ Neglect	Police Contact	Family Substance Disorder	Youth Comorbid Dx	Ever DCS Custody
IP/Residential pre CTT	r								
	(N)								
School Problems	r	.10*							
	(N)	(438)							
Youth Substance Use	r	.14**	.23**						
	(N)	(433)	(448)						
Abuse/Neglect	r	-.01	.00	.15**					
	(N)	(430)	(445)	(440)					
Police Contact	r	.19**	.29**	.48**	.04				
	(N)	(435)	(451)	(447)	(443)				
Family Substance Disorder	r	.06	-.03	.17**	.17*	.11*			
	(N)	(406)	(421)	(415)	(4160)	(418)			
Youth Comorbid Dx	r	.03	.11*	.09	.00	.06	.03		
	(N)	(442)	(457)	(452)	(449)	(455)	(424)		
Ever DCS Custody	r	-03	.05	.16**	.30**	.17**	.05	.05	
	(N)	(433)	(448)	(444)	(440)	(448)	(415)	(452)	

*p<.05, **p<.01.

Caregiver Perceptions

This study included two measures of caregiver perceptions that are hypothesized to have a potential impact on youth outcomes: caregiver strain and caregiver attitudes. The **Caregiver Strain Questionnaire** (CGSQ) developed at Vanderbilt (Brannan, Heflinger, & Bickman, 1994) was used to measure caregiver strain. The CGSQ is a frequently used measure of parent stress relating to caring for a child with mental illness. Information gathered from the CSQ can be used to guide treatment decisions as well as monitor service outcomes over time.

The CGSQ includes 21 items that assess caregiver strain in the 6 months prior to completing the questionnaire. Each item ranges from 1 (not at all) to 5 (very much). The survey provides a measure of global strain, as well as three subscales of caregiver strain. Objective Strain (OS) captures the observable disruptions in family and community life (e.g., interruption of personal time, lost work time, financial strain). Internalized Subjective Strain (ISS) describes the negative “internalized” feelings such as worry, guilt, and fatigue. Externalized Subjective Strain (ESS) captures the negative “externalized” feelings about the child such as anger, resentment, or embarrassment. Global Strain is the sum of the individual subscales and characterizes the total impact of the youth’s mental illness on the family. Although descriptives of the subscales are presented, only global strain is used in the analyses in order to limit the number of parameter estimates.

In previous research, the CGSQ has been found to have good reliability and validity. Confirmatory factor analysis supports the existence of three related dimensions of caregiver strain (Brannan, Heflinger, & Bickman, 1997). The three subscales have demonstrated adequate internal consistency, with alpha coefficients ranging from .73 to

.91 (Heflinger et al., 1998). For this study, scales were set to missing if the number of missing individual items exceeded authors' recommendations. All three subscales had acceptable internal consistency (Cronbach alphas of .92, .87, and .70 for the OS, ISS, and ESS scales, respectively), as did the Global Scale (Cronbach alpha=.93).

The CGSQ subscales have been found to correlate with measures of family functioning and caregiver distress, thus providing evidence of construct validity (Brannan et al., 1998). Also, the CGSQ has been shown to be predictive of service utilization above and beyond information provided by measures of child clinical and functional status (Foster, Saunders, & Summerfelt, 1996).

For this study, the Double ABCX model construct of perceptions includes caregiver strain. While this is consistent with positions taken by some researchers (e.g., Saloviita et al., 2003), others have considered caregiver strain an ultimate outcome of interest, and thus following under the construct of adaptation (e.g., Brannan et al., 2003; Heflinger et al., 1998). The researchers' ultimate outcome of interest (i.e., dependent variable) may drive the choice to specify caregiver strain as either assessing perceptions or adaptation. In a review of the literature, no study was located that included both caregiver strain and youth clinical treatment outcomes within the conceptual framework of the Double ABCX model. This study posits caregiver strain as a potential moderator of youth outcome, not as a mediator. The descriptives for caregiver strain at intake are shown in Table 9.

Table 9

Descriptives of Caregiver Strain at Intake

Scale	N (% Missing)	Mean	SD	Min	Max	Skew	Kurt
Objective strain	431 (6.7)	2.61	.97	1	5	.37	-.77
Externalized subjective	431 (6.7)	2.60	.80	1	5	.71	.27
Internalized subjective	431 (6.7)	3.59	.98	1	5	-.45	-.73
Global Strain	431 (6.7)	8.80	2.33	3.3	14.4	.10	-.65

Caregiver attitudes were measured by a subscale from the parent form of the Ohio Scales. The scale's four items assess the caregiver's: (1) satisfaction with the relationship with the child, (2) ability to deal with the child's problems (i.e., efficacy), (3) amount of current stress, and (4) optimism about the child's future (refer to Appendix A). According to the developers, the scale characterizes parents' feelings of "hopefulness" (p. 6, Ogles et al., 1999). Caregivers rate each item on a 6-point scale and the sum across the items is the scale score. With original scoring, lower scores indicate more hope; however, for this study, the scale was reverse-scored so that higher scores indicated greater hope.

The Attitudes scale from the short form is the same as the one used on the original long-form. Ogles et al. (2000) noted good reliability and validity for the scale. In this sample, acceptable internal consistency was established (Cronbach alpha of .78). The scale was set to missing if the number of missing items exceeded authors' recommendations. The descriptives for the scale at intake are shown in Table 10.

Table 10

Descriptives of Parent Attitudes (Hope) at Intake

Scale	N (% Missing)	Mean	SD	Min	Max	Skew	Kurt
Attitudes	446 (3.5)	13.26	4.14	4	24	.23	-.26

Caregiver Coping Related to Treatment: Parent Involvement

According to Heflinger et al. (1998), facets related to service utilization, such as amount of service and "family involvement in all aspects of the treatment process," characterize active family coping (p. 264). Monthly, case managers provided global ratings of the caregivers' abilities to manage their children's illnesses. The measure of parent involvement and its response options are displayed in Table 11.

Table 11

Monthly Global Rating of Caregiver Involvement in Treatment

Score	Label	Definition
6	Primary Management Role	Able to manage youth's illness for most part; utilizes staff and treatment centers as resources
5	Co-Case Manager Role	Able to work as an equal partner with staff in managing youth's illness
4	Sees Role in Service/Tx. as Secondary	Participates in managing illness, but mostly relies on staff to manage youth's illness
3	Problem Recognition/No Role	Recognizes need for treatment, but relies entirely on staff to manage youth's illness
2	No Problem Recognition/Compliant	Doesn't recognize need for youth's treatment, but is compliant with staff
1	No Problem Recognition/Resistant	Doesn't recognize need for youth's tx - Resists staff and youth's treatment

A similar scale was used in a state-mandated evaluation of intensive case management services for adults with severe and persistent mental illness in Denver, Colorado (Zahniser, McGuirk, McQuilken, Flaherty, & High, 1999). It was adapted for AdvoCare's QIA to reflect parent management of their children's illnesses as opposed to describing adult consumers' self-management. As previously mentioned, case managers received training about completion of the monthly tracking form that included this rating. The instructions for rating also were included on the tracking form (see Appendix A).

For this study, the last ratings (i.e., most recent) of parent involvement were used in the analyses. The frequencies are presented in Table 12. The mean rating of involvement was 4.5 (SD = 1.0). Sixty-nine cases (14.9%) were missing.

Table 12

Frequencies for Last Global Rating of Parent Involvement in Treatment

Variable	N	Percentage
Primary Management Role	66	14.3
Co-Case Manager Role	150	32.5
Sees Role in Service/Tx as Secondary	111	24.0
Problem Recognition/No Role	55	11.9
No Problem Recognition/Compliant	6	1.3
No Problem Recognition/Resistant	5	1.1

CTT Services

AdvoCare provided claims data on youth included in this study. However, records for 20 youth (4.3%) were missing. The data included commonly used billing codes for filing insurance claims (i.e., using UB92 and HCFA-1500 forms). Typically, inpatient services are billed using Uniform Billing revenue codes (1992 edition; UB92), whereas outpatient professional services provided by psychologists or case managers are billed using Healthcare Common Procedure Coding System (HCPCS) and Current Procedural Terminology, 4th edition (CPT-4), codes. This study used the claims data to determine if youth had received inpatient and/or residential services in the year prior to CTT admission and describe the services received by youth and their families while enrolled in CTT. Descriptive statistics were provided in Table 5 about the 82 youth who had inpatient and/or residential services prior to CTT admission. The remainder of this section describes services youth received while enrolled in CTT.

Consistent with previous research using Tennessee Medicaid data (Saunders & Heflinger, 2003; 2004), claims data were cleaned and analyzed using SAS. The BHOs supplied documents allowing CPT, HCPCS, and modifier codes to be grouped into meaningful service categories. This documentation also included crosswalks so that older proprietary codes could be interpreted. All possible services were grouped into eight categories as displayed in Table 13. Inpatient and residential services are not included as a possible category because youth who did move into these restrictive placements were discharged from CTT. In other words, youth could not receive both CTT and inpatient services simultaneously. Several youth did move back and forth between CTT and inpatient services. As previously mentioned, however, only one stay per youth was included in the dataset (randomly selected).

Length of stay (LOS) was calculated as the number of months between admission and discharge from CTT services. The distribution was somewhat positively

Table 13

Services Received During CTT Enrollment (N = 442)

Service Type	N Youth Received	% Received	Episodes of Care	Min	Max
Case Management	442	100	25,308	4	355
Intensive Outpatient/Partial	6	1.4	43	0	12
Individual Therapy	312	70.5	1,512	0	24
Family Therapy	214	48.4	868	0	32
Group Therapy	61	13.8	216	0	16
Medication Management	384	86.9	1,486	0	37
Mobile Crisis	59	13.3	120	0	7
Supported Living	4	1.0	7	0	4

skewed and leptokurtic as youth tended to have relatively shorter stays although some did have stays on CTT or over a year. Youth had stays of one to thirty months with a median of 5.3 months (m = 6.6).

Service diversity was defined as the sum of the different services received while enrolled in CTT. Youth received a median of three different service types, ranging from one to seven. All youth received case management services. Most youth also received medication management and individual therapy. About half participated in family therapy.

Contact frequency for each youth was determined by dividing his/her total number of service episodes by his/her LOS. The total number of contacts was defined as the sum of all service encounters across each youth enrolled in CTT. For the 442 youth included in the claims data, there were 29, 560 CTT encounters. Youth had a mean of 10.0 contacts/month (SD=2.4).

Data Analysis

Overview

This study involved a series of sequential steps in exploring the differential mental health outcomes of youth who had received CTT services. First, youth symptoms and functioning over time was described. Next, groups of youth who demonstrated clinical improvement were compared to those who did not. Then, examination of differential youth outcomes was extended by utilizing mixed-effects modeling to investigate the study's research questions. Finally, threats to the findings involving patterns of data collection and missing data were explored.

Power Analysis

A between-group power analysis (Diggle, Liang, & Zeger, 1994) was conducted with N = 149 youth assessed on three occasions. The cross-wave correlation for the Ohio Scales symptom scale was estimated as r = .36 (based on this sample's correlation of intake and 6-month ratings). The functioning scale was estimated as r = .45. The smaller correlation was used in the power analysis. The results suggested that the study has 80% power to detect an effect size of .25 points per month, which is equivalent to a Cohen's d of .30 standard deviations between groups at the endpoint. In other words, if we compared low-stress and high-stress cases on their mental health outcome, we would detect a difference of .30 SDs (or more) at the end.

Description of Youth Outcome: Step I

The first step was to plot youth symptoms and functioning over time so that patterns of change could be inspected visually. This step was important, as multi-level modeling explores the significance of linear change over time. If different patterns are observed (e.g., curvilinear), nonlinear alternatives can optionally be included in the mixed-effects models.

Characteristics of youth and their families were contrasted based on group membership defined by whether youth demonstrated clinical improvement. Since simple change, even if statistically significant, does not equate to clinical significance, a more meaningful assignment to groups was desired. Following the recommendations of Ogles et al. (1999), the improved and unimproved groups were constructed based on the methods proposed Jacobson and colleagues (e.g., Jacobson, Roberts, Berns, & McGlinchey, 1999; Jacobson & Truax, 1991). These methods define practical significance when the difference exceeds a threshold, or Reliable Change Index (RCI = 1.96). The intent is to establish the magnitude of change in the outcome variable that minimizes measurement error or chance as an alternative explanation of the observed improvement. Based on their sample data, Ogles et al. (1999) suggested clinically significant change in parent-rated youth symptoms to be a decrease of 10 or more points, and clinically significant change in functioning to be an increase of 8 or more points.

A consequence of dichotomizing scores by improved-unimproved is a loss of statistical power (Cohen, 1983). In this study, loss in power is magnified by a loss of data because differences scores could not be calculated for youth with only one assessment. Use of difference scores also fail to account for patterns of change over time, thus the amount of change can be unreliable (Diggle et al., 1994; Rogosa, Brandt, & Zimowski, 1982). Although some researchers have argued vehemently against using pre-post measures of change (e.g., Cronbach & Furby, 1970), Lambert et al. (1996) demonstrated that, with four waves of data from the Fort Bragg dataset (Bickman, Gutherie, Foster, Lambert, Summerfelt, Breda, & Heflinger, 1995), use of difference scores, residuals, and slopes (mixed models, see the next section) yielded essentially equivalent findings. Given relatively few repeated measurements in this study, group comparisons offer an initial and straightforward exploration of the data.

Three hundred and six cases had two or more data collection points with a mean of three waves (see Table 14). One hundred and sixty-four cases had only one data collection point not included in the comparisons. (Note that these observations were including in the mixed-effects analyses – see Step 2.) The difference score was defined as the intake symptoms or functioning score minus the last available score. Differences in group proportions or means were tested for significant differences.

Table 14

Ohio Scale Assessments by Wave

Waves	N	Percentage
1	164	35.5
2	184	39.8
3	74	16.0
4	26	5.6
5	10	2.2
6	4	.9
Total	462	100.00

Testing the Specific Aims with Multi-Level Models: Step 2

Longitudinal data, particularly involving individuals nested within contexts, are best analyzed with specialized analytical techniques (Luke, 2004). Ignoring context assumes that processes leading to change – including treatment – work the same regardless of context (Luke, 2004). Further, correlated errors result from repeated assessments over time and from individuals belonging to the same context (e.g., team, classroom, family, school) thus violating multiple regression assumptions (Gibbons et al., 1993; Luke, 2004).

Multi-level models, also known as hierarchical linear models (Bryk & Raudenbush, 1992), random regression (Gibbons et al., 1993), and mixed-effects models (Luke, 2004), can accommodate correlated errors to predict a dependent measures with predictors across more than one level. In fact, the modeling of error variance increases statistical power (Singer & Willett, 2003). Mixed models address at least two questions of change (Singer & Willett, 2003). The objective of level-1 analysis is to describe how individuals change over time. The models can test the significance of linear change over time as well as other patterns of change (e.g., curvilinear). The objective of level-2 analysis is to describe how change over time varies across individuals. If individuals are nested within settings, the objective of level-3 analysis is to explain variance within and between those settings (e.g., teams, families, teachers, classrooms).

Mixed modeling accommodates characteristics of this dataset that are common to most longitudinal studies, especially real-world datasets. Mixed-models can accommodate time-unstructured and unbalanced data that results from attrition and missing data (Singer & Willett, 2003). In other words, the timing of data collection points can vary across individuals, as can the total number of data collection points. Estimation of the slope takes into account the completeness of the data, giving more weight to the cases with more complete data (Gibbons et al., 1993). Inclusion of subjects with only one wave improves the precision of the estimate of the intercept but not the slope (W. Lambert/S. Schilling, personal communication, April 17, 2006).

Another advantage of mixed models is that they can accommodate both fixed effects and time-varying covariates. Fixed effects are those characteristics that do not change over time such as gender, race, and treatment team. In contrast, time-varying covariates include variables that may fluctuate over time.

This study relies on a series of mixed models to explore whether youth symptoms and functioning are related to: (1) youth and family predisposing and enabling characteristics, (2) pile-up of stressors, (3) parent involvement in treatment, and (4) characteristics of service delivery. SAS PROC MIXED was used for the analyses. It is widely-used and accepted for conducting mixed-effects analyses (Little, Milliken, Stroup, & Wolfinger, 1996; Singer & Willett, 2003)

The base model was built incrementally, starting with unconditional means models and then progressing to unconditional growth models (cf. Kuke, 2004; Singer & Willett, 2003). The unconditional means model estimates the within- and between-person variance components; whereas, the unconditional growth model examines the scatter of data around individuals' linear growth curves by introducing time as a covariate. This process included visual inspection of youth outcome data over time to guide decisions about how to most appropriately estimate the shape of the population growth curve.

After the basic model was finalized, five sets of covariates were added individually to investigate the study's research questions. Table 15 summarizes the models that were tested for each youth outcome, parent-reported symptoms and functioning. In defining each set, care was taken to limit the number of terms (parameters) included to lessen risks of overfitting. Harrell (2001) recommended a minimum of 20 cases per predictor variable. Summary variables were used when possible (e.g., index of stressors, ethnicity captured as minority status, etc.), and interactions were entered when the literature or theory strongly supported its inclusion. Each continuous predictor variable was centered on its grand mean and left in natural units to facilitate interpretation of the output. One continuous variable, service diversity, was recoded to have a meaningful zero. Because all youth received case management, SRVSDIV was coded as 0. Values greater than 0 indicated greater service diversity. Youth with SRVSDIV=0 received only case management. Finally, age and gender were maintained as controlling variables after finding significant main effects for Model 1. Age also was significantly correlated with several of the covariates further justifying its inclusion.

Missing Data

The results, generalizability, and implications of a study can be severely biased by missing data. "Missing data" may describe several issues. First, information about certain variables may be missing. Although some missing items may have been accidentally skipped, others may have been left blank because the respondent did not

Table 15

Summary of Mixed Models

	Base Model	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	x	x	x	x	x	x
Time	x	x	x	x	x	x
Age		x	x	x	x	x
Age*Time		x				
Gender		x	x	x	x	x
Gender*Time		x				
Minority Race		x				
Custody		x				
Index of Stressors			x			x
Stressors*Time			x			x
Global Caregiver Strain				x		x
Caregiver Strain*Time				x		x
Parent Attitudes				x		
Attitudes*Time				x		
Length of Stay					x	
Frequency Contacts/Month					x	
Frequency*Time					x	
Service Diversity					x	
Diversity*Time					x	
Team					x	
Parent Involvement						x
Involvement*Time						x
Stressors*Involvement*Time						x
Caregiver Strain*Involvement*Time						x

Note: Each model was tested for each of the dependent variables, symptoms and functioning.

provide an answer. According to Harrell (2001), if the proportion of missing values is <=0.05, solutions using different methods of imputation will differ very little. He recommended that customized prediction models (e.g., maximum likelihood, expectation-maximization, multiple imputation) be used to impute missing values when the proportions of missing range between 0.05 and 0.15.

In this study, missing data for predictor variables were handled according to current best practices (e.g., Harrell, 2001). Most of the predictor variables had less than 5% missing. Several variables (caregiver strain, attitudes) had 5-8% missing. One variable, parent involvement, was missing for 15.1%. The Missing Value Analysis add-on module available for SPSS was used to impute values based on expectation-maximization (EM).

Another type of missing, especially problematic in longitudinal studies, relates to failure to complete entire assessments. For example, case managers may skip a parent interview or the parent may refuse to participate. The implications of nonresponse can be serious if individuals with complete data differ systematically from those with incomplete data (Foster & Bickman, 1996; Harrell, 2001). Dealing with missing waves or assessments is more complex. As previously discussed, mixed models can handle missing data when data are unbalanced and/or missing at random (MAR). The major problem arises when missingness is related to unobserved determinants of the outcome or the dependent variable, especially unobserved outcomes (Shen & Weissfeld, 2005). In this case, data are missing not at random (MNAR). Difficulty arises because it is not possible to distinguish MAR from MNAR based on observed data; thus, a conservative approach is to treat the data as MNAR (Shen & Weissfeld, 2005). Although a number of methods have been proposed to detect potential problems with attrition (e.g., Verbeek & Nijman, 1992), Foster and Bickman (1996) pointed out that these do not correct problems that are found.

In this study, groups of youth were contrasted in meaningful ways to address problems of unbalanced and/or missing data. Higher proportions of significant differences between groups suggests that missing data are MNAR. In addition, pattern-mixture modeling, based on a likelihood method that relaxes the MAR assumptions, was used to test the significance of missing data patterns. When significant, the technique can corrects for the resulting biases. Pattern-mixture models (PMM) divide the participants into groups based on their missing-data patterns, and then, use the resulting variable as a covariate in subsequent model tests (Hedeker & Gibbons, 1997). If the pattern-mixture variable is significant, different models are developed of each level of that PMM variable and the marginal distribution of the outcome is based on a weighted sum across each level of the PMM variable (Shen & Weissfeld, 2005).

The first step in applying a pattern-mixture approach was to divide the participants into groups based on their missing data pattern. For this study, a simple description of data “completeness” was chosen, following an example given by Hedeker and Gibbons (1997). Youth were divided in two groups: (1) those with parent-completed discharge assessments, and (2) those whose discharge assessments were missing. Given the relatively short length of stay (median of 5.3 months), the majority of youth had only one or two data collection assessments. However, regardless of length of stay, all youth included in the study, according to the protocol, should have had both intake and discharge assessments. Thus, not having a parent report of youth status at discharge could be argued to suggest “dropout.” Forty-four percent of the youth were missing caregiver Ohio Scales at discharge, and thus, received a value of 0 on the PMM variable.

The next step was to enter the PMM variable into each mixed-effect model as a main effect and as interactions with time. A significant main effect indicates that groups of youth defined by the PPM variable differ on the Time 0 value of the outcome variable of interest (i.e., intercept). A significant interaction with time suggests that missingness impacts outcomes (i.e., slope). This approach was applied after the initial tests of the five sets of covariates designed to explore the research questions.

CHAPTER V

RESULTS

Description of Youth Clinical Outcome

Change Over Time

Figures 3 and 4 present scatterplots of the caregivers' ratings of youth symptoms and functioning over time. Each figure includes a line showing the mean ratings over time (SPSS FITLINE subcommand to include a local linear regression Epanechnikov smoother). The plots clearly show variability in parent ratings and suggest that symptoms decreased and functioning increased over time. The regression lines show steeper slopes initially followed by leveling off periods. The shape of the curves after about 12 to 15 months were given little consideration as they are impacted by few and extreme cases and well past the median of 5.3 months. Patterns of change for symptoms and functioning were similar but inversely related. For the sample, they are strongly but negatively correlated, $\underline{r}(921) = -.64$, $\underline{p}<.001$.

To explore individual patterns of change in outcomes over time, 20 cases with two or more assessments were randomly selected (cf. Singer & Willett, 2003). These cases are shown in Figures 5 and 6. Plots from Figure 5, for example, suggest that 11 of the 20 youth demonstrated rapid improvement, 5 gradual improvement, one no change, and 3 a worsening of symptoms. The graphs of individual youth outcomes also suggest relatively rapid improvement early followed by a rather flat growth curve.

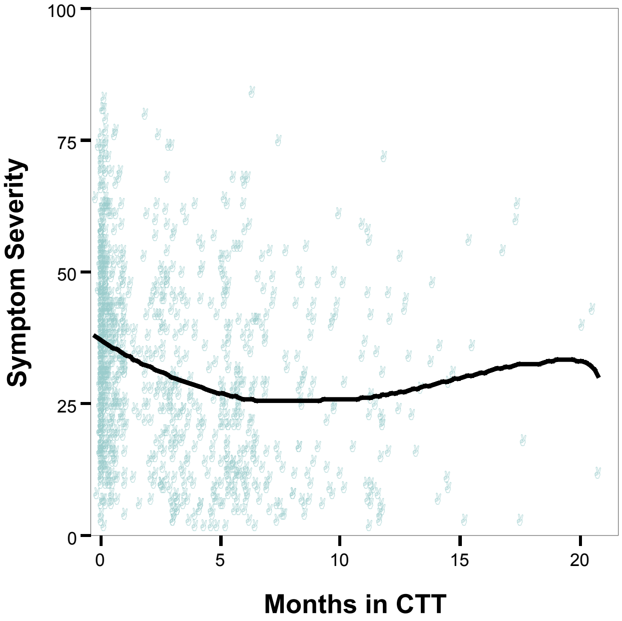

Figure 3. Scatterplot of CTT Cases Over Time for Parent Ratings of Symptoms

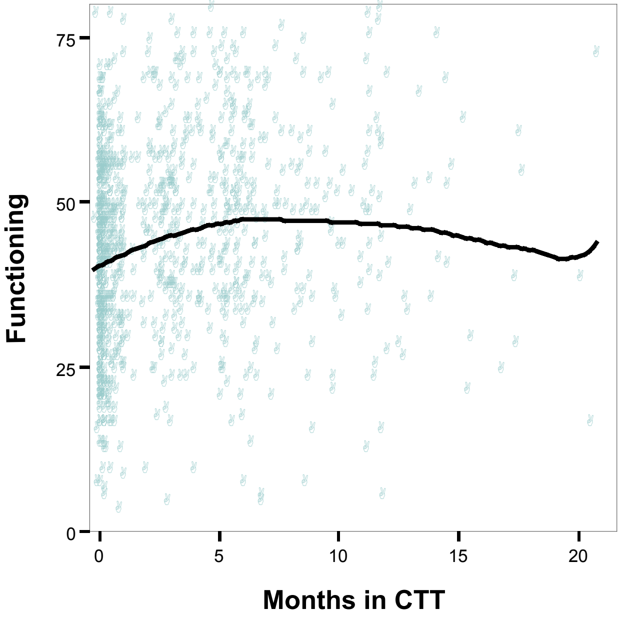

Figure 4. Scatterplot of CTT Cases Over Time for Parent Ratings of Functioning

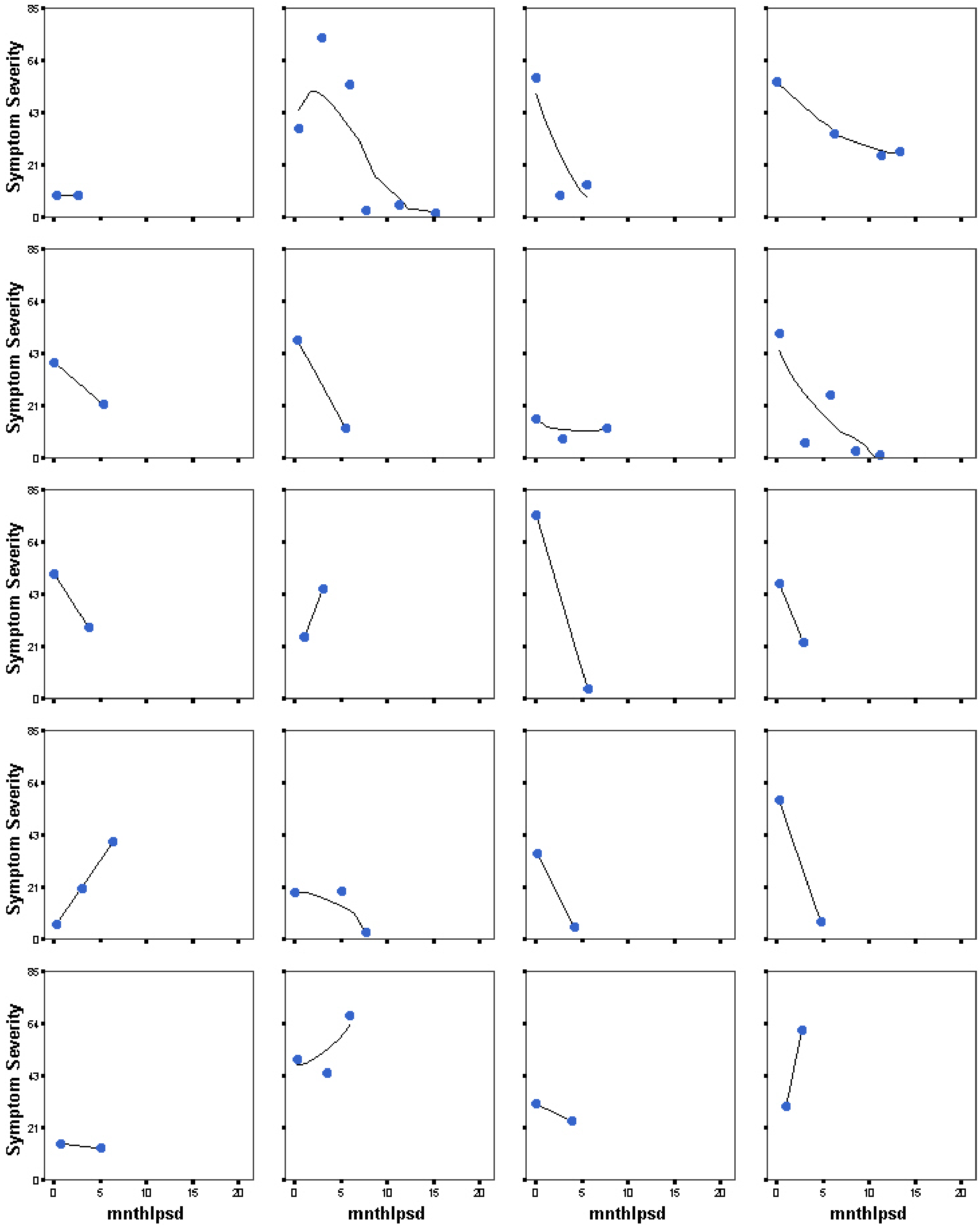

Figure 5. Twenty Randomly Selected Cases: Parent Ratings of Symptoms [1]

[1] Higher scores indicate greater symptom severity.

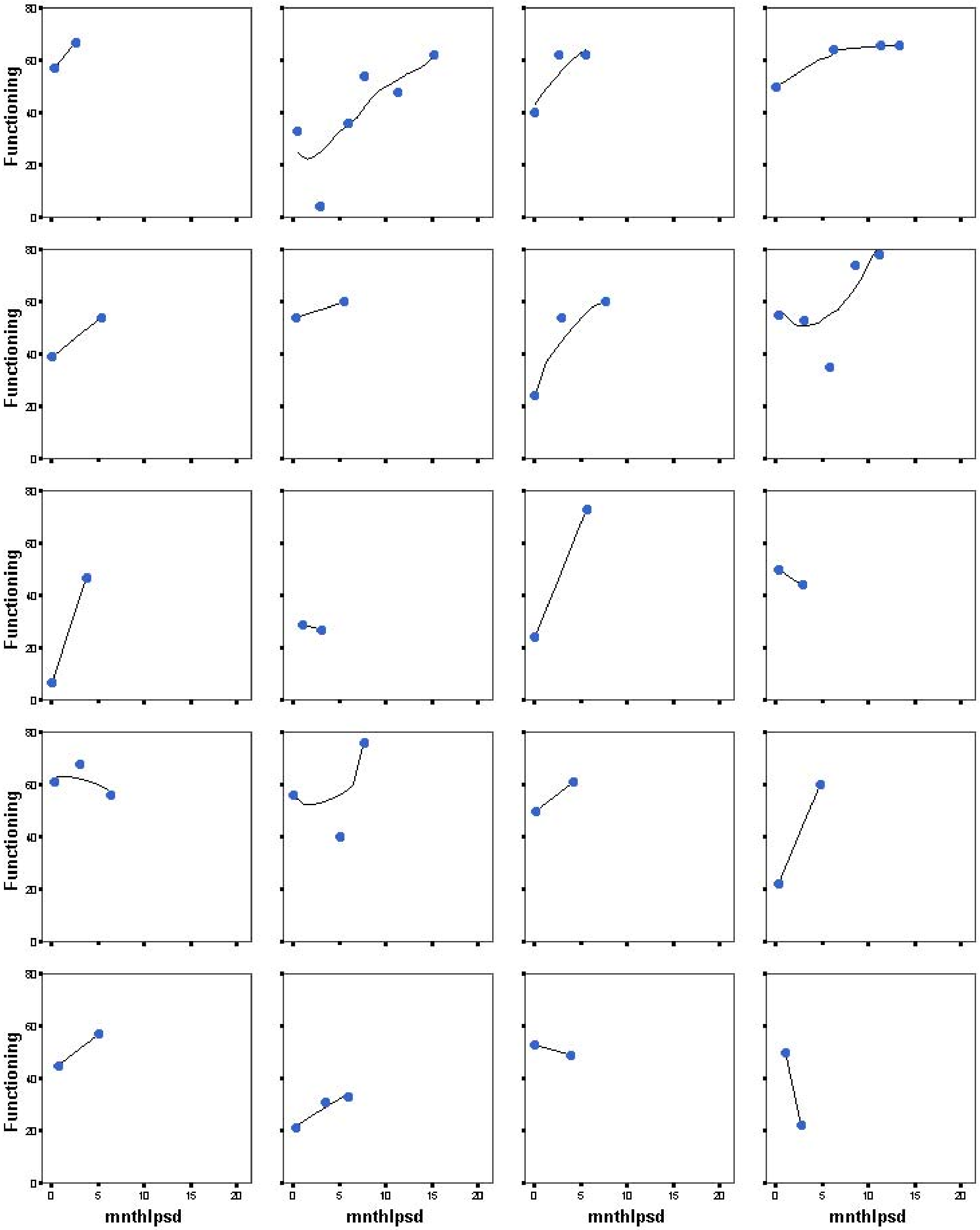

Figure 6. Twenty Randomly Selected Cases: Parent Ratings of Functioning [1]

[1] Same 20 youth as included in Figure 5. Higher scores indicate better functioning.

Together, this information has implications for the development of the base mixed-effects models. First, change over time does not appear to be adequately described by a simple linear term for either mental health outcome. The subsequent approach to time is described later in this chapter. Second, the high correlation between symptoms and functioning implies that it may be possible to develop a single base model that describes both dependent variables.

Differences Across Youth With and Without Significant Clinical Improvement

Information provided by the Ohio Scales User's Manual was used to assign youth to one of two groups: those who showed clinical improvement and those who did not. A decrease of 10 or more points was defined as clinically significant for parent-reported youth symptoms and an increase of 8 or more points was defined as clinically significant for functioning. The difference scores were calculated as the last symptom or functioning score minus the score at intake. Difference scores could not be calculated for 39% of the sample because those youth had with only one assessment.

The results of the contrasts between groups (improved versus not) are displayed in Tables 16 and 17. Over time, youth symptoms decreased by a mean of 11.4 points (SD= 20.1). Fifty-two percent demonstrated clinically significant decreases in parent-reported symptom scores. The two groups demonstrated differences in youth custody, age, symptoms at intake, and parent attitudes. Younger youth were more likely to show improvement, $\underline{t}$ (286) = 2.5, $\underline{p}$<.05. Proportions of youth demonstrating improvement were highest when both biological parents had custody and were lowest when youth were in State custody or an adoptive home. Interestingly, youth whose parents had less hope

Table 16

Comparison of Youth With and Without Symptom Improvement and Their Caregivers

	No Clinical Improvement		Clinical Improvement		
Variable	n	% or Mean (SD)	n	% or Mean (SD)	p
Team					
Team 1	4	57.1	3	42.9	ns
Team 2	8	57.1	6	42.9	
Team 3	27	46.6	31	53.4	
Team 4	58	44.3	73	55.7	
Team 5	40	51.3	38	48.7	
Gender					
Male	83	46.9	94	53.1	ns
Female	54	47.6	57	51.4	
Race					
Caucasian	95	47.0	107	53.0	ns
Minority	42	48.8	44	51.2	
Custody					
Both Biological Parents	28	34.1	54	65.9	<.05
One Biological Parent	65	48.9	68	51.1	
Relative	25	56.8	19	43.2	
DCS or Adoptive Family	19	65.5	10	34.5	
Age	137	12.6 (3.5)	151	11.6 (3.3)	<.05
Symptoms at Intake	137	29.9 (15.2)	151	43.5 (16.1)	<.001
Functioning at Intake	135	41.3 (13.7)	150	38.1 (14.0)	ns
Pile-up of Stressors	137	3.8 (1.8)	151	3.5 (1.8)	ns
Global Caregiver Strain	137	8.5 (2.3)	151	8.9 (2.2)	ns
Attitudes at Intake	137	12.3 (4.3)	151	11.2 (3.9)	<.05
Parent Involvement in Tx	137	4.6 (.9)	151	4.7 (1.0)	ns
LOS	137	7.0 (4.8)	151	7.6 (5.1)	ns
Contact Frequency	137	10.4(2.4)	151	10.2 (2.1)	ns
Service Diversity	137	3.5 (1.1)	151	3.5 (1.0)	ns

Table 17

Comparison Youth With and Without Functioning Improvement and Their Caregivers

	No Clinical Improvement		Clinical Improvement		
Variable	n	% or Mean (SD)	n	% or Mean (SD)	p
Team					
Team 1	2	33.3	4	66.7	ns
Team 2	8	57.1	6	42.9	
Team 3	25	43.1	33	56.9	
Team 4	57	43.5	74	56.5	
Team 5	47	62.7	28	37.3	
Gender					
Male	86	49.4	88	50.6	ns
Female	53	48.2	57	51.8	
Race					
Caucasian	93	46.5	107	53.5	ns
Minority	46	54.8	38	45.2	
Custody					
Both Biological Parents	43	51.8	40	48.2	ns
One Biological Parent	61	46.9	69	53.1	
Relative	24	54.5	20	45.5	
DCS or Adoptive Family	11	40.7	16	59.3	
Age	139	12.3 (3. 5)	145	11.9 (3.3)	ns
Symptoms at Intake	139	35.0 (16.4)	145	39.2 (17.8)	<.05
Functioning at Intake	139	44.4 (13.1)	145	34.5 (13.0)	<.001
Pile-up of Stressors	139	3.6 (1.8)	145	3.6 (1.7)	ns
Global Caregiver Strain	139	8.6 (2.4)	145	8.9 (2.3)	ns
Attitudes at Intake	139	12.1 (4.1)	145	11.4 (4.1)	ns
Parent Involvement in Tx	139	4.5 (.96)	145	4.7 (.94)	<.05
LOS	139	7.0 (4.9)	145	7.6 (4.9)	ns
Contact Frequency	139	10.3 (2.0)	145	10.4 (2.4)	ns
Service Diversity	139	3.5 (1.1)	145	3.5 (1.0)	ns

were more likely to demonstrate improvement, t (286) = 2.4, p<.05. Finally, youth with higher symptom scores at intake were more likely to show improvement, t (286) = -7.4, p<.001. This finding is likely related to regression to the mean – that is, upon repeated assessment, youth with severe scores at intake tend to have more moderate scores. Mixed-effects modeling is useful as it controls for initial severity or between-person variation in the dependent variable at intake.

Over time, youth functioning increased by a mean of 8.8 points (SD=16.4). Fifty-one percent experienced clinically significant improvement in functioning. Youth with higher symptom and lower functioning scores at intake more often demonstrated improvement in functioning, t (282) = -2.1, p<.05; (t (282) = 6.4, p<.001. Again, this result is likely associated with regression to the mean. Finally, greater caregiver involvement in treatment was associated with clinical improvement, t (282) = -2.0, p<.05.

Mixed-Effects Analyses

The mixed-effects analyses were designed to explore specific research questions related to the study's conceptual framework presented in Chapter 3. Each question was intended to isolate and explore different, but complimentary pieces of the larger framework.

Table 18 displays the Pearson correlations among the continuous variables used as covariates across the predictor sets. The Stressors Pile-up Index was positively correlated with youth age, with older youth having more stressors. Global caregiver strain was negatively correlated with parent attitudes/hope and parent involvement in treatment

Table 18

Pearson Correlations Among Continuous Predictor Variables (N=462)

Variable	Age	Pile-Up	GS	Attitudes	Involvement	LOS	Srvc. Diversity	Frequency
Youth Age								
Pile-Up of Stressors	.46**							
Global Strain (GS)	-.06	.08						
Caregiver Attitudes	.06	-.07	-.52**					
Parent Involvement	-.06	-.07	-.16**	.17**				
Length of Stay (LOS)	-.14**	.04	.02	.09*	.22**			
Service Diversity	-.01	-.04	.13**	-.07	.07	.32**		
Contact Frequency/Month	.06	-.06	.11*	-.07	.08	.07	.34**	

*p<.05; **p<.01 (2-tailed).

services. Thus, parents who reported high levels of caregiver strain also reported less hope on the Ohio scale and tended to be less involved in their children's services. Longer lengths of stay were associated with younger age and caregivers with more positive attitudes and greater involvement in services.

While the correlation matrix provides an overall feel of the relationship among these variables, the mixed-effects analyses assessed their combined impact on youth mental health outcomes. Although fitting "full" models, with all constructs from the conceptual model, seems appealing, they were not useful for investigating the specific research questions. Moreover, their size makes the reference group too restrictive for interpretation (each β is interpreted individually with all others set to zero). The full models required 42 significant tests thus requiring too many parameter estimates given the number of youth and repeated assessments (e.g., Harrell, 2001). Thus, the results are not presented in the main text but are included in the Appendix B.

Base Model

The base model was built incrementally as described in Chapter 4. The process began with the evaluation of unconditional means models (Models A and B) and then progressed to assessment of unconditional growth models (C and D) that incorporated two alternative definitions of time (cf. Kuke, 2004; Singer & Willett, 2003, pp. 92-101). The models are summarized in Tables 19 and Table 20.

The base model (A) started with a 2-level unconditional means model that partitioned the variance in outcome across youth, without regard to time. That model specified that the intercept varied across youth who were nested in teams. The intraclass

Table 19

Summary of Sequential Models in Arriving at a Base Model for Symptoms (N=462)

	Model A Uncond. Means Individuals	Model B Uncond. Means Individuals &Teams	Model C Uncond. Growth Linear	Model D Uncond. Growth Piecewise
Fixed Effects Initial Status	31.71*** (0.71)	32.17*** (1.28)	34.84*** (0.78)	36.16*** (0.80)
Rate of Change Intercept (Time Early)			-1.21*** (0.13)	-2.24*** (0.21)
Time Late				2.59*** (0.42)
Variance Components				
Level 1 Within-person	214.31*** (13.54)	215.4*** (13.66)	181.34*** (11.57)	171.25*** (10.99)
Level 2 In initial status	111.10*** (15.98)	105.18*** (15.87)	129.09*** (15.94)	130.14*** (15.71)
Level 3 In initial status		4.66 (4.94)		

*p<.05; **p<.01; ***p<.001.

correlation coefficient, ρ, indicated that 34% of the variation in symptoms and 38% of the variation in functioning was attributable to differences between youth at intake. Next, a 3-level unconditional means model (B) that partitioned the outcome variation across youth and teams was assessed. Teams accounted for very little variation at intake (1.4% for symptoms and 1.9% for functioning). In other words, youth at intake did not vary across teams. The covariance parameter estimates were insignificant (p=0.17 and p=0.18 for symptoms and functioning models, respectively). Because it was more parsimonious, the 2-level model was adopted.

Table 20

Summary of Sequential Models in Arriving at a Base Model for Functioning (N=462)

	Model A Uncond. Means Individuals	Model B Uncond. Means Individuals &Teams	Model C Uncond. Growth Linear	Model D Uncond. Growth Piecewise
Fixed Effects Initial Status	43.83*** (0.61)	43.12*** (1.19)	41.78*** (0.68)	40.93*** (0.70)
Rate of Change Intercept (Time Early)			0.81*** (0.13)	1.50*** (0.18)
Time Late				-1.73*** (0.40)
Variance Components				
Level 1 Within-person	144.97*** (9.21)	145.55*** (9.27)	129.06*** (8.30)	124.52*** (8.05)
Level 2 In initial status	90.48*** (11.85)	86.34*** (11.75)	101.28*** (12.08)	101.85*** (12.00)
Level 3 In initial status		4.43 (4.80)		

*p<.05; **p<.01; ***p<.001.

Next, simple linear time was introduced creating an unconditional growth model (C). Time was significant for symptoms and functioning models, explaining 15% and 11% of the within-person variation in the outcomes, respectively. However, as mentioned in the opening of this chapter, visual inspection of the scatterplots suggested that simple linear time was not the best way to model change in mental health outcomes over time. Although higher order polynomials can be used, some patterns of change cannot be modeled by polynomials of any order. Most commonly, this happens when the dependent variable increases or decreases rapidly and then levels off, as seen in this study.

Piecewise models, also known as linear splines, are appropriate in such cases (Fitzmaurice, Laird, & Ware, 2004). Piecewise models have been shown to model nonlinear change as well or better than those using polynomials and are more easily interpreted (Bickman et al. 2000; Lambert, Wahler, Andrade, & Bickman, 2001).

A two-segment piecewise approach was adopted for thus study, allowing the slopes of each time segment, Early and Late, to differ. A critical aspect of applying piecewise models is designating the "hinges" or time points that distinguish between the time segments. Based on both visual inspection of scatterplots and the timing of the first follow-up assessment required by AdvoCare's QIA protocol (i.e., 6 months), the hinge was defined as 6 months following intake to CTT. The SAS code was modified based on that suggested by Fitzmaurice et al. (2004). Going from simple linear to piecewise time resulted in a greater proportion of within person variance explained over time for both outcomes. That is, piecewise time accounted for 20% and 14% of the within-person variation in the symptoms and functioning, respectively.

The resulting base model (D), was a 2-level random intercept piecewise model. These models predict youth outcomes, symptoms and functioning, over time without including any other predictors. Figures 7 and 8 show the mean observed and predicted outcome scores over time. The predicted symptom score at intake was 36. Scores decreased 2.24 points/month during Early Time (0- 6 months). During Late Time (7-21 months), the slope leveled off, actually increasing 0.35 points/month. The predicted functioning score at intake was 41. Scores increased 1.5 points/month during Early Time. The slope during Late Time demonstrated a relapse in functioning gains, decreasing 0.28 points/month.

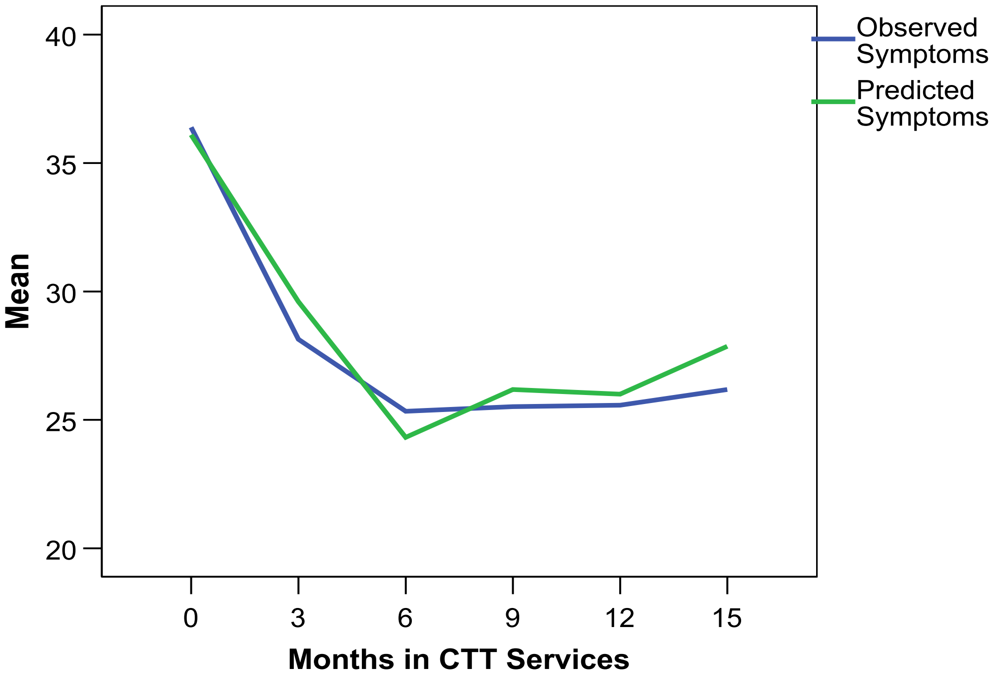

Figure 7. Base Model Observed and Predicted Scores for Symptoms

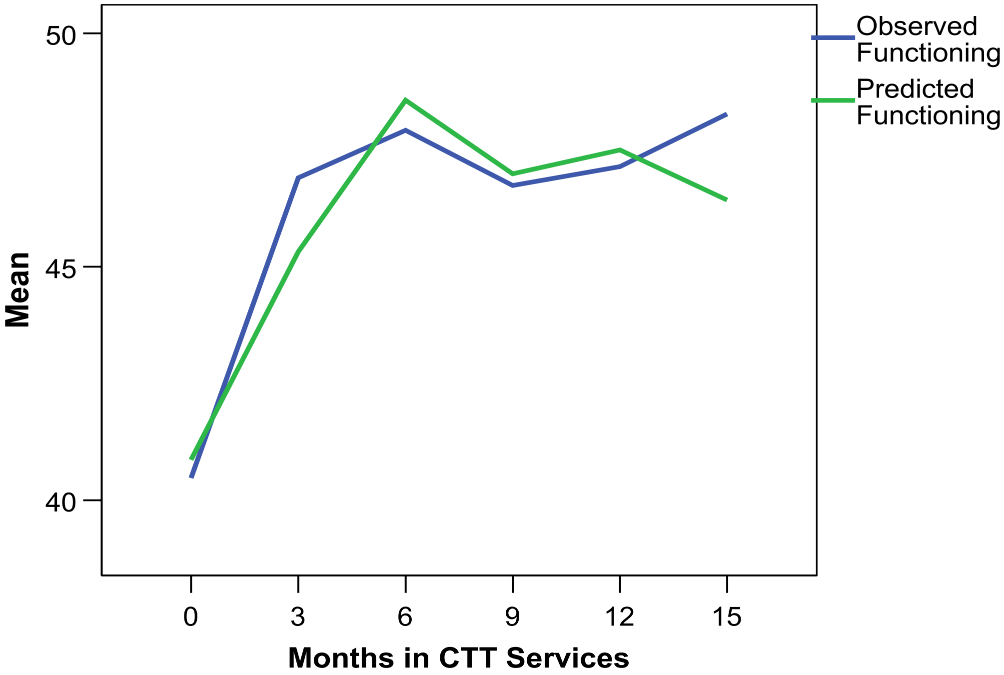

Figure 8. Base Model Observed and Predicted Scores for Functioning

Adding Fixed Effects to Investigate the Research Questions

After the basic model was established, each of the five sets of covariates were added to the base model individually to investigate the study's research questions. The sets of predictors for each model are summarized in Table 15 in Chapter 4. In the following sections, the results of fitting each model are discussed and summary tables presented. The symptoms and functioning models tended to yield similar conclusions, although more often, the functioning models resulted in fewer significant parameters. Summary tables not presented in the main text are included in Appendix B.

The following description serves as an example of how the SPSS output was interpreted, using Table 21 as an example. The intercept is the symptoms or functioning score at intake for the reference group. The reference group includes youth whose values on each of the covariates is 0 (given that continuous variables have been centered on the mean or have a meaningful "zero" and that categorical variables have one level coded as 0). For example, from Table 21, Caucasian boys with a mean age of 12.2 years and in the custody of both biological parents have a predicted symptoms score of 36 at intake.

Estimates (β) for fixed effects relate to scores at intake (Time 0). The coefficient describes what happens to the intercept when a specific variable is considered. Youth intake scores do not vary across youth when the term is insignificant. If a fixed effect is significant, then the intercept changes at different levels of that variable with all other effects held constant. For instance, the estimate for age was significant; thus, for the reference group, the predicted intake score is 1.4 points lower (less severe) for each year older the youth is above the mean of 12.2 years. The intake symptom score for a 15-year old boy is about 4 points less than a 12-year old.

Estimates (β) for effects involving time describe slopes, or mental health outcomes. Estimates for the piecewise slopes, Early Time and Late Time, explain change in scores over time before considering the effects of the covariates. Early Time is the slope for youth in the reference group from Time 0 (intake) to six months. Late Time is the slope for those youth from month 7 to 21. The late outcome slope is calculated by combining estimates for Early and Late Time. The terms from the base model, the intercept and both piecewise slopes, were significant for all models.

Estimates (β) for covariates interacted with piecewise time test whether mental health outcome varies by levels of the covariate. In Table 21, none of these interactions are significant, and thus age, for example, does not impact early or late outcome. However, in Table 22, the interactions of the Stressors Index with both Early and Late Time were significant. Consequently, the interpretation is that early and late youth outcomes are significantly impacted by the pile-up of stressors.

Question 1: Do youth and family predisposing and enabling factors predict outcome?

The results for the model predicting symptoms are illustrated in Table 21 (see Appendix B for the functioning table). As previously mentioned, older youth had less severe scores at intake, i.e., fewer symptoms and higher functioning. Gender did not relate to intake scores for symptom, but girls had functioning scores that were approximately 5 points higher at intake than boys. However, neither gender nor age was related to mental health outcomes. Ethnicity did not predict intake scores. Youth in DCS custody and in adoptive families at intake had symptom scores that were nearly 8

Table 21

Modeling Youth Symptoms: Predisposing and Enabling Factors

Effect	β	SE(β)	Pr > |t|	Interpretation
Intercept	37.47	1.61	<.001	Symptom score at intake for reference group.[1]
Early Time	-2.66	0.41	<.001	Scores for reference group decreased 2.66 pts/month.
Late Time	3.39	0.89	<.001	Slope changed 3.39 pts/month. Outcome was an increase in scores of 0.73 pts/month.
Age	-1.35	0.24	<.001	Intake score was 1.35 points lower for every year above the M.
Age*Early Time	0.10	0.06	0.14	Age did not affect Early outcome.
Age*Late Time	0.02	0.14	0.87	Age did not affect Late outcome.
Gender	0.22	1.64	0.90	Boys and girls had the scores at intake.
Gender*Early Time	-0.48	0.43	0.27	Gender did not affect Early outcome.
Gender*Late Time	0.69	0.92	0.45	Gender did not affect Late outcome.
Minority Race	-0.44	1.50	0.77	All youth, regardless of race, had the same scores at intake.
Custody				Youth in DCS/adoptive custody had had scores at intake that were 7.56 pts. lower than others.
Both biological parents				
One biological parent	-.47	1.84	0.80	
Other relative	-2.84	2.48	0..25	
DCS/adoptive	-7.56	3.13	<.05	
Custody				Youth in the custody of other relatives improved more slowly. Their outcome was a decrease in scores of 0.94 pts/month.
Both biological parents				
One biological parent	.61	.49	.21	
Other relative	1.72	.64	<.05	
DCS/adoptive	.69	.85	.46	
Custody				Youth in the custody of other relatives relapsed less. Their Late outcome was a decrease in scores of 2.3 pts/month.
Both biological parents				
One biological parent	-.92	1.03	.38	
Other relative	-3.03	1.23	<.05	
DCS/adoptive	-.01	1.65	.99	

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[1] Reference group: Caucasian boys in the custody of both biological parents with a mean age of 12.2 years.

points lower than other youth. Intake Functioning scores did not relate to custody. Yet, symptom score of youth in the custody of relatives (i.e., not a parent) improved more slowly during Early Time, but relapsed less than other youth during Late Time.

Question 2: Are youth outcomes worse for youth who have experienced a greater pile-up of stressors?

The findings using Model 2 to predict parent-reported symptoms are shown in Table 22 (see Appendix B for the functioning table). As expected, age predicted symptoms scores at intake, and gender predicted functioning scores. Older youth had

Table 22

Modeling Youth Symptoms: Pile-up of Stressors

Effect	β	SE(β)	Pr > |t|	Interpretation
Intercept	36.38	0.93	<.001	Symptom score at intake for reference group.[1]
Early Time	-2.22	0.21	<.001	Scores for reference group decreased 2.22 pts/month.
Late Time	2.48	0.42	<.001	Slope changed 2.48 pts/month. Resulting outcome was an increase in scores of 0.26 pts/month.
Stressors Index	-.04	0.49	.94	Stressors did not relate to the intake score.
Age	-1.24	.23	<.001	Intake score was 1.24 points lower for every year above the M.
Gender	-0.74	1.42	0.60	Boys and girls had the same scores at intake.
Stressors*Early Time	-0.22	0.12	0.06	Stressors did not affect Early outcome.
Stressors*Late Time	0.65	0.24	<.01	Youth with greater Stressors relapsed more, 0.65 pts/month for every point above the M in Stressors.

[1] Reference group: Males with a mean age of 12.2 years and a mean Index of Stressors=3.08.

lower symptoms scores at intake and girls had higher functioning scores. Pile-up of Stressors did not relate to functioning scores at intake or to change in outcome over time. Similarly, the Stressors Index did not relate to symptoms at intake or mental health outcome in the first six months. However, during Late Time, youth with greater pile-up of stressors relapsed more, having high symptoms scores.

Question 3: Do caregiver strain and parent attitudes predict youth outcome?

Parent-reported attitudes of "hope" were associated with intake scores and partially with outcomes. More positive parent attitudes were associated with less severe intake scores. Symptoms scores were 1.4 points lower and functioning scores 1.6 points higher at intake for every point change in the Stressor Index above the mean. Further, when caregivers reported more positive attitudes, youth outcomes in Early Time improved at a slightly slower rate. That difference in slope equated to about one point less improvement in symptoms or functioning (each Early Time interaction β multiplied by 6), for each point above the mean on the Attitudes scale. In contrast, when the parent reported greater hope, youth functioning relapsed less during Late Time. There was no similar impact on Late Time for symptoms as outcomes. The impact of caregiver attitudes on Early and Late functioning outcomes is illustrated in Figure 9.

Caregiver strain predicted only intake scores, and not mental health outcomes. When caregivers reported high levels of strain at intake, their children had symptom scores nearly 2 points higher and functioning scores roughly 1 point lower for every point deviation from the mean of Global Caregiver Strain. Table 23 summarizes the results for functioning (refer to Appendix B for symptoms results).

Table 23

Modeling Youth Functioning: Parent Caregiver Strain and Attitudes

Effect	β	SE(β)	Pr > |t|	Interpretation
Intercept	39.03	0.74	<.001	Functioning score at intake for reference group.[1]
Early Time	1.46	0.17	<.001	Scores for reference group increased 1.46 pts/month.
Late Time	-1.67	0.35	<.001	Slope changed 1.67 pts/month. Outcome was a decrease in scores of 0.21 pts/month.
Parent Attitudes	1.51	0.18	<.001	Intake score was 1.51 pts. higher for every point above the M.
Age	0.20	0.16	0.21	Age did not relate to intake score.
Gender	5.17	1.11	<.001	Females had intake scores that were 5.17 points higher than boys.
Attitudes*Early Time	-0.19	0.05	<.001	Youth with parent hope > M improved at a slower rate.
Attitudes*Late Time	0.26	0.11	<.05	When parent hope > M, youth relapsed less, 0.26 pts/month for every point above the M in Attitudes.
Global Caregiver Strain	-0.90	0.32	<.01	Intake score was 0.90 points higher for every point above the M.
Strain*Early Time	-0.06	0.09	0.53	Caregiver Strain did not impact youth Early outcome.
Strain*Late Time	0.10	0.21	0.63	Caregiver Strain did not impact youth Late outcome.

[1] Reference group: Boys with a mean age of 12.2 years, mean parent-reported Global CGSQ=8.75 and mean Attitudes=11.74.

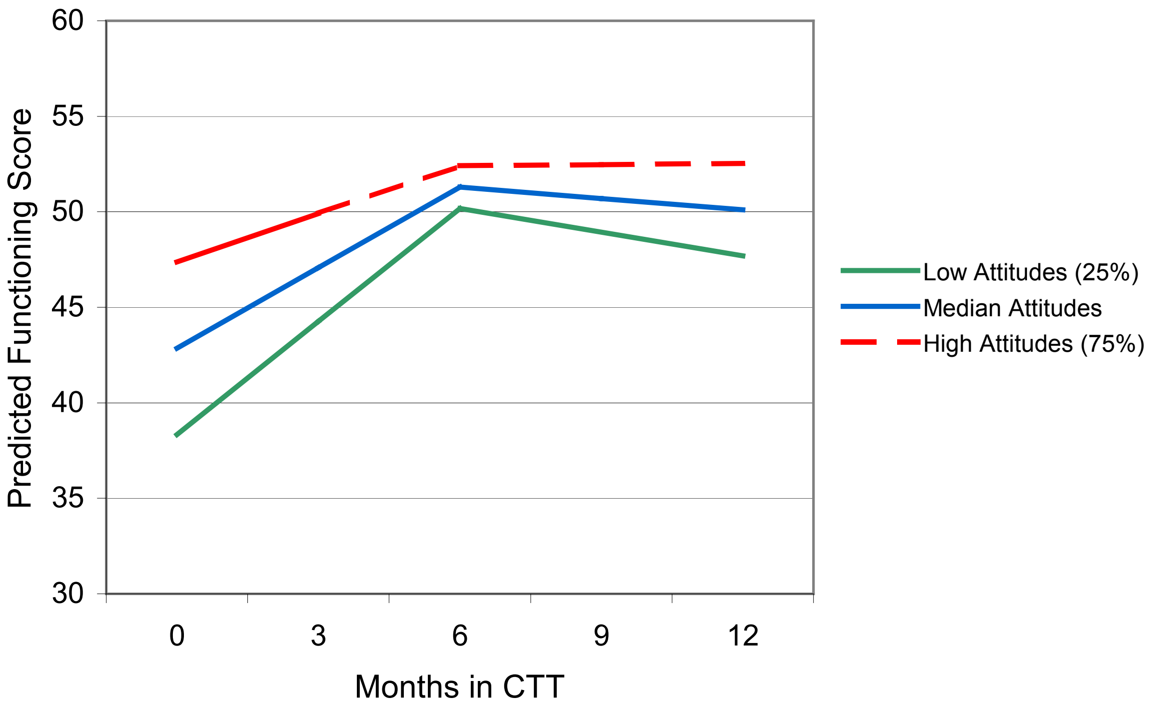

Figure 9. Impact of Parent Attitudes on Youth Functioning Outcome.

Question 4: Are characteristics of service delivery related to youth outcomes?

Intake scores were significantly associated with LOS. Youth who had longer stays had more severe symptom and functioning scores at intake ($\underline{p}<.05$ for symptoms, $\underline{p}<.01$ for functioning). Team membership and service diversity did not relate to scores at intake or to mental health outcomes. Frequency of contacts/month predicted functioning scores at intake and not symptom scores. Youth who had poorer functioning at intake had more CTT contacts/month. Frequency of contacts was associated with early symptoms outcomes, as youth improved more slowly during Early Time when they received more than 10 contacts/month. These observations are likely related to the teams matching services to needs. The tables are included in Appendix B.

Question 5: Are youth outcomes moderated by their caregivers' active involvement in managing their children's mental illnesses?

The impact of parent involvement on outcomes was evaluated in two ways. First, at the most basic level, parent involvement as a moderator of youth outcomes was examined. This is a similar relationship between a covariate and mental ehatlh outcomes that were evaluated in the previous models – that is, an interaction between a covariate and time. For example, parent attitudes were found to moderate both youth symptoms and functioning scores over time.

Secondly, parent involvement may interact with other predictor variables to impact youth outcomes. This conceptualization of a moderator is consistent with the framework provided by Baron and Kenny (1986) and discussed in more detail in the next chapter. The conceptual framework on which this study is based suggests that coping may moderate the relationships between the pile-up of stressors, perceptions, and resources and youth adaptation. It also suggests that coping may directly impact youth outcomes. Model 5 tested whether parent involvement moderated the relationships between pile-up of stressors and caregiver strain and youth outcomes.

Conceptually, a "step" moderating relationship, rather than a linear relationship, was hypothesized between parent involvement and stressors and caregiver strain (cf. Baron & Kenny, 1986, p. 1175). In other words, a minimal level of parent involvement is required to achieve effective coping thereby facilitating adaptation. Low levels of involvement may suggest poor coping skills and interfere with adaptation. To reflect this hypothesis, the 6-point parent involvement scale was dichotomized by defining scale response options 1-4 as low involvement and 5-6 as high involvement (refer to Table 11,

p. 65). Fifty-four percent of caregivers were classified as demonstrating high levels of parent involvement and the remaining 46% as showing low involvement.

The results of the analyses related to youth symptoms are displayed in Table 24 (refer to Appendix B for functioning results). Parent involvement did not relate to intake scores; however, it did relate to youth mental health outcomes. Level of involvement impacted early but not late symptom change, while the opposite was true for functioning change. When parents were involved, youth symptom scores improved faster in Early Time, but youth functioning scores relapsed more in Late Time. Thus, parent involvement does moderate youth mental health outcomes.

Interactions were evaluated to determine if parent involvement moderated the relationships of the pile-up of stressors and caregiver strain with outcomes. Parent involvement did not moderate the relationships between these variables and youth functioning outcomes. However, parent involvement was found to significantly moderate the impact of pile-up of stressors on youth symptoms. Figure 10 demonstrates the moderating relationships for low, median, and high levels of the Stressors Pile-up Index (defined as the 25th, 50th, and 75th percentiles scores for the sample). Similar early and late slopes are illustrated at all levels of the Stressors Index when parent involvement was high. However, when parent involvement was low, youth improved more slowly in the first six months. In Late Time, drastically different "relapse" patterns were demonstrated when families had varying levels of stressors. Youth whose caregivers were more involved demonstrated less relapse in symptoms during Late Time.

Table 24

Parent Involvement as a Moderator of Youth Symptoms [1]

Effect	β	SE(β)	Pr > |t|	Interpretation
Intercept	36.39	1.17	<.001	Symptom score at intake for reference group.[2]
Early Time	-1.60	0.34	<.001	Scores for reference group decreased 1.60 pts/month during Early Time.
Late Time	1.64	0.74	<.01	Slope changed 1.64 pts/month. Resulting outcome was an increase in scores of 0.04 pts/month.
Age	-1.09	0.21	<.001	Intake score was 1.09 points lower for every year above the M.
Gender	-1.98	1.29	0.13	Boys and girls had the same scores at intake.
Parent Involvement	0.73	1.48	0.62	Involvement did not relate to the score at intake.
Involvement*Early Time	-0.93	0.43	<.05	When parent involvement was high, youth Early outcome improved more.
Involvement*Late Time	1.32	0.90	0.14	Involvement did not impact Late outcome.
Global Caregiver Strain	3.18	0.32	<.001	Intake score was 3.18 points higher for every point above the M.
Strain*Early Time	-0.33	0.15	<.05	When Strain > M, youth improved faster.
Strain*Late Time	0.13	0.34	0.69	Strain did not impact Late Time.
Pile-up of Stressors	0.001	0.45	0.99	Intake scores did not relate to Pile-up.
Stressors*Early Time	-0.56	0.19	<.01	When Stressors > M, youth improved faster.
Stressors*Late Time	1.67	0.43	<.001	When Stressors > M, youth relapsed more.

Table 24, Continued

Effect	β	SE(β)	Pr > |t|	Interpretation
Involvement *Stressors*Early Time	0.53	0.22	<.05	Youth with high stressors and low involvement did not improve as much.
Involvement *Caregiver Strain*Early Time	0.13	0.17	0.45	Involvement and Strain did not interact to impact Early Time.
Involvement*Stressors* Late Time	-1.52	0.50	<.01	Youth with high stressors and high involvement did not relapse as much.
Involvement*Caregiver Strain*Late Time	0.15	0.39	0.69	Involvement and Strain did not interact to impact Late Time.

[1] Parent involvement was dichotomized, low and high (cf. Barron & Kenny, 1986, p. 1175).

[2] Reference group: Boys with a mean age of 12.2 years, low Parent Involvement, mean Stressors=3.08, mean CGSQ=8.75, and mean parent Attitudes=11.74.

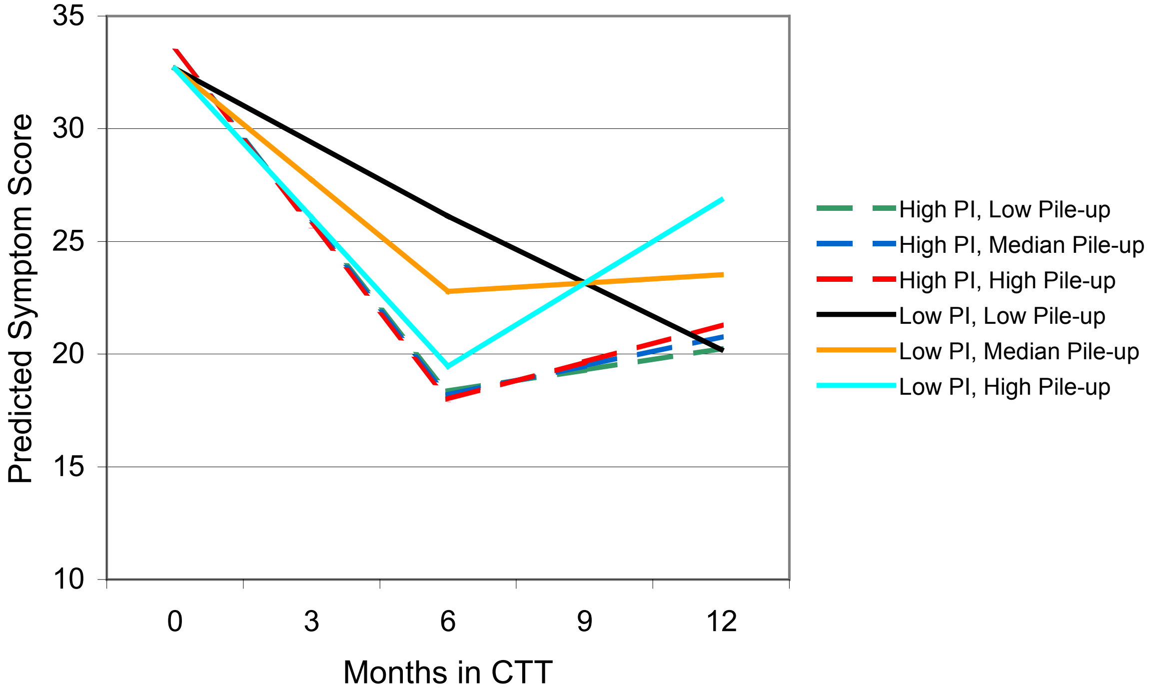

Figure 10. Parent Involvement as a Moderator of Pile-up of Stressors.

Investigating the Potential Impact of Missing Data

Contrasting Outcomes by Groups

Missing parent-reported data after intake (i.e., 6 months, discharge, etc.) potentially poses serious threats to the validity of the study's findings if the data are not missing at random. Several contrasts between groups of youth were investigated in order to assess the potential impact that the unbalanced data in this study might have on the findings. The characteristics of youth and their families were contrasted in two ways. The first compared the characteristics of youth and their families with one assessment versus those with two or more (refer to Table 25). This is key because it describes youth and their families who did not contribute difference scores (for comparison of improved vs. unimproved) or to the estimation of mental health outcome (i.e., slope). If those youth and their families are substantially different, the generalizability of the study's findings may be questionable.

Significant differences between the groups were found for 35% of the variables examined (8 of 23). Youth with higher functioning at intake, shorter lengths of stay, prior police contact, and less involved caregivers were less likely to have a follow-up assessment, $t(441) = 3.0$, $p<.05$, $t(460) = 4.5$, $p<.001$, $\chi^2 (1, \underline{N} = 462) = 6.4$, $\underline{p}<.05$, and $\underline{t}(460) = -3.8$, $p<.001$, respectively. Youth with more assessments received more service contacts per month and/or a greater diversity of services, $\underline{t}\ (460) = -3.9$, $\underline{p}<.001$ and $\underline{t}\ (460) = -4.0$, $\underline{p}<.001$, respectively. Finally, the tendency to have more assessments varied significantly by team, $\chi^2 (4, \underline{N} = 462) = 35.0$, $\underline{p}<.001$.

Table 25

Comparison of Youth and Caregivers with One versus Two or More Data Waves

	Only One Wave		Two+ Waves		
Variable	n	% or Mean (SD)	n	% or Mean (SD)	p
Youth Symptoms at Intake	156	35.2 (16.6)	290	37.1 (17.06)	ns
Youth Functioning at Intake	155	42.5 (15.6)	288	39.5 (13.9)	<.05
Team					
Team 1	18	72.0	7	28.0	<.001
Team 2	18	52.9	16	47.1	
Team 3	47	43.1	62	56.9	
Team 4	38	22.2	133	77.8	
Team 5	43	35.0	80	62.0	
Length of Stay (LOS)	164	5.3 (4.5)	298	7.3 (4.9)	<.001
Age at intake	164	12.4 (3.2)	298	12.1 (3.4)	ns
Gender					
Male	113	38.3	182	61.7	ns
Female	51	30.5	116	69.5	
Race					
Caucasian	124	37.2	209	62.8	ns
Minority	164	31.0	89	69.0	
Custody					
Both Biological Parents	41	32.5	85	67.5	<.05
One Biological Parent	94	40.9	136	59.1	
Relative	23	33.3	46	66.7	
DCS or Adoptive Family	6	16.2	31	83.8	
Family History of Mental Illness					
No	46	31.9	98	68.1	ns
Yes	96	34.4	183	65.6	
Abuse history *					
No	80	34.0	155	66.0	ns
Yes	79	36.9	135	63.1	
Comorbid Diagnosis *					
No	87	32.7	179	67.3	ns
Yes	77	39.3	119	60.7	
Youth Substance Use *					
No	104	334.3	199	65.7	ns
Yes	56	37.6	93	62.4	

Table 25, Continued

Variable	Only One Wave n	Only One Wave % or Mean (SD)	Two+ Waves n	Two+ Waves % or Mean (SD)	p
DCS Placement ever *					
No	132	35.9	236	64.1	ns
Yes	27	32.1	57	67.9	
Inpatient or residential *					
No	122	33.7	240	66.3	ns
Yes	34	42.5	46	57.5	
Previous Contact with Police *					
No	79	30.9	177	69.1	<.05
Yes	83	41.7	116	58.3	
School Problems *					
No	53	35.1	98	64.9	ns
Yes	109	35.6	197	64.4	
Family History SA/Dependence *					
No	80	31.6	173	68.4	ns
Yes	65	38.0	106	62.0	
Index of Stressors	164	3.3 (1.8)	298	3.0 (1.7)	ns
Global Caregiver Strain at Intake	164	8.8 (2.3)	298	8.7 (2.3)	ns
Parent Attitudes at Intake	164	11.7 (4.1)	298	11.8 (4.1)	ns
Parent Involvement	164	4.3 (.99)	298	4.6 (.97)	<.001
Service Diversity	164	3.1 (1.1)	298	3.5 (1.1)	<.001
Contacts/Month	164	9.4 (2.4)	298	10.3 (2.2)	<.001

* Note: These measures contributed to the Index of Stressors.

The second contrast of youth and their families compared youth with and without parent-completed discharge assessments. The results are included in Table 26. Seventeen percent (4 of 23) of the comparisons were significant. Once again, there were

Table 26

Comparison of Youth and Their Caregivers Without and Without Discharge Assessments

Variable	No D/C Assessment		D/C Assessment Completed		
	n	% or Mean (SD)	n	% or Mean (SD)	p
Youth Symptoms at Intake	197	36.2 (16.6)	249	36.7 (17.2)	ns
Youth Functioning at Intake	194	41.4 (15.4)	249	39.9 (14.0)	ns
Team					
Team 1	21	84.0	4	16.0	<.001
Team 2	21	61.8	13	38.2	
Team 3	66	60.6	43	39.4	
Team 4	46	26.9	125	73.1	
Team 5	50	44.2	73	55.8	
Length of Stay (LOS)	204	6.7 (5.8)	258	6.5 (4.1)	ns
Age at intake	204	12.2 (3.4)	258	12.2 (3.3)	ns
Gender					
Male	140	47.5	155	52.5	ns
Female	64	38.3	103	61.7	
Race					
Caucasian	154	46.2	179	53.8	ns
Minority	50	38.8	79	61.2	
Custody					
Both Biological Parents	52	41.3	74	58.7	ns
One Biological Parent	111	48.3	119	51.7	
Relative	31	44.9	38	55.1	
DCS or Adoptive Family	10	27.0	27	73.0	
Family History of Mental Illness					
No	69	44.2	87	55.8	ns
Yes	135	44.1	171	55.9	
Abuse history *					
No	108	43.9	138	56.1	ns
Yes	96	44.4	120	55.6	
Comorbid Diagnosis *					
No	112	42.1	154	57.9	ns
Yes	92	46.9	104	53.1	

Table 26, Continued

	No D/C Assessment		D/C Assessment Completed		
Variable	n	% or Mean (SD)	n	% or Mean (SD)	p
Youth Substance Use *					
No	138	44.5	172	55.5	ns
Yes	66	43.4	86	56.6	
DCS Placement ever *					
No	167	44.2	211	55.8	ns
Yes	37	44.2	47	55.8	
Inpatient or residential *					
No	162	42.6	218	57.4	ns
Yes	42	44.2	40	55.8	
Previous Contact with Police *					
No	104	40.2	155	59.8	ns
Yes	100	49.3	103	50.7	
School Problems *					
No	67	43.8	86	56.2	ns
Yes	137	44.3	172	55.7	
Family History SA/Dependence*					
No	123	43.6	159	56.4	ns
Yes	81	45.0	99	55.0	
Index of Stressors	204	3.9 (1.8)	258	3.7 (1.8)	ns
Global Caregiver Strain at Intake	204	8.9 (2.3)	258	8.6 (2.3)	ns
Parent Attitudes at Intake	204	13.4 (4.2)	258	13.2 (4.0)	ns
Parent Involvement	204	4.3 (.98)	258	4.7 (.98)	<.001
Service Diversity	204	3.2 (1.0)	258	3.5 (1.1)	<.01
Contacts/Month	204	9.6 (2.2)	258	10.3 (2.4)	<.01

* Note: These measures contributed to the Index of Stressors.

significant differences across teams, χ^2 (4, N = 462) = 53.5, p<.001. Caregivers that demonstrated greater involvement in treatment were more likely to have completed the Ohio Scales at discharge, t (460) = -3.8, p<.001. Youth who received more frequent contacts and/or a greater variety of services were more likely to have had an assessment at discharge, respectively, t (460) = -3.3, p<.01 and t (460) = -2.8, p<.01.

Findings from the Pattern-Mixture Approach

As described in Chapter 4, a simple description of data "completeness" was used to apply pattern-mixture modeling to assess the potential impact of missing data (cf. Hedeker & Gibbons, 1997). Youth were divided in two groups: (1) those with a parent-completed discharge assessment, and (2) those whose discharge assessment was missing. Fifty-six percent of youth had a discharge assessment (PMM variable assigned a value equal to 1.0) and the remaining 44% did not (PMM=0).

The next step was to rerun the base model and each of the five fixed-effects models adding the PMM variable as main effect and as interactions with Early and Late Time. The PMM variable was **insignificant** for all main and interactions effects in all ten models. The results suggest that missingness, defined as having a parent-completed discharge assessment, did not impact the model estimates (β), significance, or outcomes.

Implications of Unbalanced and Missing Data

This study addressed three primary types of missing data. First, predictor variables demonstrated low proportions of missing values (< 15%). They were addressed using EM algorithms to impute values and pose no threat to the validity of this study's findings. Second, youth with only intake assessments comprised almost a third of the youth in the study. Outcomes for these youth cannot be estimated, with difference scores or mixed models. Third, 44% of youth were missing parent-completed discharge assessments. This type of missingness may suggest lack of engagement, dropping out of services, or poor compliance with the study protocol by the case managers, for example. Nonetheless, missing discharge assessments hinders accurate estimates of youth mental health outcomes. Data that are MNAR violate the assumptions of the primary analytic methods used in this study.

Two approaches were used to explore the potential impact of the second and third types of missing data. One approach relied on evaluating contrasts between groups to suggest problems in generalizability or reliability of the study's findings. Groups were distinguished by: (1) one versus multiple assessments, and (2) completion of a discharge assessments. The second approach relied on the results of mixed modeling with and without a pattern mixture approach to assess the impact of data completeness.

Nearly three-quarters of the group contrasts yielded insignificant differences. Most of the differences resulted from the first comparison. Youth with only intake assessments had higher functioning scores and were less likely to be involved in the juvenile justice system. They also had shorter lengths of stay, less service diversity, and fewer contacts/month. These differences likely are interrelated, generally reflecting less severe youth impairment. Consequently, if services are individualized as specified by AdvoCare's SSOC Manual, stays in CTT should be shorter and services less intensive. Thus, adherence to the CTT model may account for many of the observed differences. Alternatively, or concurrently, legal involvement and parent involvement may pose barriers to or facilitate continued utilization of CTT services. Furthermore, higher engagement or “buy-in” to the need for services reflected by parent involvement may have facilitated completion of parent discharge assessments and promoted greater diversity and frequency of services.

Some of the characteristics that varied may reflect barriers to continuation in services or factors that tend to engage/retain families in services. For instance, youth with a history of juvenile court involvement may be more difficult to maintain in services. Stressors experienced by families may contribute to their prematurely dropping out of services. Greater parent involvement, service diversity, and frequency of service contacts/month were individually associated with having multiple assessments and a discharge assessment.

The key is whether or not these differences impact or bias the study’s findings. Whereas the majority of the significant differences are explainable by factors other than the dependent variables, assuming that missing data are MAR is unverifiable. However, it is important to note that of the differences highlighted by the contrasts, only 3 of 40 main or interaction effects involving these same variables were significant when evaluated with multilevel modeling. Thus, although there were differences between youth with intakes only and those with follow-ups, in large part, those factors were not related to outcomes. The results of the pattern-mixture approach further suggested that missing data were MAR and did not bias the study’s results.

Significance of Findings

Pseudo-R^2 values for multi-level models can be calculated by squaring the correlation between a model's observed and predicted scores (cf. Singer & Willett, 2004, p. 102). For the base models, R^2 values were 0.69 and 0.70 for predicting symptoms and functioning, respectively. So, before adding predictor variables, 69-70% of the total variability in mental health outcomes was explained by piecewise time (i.e., unconditional growth model). The five models tested subsequently produced pseudo-R^2 values ranging between 0.64 and 0.70. At first glance, these statistics seem counterintuitive, suggesting less variance was accounted for when the covariates were added. However, the phenomenon of negative pseudo-R^2 statistics is recognized by statisticians who recommend caution in calculating and interpreting these statistics (Singer & Willet, 2004; Snidgers & Bosker, 1999). Occasionally, adding predictors increases the magnitude of the variance components. Most often, this occurs when there is a large discrepancy between the contributions of within and between variation to the outcome variable. In this dataset, roughly two thirds of variation in outcomes was attributable to differences between youth.

Consequently, effects sizes cannot be calculated. Most of the outcome effects found in this study are likely small to medium. The power analysis suggested that the study design had 80% power to detect an effect size of .25 points per month (equivalent to a Cohen's d of .30 SDs between groups). The results verified adequate power by detecting small effects. Model 1 detected a difference in symptom scores of 0.36 points/month during Late Time between groups differing in custody at intake. Model 1 also was one of the larger models, including 20 parameters.

The use of random-intercept mixed models was critical in order to simultaneously consider the effects of all model covariates and in order to control for initial severity of the dependent variable. The group contrasts suggested that youth who improved had more severe scores at intake. Statistically, extreme scores are more likely to be more moderate if re-measured, simply by chance (i.e., regression to the mean). The mixed-effects intercept term controls for differences at intake because it is allowed to vary across youth. In other words, every youth has his/her own starting point. Mental health outcomes or slopes are estimated independently.

CHAPTER VI

DISCUSSION

Youth Mental Health Outcomes

In general, mental health outcomes demonstrated more rapid improvement in the first six months, followed by a period of relapse during which time change in mental health outcomes was much slower. This pattern was not only evident visually but also analytically by fitting piecewise unconditional growth models with random intercepts to model the youth outcomes.

The difference score contrasts shown in Tables 25 and 26 indicated few significant differences between youth who improved and those who did not. Similarly, the results of fitting the mixed models illustrated that explaining variance in youth outcomes, over and above the contribution of the intake score, was difficult. Overall, significant main effects were more prominent than interaction effects. In other words, covariates more often predicted intake scores (i.e., intercept) than mental health outcomes (i.e., slopes). Moreover, the predictors included in the models more often demonstrated relationship to youth symptoms as opposed to functioning as mental health outcomes. Table 27 summarizes the significant findings from the five mixed-effects models. The findings from each model then briefly discussed.

Table 27

Summary of Mixed-Effects Findings [1]

Model	Predicting Score at Intake (Intercept)	Mental Health Outcome (Slope)
1. Predisposing & Enabling Factors		
Symptoms	Age, Custody	Youth in relative's custody improved slower Early, relapse less Late.
Functioning	Age, Gender	None
2. Pile-up of Stressors		
Symptoms	None	Youth with higher Pile-up showed more relapse.
Functioning	None	None
3. Caregiver Perceptions		
Symptoms	Attitudes, Caregiver Strain	Youth improved at a slower rate when Attitudes were more positive in Early.
Functioning	Attitudes, Caregiver Strain	Youth improved less when Attitudes were more positive in Early and relapsed in Late.
4. Service Characteristics		
Symptoms	LOS	Youth with more contacts/month improved slower in Early Time.
Functioning	LOS, Contacts/month	None
5. Parent Involvement as a Moderator		
Symptoms	Caregiver Strain	Youth with high parent Involvement improved more Early. Youth with higher Stressors improved more Early but relapsed more Late. Involvement moderated effects b/t Pile-Up with symptoms over time. Involvement was not a moderator for Strain.
Functioning	Caregiver Strain	Youth with high Involvement relapsed more. Involvement did not moderate the effect of Pile-Up and Strain with youth outcomes.

[1] Summary does not include terms for intercept, Time Early, Time Late, and controlling variables (age & gender) in each model.

Predisposing and Enabling Factors

Although age and gender were related to intake scores, they did not predict mental health outcomes. Youth need for services, typically measured by symptoms or impairment, consistently has been noted as the strongest predictor of outcome (e.g., Lambert et al., 1996). The strength of the unconditional growth model along with the results of the individual mixed-effects models supports the previous research findings.

Differences in youth mental health outcomes related to custody or family structure have important implications for several state agencies as well as for the BHOs. Figure 11 illustrates slower improvement in early outcomes for youth in relative care and less relapse in late outcomes as well as greater relapse in symptoms for youth in DCS custody. This finding underscores the importance of the ecological perspective of the

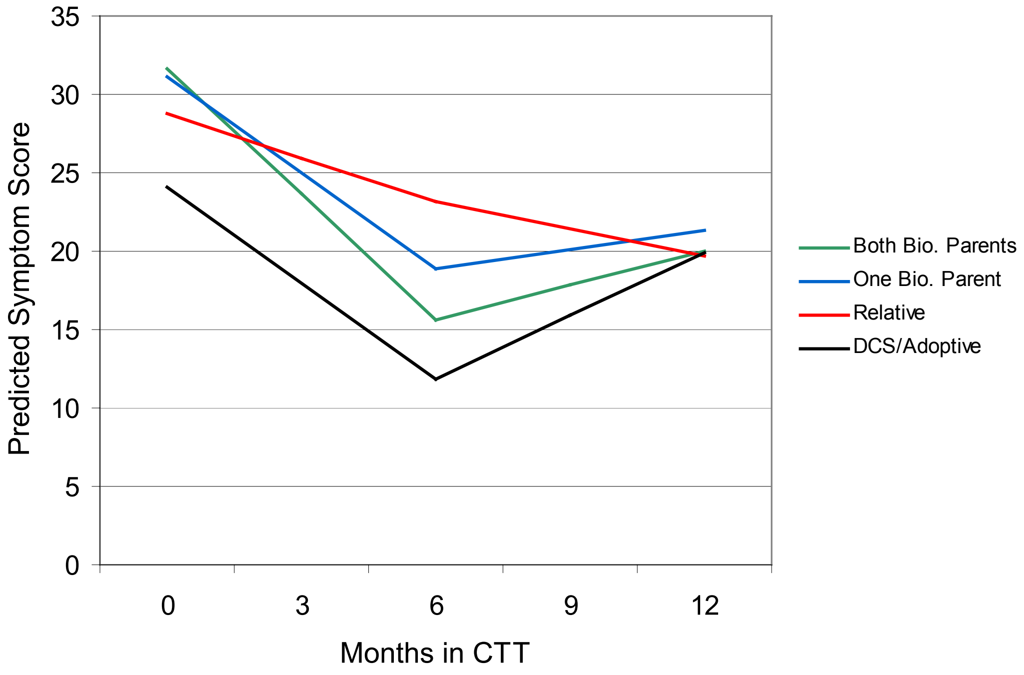

Figure 11. Differences in Intake Scores and Outcome Related to Custody.

Youth Mental Health Services Outcomes Conceptual Model. Youth outcomes should be examined within the context of their families and communities (Heflinger et al., 1998). These youth often experience revolving placements, in and out of state custody, and shuffled from one home to another. Although 6% of the youth were in DCS custody at admission to CTT, nearly 20% had been is DCS custody sometime in the past. Further, although 14% of the youth were formally in the custody of their grandparents and other relatives, many more were living informally in extended family settings.

Relative care, especially grandparents raising children, is a growing phenomenon (e.g., Goodman & Silverstein, 2001; Hayslip & Kaminski, 2005). Since 1990, grandparent-headed households have grown by 30% (U.S. Bureau of the Census, 2000). Nationally, the majority of youth raised by grandparents are not in the foster care system. In fact, only about 5% of children in relative care are in foster care system (Generations United, 2006). Relatives assume care-giving responsibilities for a plethora of reasons including abuse, neglect, or parental incarceration, substance use, or mental illness. For instance, 47% of youth in this study had experienced abuse or neglect.

In a review of the literature on grandparent-headed families, Cuddleback (2004) noted that grandparents caring for their grandchildren more often were limited in daily functioning, suffered from depression, and in poorer health than other grandparents. Grandparent caregivers are typically African American, less educated, unemployed, and of lower socioeconomic status (Cuddleback, 2004; Taylor-Richardson, Heflinger & Brown, 2006; U.S. Bureau of the Census, 2000). Often, they lack adequate social supports and resources and are ill-prepared to raise children, especially those with SED (Sands & Goldberg-Glen, 2000). Relative caregivers face greater barriers in advocating for appropriate educational services and assisting with homework, for example. Consistent with this literature, in this study, youth in the custody of relatives or the State more often had problems at school, χ^2 (3, N=462)=7.9, p<.05.

Compared to non-family foster families, kinship foster families receive less training, fewer services, and less support (e.g., Cuddleback, 2004). These problems are exacerbated in families where relatives are caring for children informally. They face challenges including school enrollment and involvement, health care insurance, legal representation, and shortage of supportive services (Generations United, 2006; Hayslip & Kaminski, 2005). They too often experience high levels of stress and psychological distress, particularly when caring for a youth with SED.

Youth in relative care also tend to lack adequate social supports. For example, these youth are less likely to be involved in extracurricular activities and demonstrate lower school engagement (Billing, Macomber, Kortenkamp, 2002). Youth in relative care are more likely to have repeated a grade (Cuddleback, 2004).

Caregiver coping and social support have been found to mediate negative outcomes for parents of children with disabilities and behavior problems (Hastings & Johnson, 2001; Jones & Passey, 2005). The growing incidence of relative caregivers, the barriers and negative outcomes documented in the literature, and the results of this study underscore the urgency of responding to these gaps in services. Child- and family-serving sectors and agencies (i.e., health, mental health, social services, community providers, etc.) must collaborate to "braid" existing resources to expand relative caregivers' access to supportive services (e.g., parenting skills, education of current issues faced by teens, assistance accessing services, support groups, etc). Training targeting providers can increase their sensitivity to the differing needs of relative caregivers. At the policy level, administrators need to be more aware of the needs and barriers faced by relative caregivers. Enhancing training and educational efforts targeting relative caregivers participating in CTT services can be evaluated by randomly assigning youth to CTT services as usual or to services with additional supports and then assessing youth and family outcomes over time.

Pile-Up of Stressors

The pile-up of stressors did moderate change in youth outcomes, more so for symptoms than for functioning, however. In addition, stressors did impact symptom change through a mediating relationship with parent involvement. However, involvement did not moderate the effect of stressors on functioning change.

Both direct and moderating relationships are consistent with this study's proposed model as well as the Double ABCX model. Hastings et al. (2006) noted considerable variation in families' responses to stress. Hastings and colleagues asserted that stress should be evaluated in the context of the other model components (Hastings and Taunt, 2002). Saloviita et al. (2003) asserted that for parents of children with intellectual disabilities, negative appraisals of the situation was the best predictor of parental stress. However, in this study, there was no relationship between stressors and parent attitudes or caregiver strain. Hastings and Taunt (2002) asserted that positive perceptions moderated the coping process. Perhaps this process may be critical, thereby obscuring the relationship of these components with child outcomes. Further analyses are needed to more broadly explore the direct and moderating relationships between stressors, caregiver strain, parent involvement and youth mental health outcomes guided by the conceptual model.

Walrath et al. (2006) suggested that the numerous challenges faced by families of children with abuse histories may have a "synergistic effect in conferring risk for negative outcomes for some children" (p. 144). In this study, abuse was not examined separately but within the broader concept of the pile-up of stressors. When history of abuse was removed from the index, youth with histories of abuse did have significantly higher indices of Stressors Pile-up than youth with no abuse histories (means of 3.61 and 2.98, respectively, $\underline{t}(460) = -4.25$, $\underline{p}<.001$). Moreover, youth with histories of abuse (47%) were much more often in the custody of relatives or the State (χ^2 (3, $\underline{N}$=462)=46.2, $\underline{p}<.001$). As previously discussed, youth in relative care tended to demonstrate slower improvement and youth in DCS custody experienced greater relapse in symptoms after 6 months in CTT services. Clearly, more in-depth study is needed to untangle some of these complicated relationships

Parent Perceptions

From the results of one mixed-effects model (Model 3), caregiver strain predicted intake scores. Caregivers who reported higher strain also rated their children as having more severe symptoms and poorer functioning. This finding is consistent with the body of literature on caregiver strain. Relative, adoptive, and DCS caregivers reported significantly less caregiver strain than did biological parents, $\underline{t}(458)=2.7$, $\underline{p}<.001$). These caregivers also were more often African American than biological parents with custody, although the difference was not statistically significant, χ^2 (3, $\underline{N}$=462)=3.4, $\underline{p}>.05$. These findings are consistent with Taylor-Richardson et al. (2006) who documented lower and differing patterns of strain among relative caregivers.

After intake, the impact of caregiver strain is not clear from the results of this study. The results of Model 3 showed no association between caregiver strain and youth outcomes. Conversely, in a broader, more complex model to evaluate the moderating characteristics of parent involvement in services (Model 5), caregiver strain **did** demonstrate a direct effect on symptom change during the first 6 months of services. Caregiver strain did not show a relationship with functioning change in either test.

The other measure of parent perceptions used in this study, hope, as measured by the Ohio Scales, was found to predict intake scores as well as symptom and functioning outcomes. However, the nature of these relationships is not clear. Youth whose caregivers reported higher hope at intake improved slightly slower but also tended to relapse less after 6 months. Youth parent-reported intake scores also were less severe. In part, these results may suggest more gradual but stable change for these youth. Alternatively, change may be less because scores started less severe, and thus, did not have the propensity for as much change by chance (i.e., regression to the mean). In short, the results of this model shed little light on understanding the role of perceptions in the larger context of the Youth Mental Health Services Outcomes Conceptual Model. Follow-up analyses that contrast youth outcomes reported by case managers in addition to parents may help to sort of these questions. Further evaluation of mediating and moderating effects may illuminate important relationships to guide service improvements.

Service Characteristics

There were few relationships between service characteristics and youth intake scores or outcomes. Youth with more severe scores at intake tended to have longer lengths of stay. Also, youth with higher mean contacts/month improved slightly less over the first 6 months in CTT services. These findings appear to relate to severity of illness and appropriate matching of services to youth and family needs by the CTTs.

Team membership did not predict intake score or early or late youth outcomes. In developing the base mixed-effects models, teams accounted for very little of the variance between youth scores at intake, and thus, a 3-level model was not used. Although symptoms and functioning scores at intake did not vary across teams, there were significant differences across the teams in other characteristics including age, caregiver strain, parent attitudes, parent involvement, LOS, and services diversity ($\underline{t}$ tests, 2 sided, $\underline{p}<.05$). One team served more minority families (48%) than did the others (20-31%), $\chi^2(4, \underline{N}=462)=9.5$, $\underline{p}=.05$.

This study incorporated few measures to describe the variability in CTT services. Most likely, the predictive power of these characteristics were limited by floor effects and restricted variance as a result of AdvoCare's SSOC standards and billing practices. Providers are paid a monthly case rate for services and must meet certain criteria to be eligible for payment. For example, a minimum of 10 service encounters per month were required for each youth (excluding the admission and discharge months). Case management contacts accounted for 86% of all encounters captured by the claims data. The next most common service types, medication management and individual therapy, can be considered more traditional, youth-centered modalities. Family and group therapy accounted for less than 4% of the service encounters. Finally, the findings from the assessment of program fidelity demonstrated relatively high scores across the CTTs and no significant differences between the teams. Given limited variability, the power to decipher the impact of service factors on youth outcomes was quite limited.

Parent Involvement as a Moderator

Mediating and moderating relationships within the context of the Double ABCX model have been commonly assumed (e.g., Aldwin & Yancura, 2004). The same relationships were assumed for the Youth Mental Health Services Outcomes Conceptual Model used in this study. A classic framework for describing and evaluating a moderating relationship is described by Baron and Kenny (1986). Figure 12 employs their framework within the context of this study. Pathway c is the primary focus in

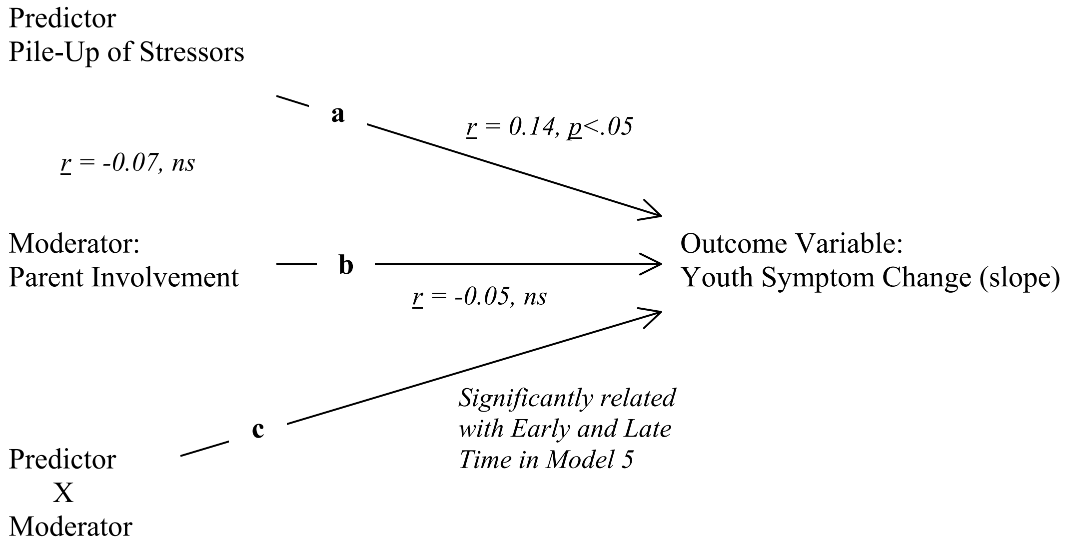

Figure 12. Moderator Model for Symptoms [1]

[1] Adapted from Baron & Kenny (1986).

testing a moderating relationship. Also, there can be a significant relationship between the predictor and outcome (Pathway a). In this case, there was a small correlation between the Pile-up Stressors Index and symptom change. According to Baron and Kenny (1986), it also is desirable that the moderator be uncorrelated with the predictor and the outcome variable. In fact, parent involvement was not associated with stressors or symptom change. This scenario provides a more clear-cut interpretation of the moderating relationship according to Baron and Kenny (1986).

Limitations

This study was limited by the quality of the data from AdvoCare's QIA. The selection of CTTs for the QIA was based on convenience sampling to some extent, because only those established teams chosen by the managed care company who agreed to participate were included. Although all youth and their families who enrolled in CTT were to be included in the study, in reality, only 73% of youth enrolled in the five CTTs were included in the QIA's data (based on service utilization data provided by AdvoCare, March, 2006). This threatens the extent to which the results of AdvoCare's QIA can be generalized to all youth and their families receiving services from CTTs. Similarly, youth included in the study with intake assessments only also threatens the generalizability of findings.

Although exploration of the differences between the two groups was limited (i.e., service utilization, age, diagnosis, gender, team, length of stay), there is some basis to assess the equivalence of the two groups. The exploration also yields useful information to the BHOs and community mental health agencies about those youth and their families who were successfully engaged in services and those who were not. Qualitative feedback at the team level has suggested that the majority of those youth and their families not included in AdvoCare's QIA were those with short stays (i.e., less than 30 days) and/or those who did not fully engage in services. Some families were uncooperative with the survey process, and, at times, case managers did not follow the QIA's data collection protocol. All of these possibilities suggest that engagement processes ma need to be examined and strengthened.

Repeated youth assessments available for this study were limited. Whereas 446 observations were available to estimate intake scores, 338 were available to estimate Early Time and 147 (16% of the total) were available to estimate Late Time. Thus the estimates of slope after six months are less stable than the other estimates. Thus caution in interpreting the results in the absence of additional information is urged.

AdvoCare's QIA did not include quasi-experimental methods or comparison groups in order to isolate cause and effect of youth treatment outcomes. Resources were too thin and the primary intent of the project was descriptive in order to stimulate quality improvement and inform decision-making about SSOC revisions (e.g., exploring evidence to guide program policies about frequency, types services, etc.). Over time, youth included in the AdvoCare QIA demonstrated improvement in youth symptoms and functioning across generic and symptom-specific measures. Caregivers also demonstrated decreased caregiver strain over time (AdvoCare, 2004; 2006). However, due to the lack of comparison or control groups, there is no basis for concluding that the youth and family improvements were due to services alone, in combination with exogenous factors, or as related to statistical artifacts including regression to the mean.

Nonetheless, given the limitations of AdvoCare's data, the proposed study provided an opportunity to explore the relationship between differential outcomes and contextual factors within real-world Medicaid managed care settings. Child and adolescent mental health services research simply cannot provide hard evidence about practice or address practice in all settings (Hoagwood et al., 2001). Given the diverse youth and family populations that CTTs serve, this study demonstrated that real world datasets do yield useful information that is potentially useful to researchers and policy makers alike. The findings offer a first step in that process that may eventually lead to changes in program design or enhancements to the quality of services. The implications suggested by this study should be further evaluated in order to strengthen the evidence underlying recommendations for possible programmatic quality improvements. Any subsequent service improvements or CTT model changes should in turn be evaluated to determine the benefit or impact.

Implications for Research and Practice

Continued exploration of this dataset is needed. In particular, exploring whether the major findings are replicated when youth outcomes are reported by other respondents (i.e., case managers and youth) will be key. For example, does the moderating effect of parent involvement between stressors and youth outcomes hold-up when outcome is defined by the reports of case managers rather than caregivers? Secondly, follow-up analyses, particularly exploring the nature of moderating relationships, will contribute to further to this study's findings. More broadly, replication of this study's findings using data from other service settings will allow the generalizability of the findings to be evaluated. In particular, replication of the models using data having more repeated assessments over time would strengthen assessment of youth mental health outcomes. Nonetheless, these findings, whether based on the outcome reports of parents, youth, or case managers, have implications for quality improvement opportunities for CTT services.

While the CTT service model does require that services are family-driven and community-based, the services received by youth and their families in this study were still fairly narrowly focused on youth. For example, in completing the measure of program fidelity (using the Wraparound Fidelity Index), parents reported lower scores for Community-based Services and Supports as well as Parent and Youth Voice/Choice, relative to the other 9 subscales. Several findings from this study indicated that a broader focus on family needs is needed in order to maintain observed youth improvements. This extension suggests more frequently engaging families in nontraditional therapeutic services as well as providing opportunities to enhance parenting skills, create social support networks, strengthen school and community engagement, and link caregivers to additional services in the community. Thus, the constellation of available family support services needs to be intentionally expanded. Although risk factors, crisis, and caregiver strain may lead to service utilization, CTT services need to magnify strategies to strengthen youth **and** family protective factors. Finally, training that highlights the patterns of youth outcomes, gaps in services, and appropriate supports for youth in relative care should be provided to providers.

Further research in the field needs to be undertaken which yields actionable quality improvement opportunities. While evaluating the effectiveness of intensive case management models for youth is critically important, the vast majority of real world community settings do not have the resources to support experimental or effectiveness studies. However, the field can benefit from the exploration of data from community-based settings. Researchers need to more often consider mediating and moderating relationships suggest by theory (e.g., Jensen et al., 2005). It also is important that these studies employ a strong theoretical foundation and use diverse, innovative, but appropriate analytic strategies (Nixon, 1997).

This study demonstrated the strengths of mixed modeling in describing longitudinal you mental health outcomes. The analytical tool accommodated unbalanced and missing data, described nonlinear outcomes, and incorporated a pattern-mixture approach that relaxed the assumption that missing data was MAR. Mixed models should be the technique of choice in longitudinal research as the assumptions of other techniques are violated by correlated errors created by repeated assessments and nesting of individuals in settings (i.e., families, teams, sites, etc.)(Gibbons et al., 1993).

Further, this study underscores the usefulness of the Youth Mental Health Services Outcomes Conceptual Model as the theoretical foundation guiding real world evaluation of mental health services for children. The most significant findings highlight the ecological nature of mental health services for youth in real world settings. For example, although it is well documented that caregiver strain increases utilization of youth mental services, there is little understanding of how strain impacts aspects of services delivery, family coping skills, and family adaptation. Moreover, the interaction of family structure and youth outcomes was demonstrated. The multi-component Double ABCX model and model proposed for this study do pose challenges to researchers.

Larger models may suggest different conclusions than simpler, nested models. Yet, broader, more complex models require considerably more participants and repeated assessments. Even in cases where there is sufficient power, interpreting broader, more complex models, especially those with 3-way interactions, becomes unwieldy. Thus, a balance must be achieved, and tested models should be strongly tied to theory.

The findings of this study are consistent with several of the recommendations from the Subcommittee on Children and Families of the President's New Freedom Commission (Huang, Stroul, Friedman, Mrazek, Friesen, Pires, & Mayberg, 2005). Specifically, the subcommittee highlighted that services should be individualized, designed to support families and include them as partners, and emphasize prevention and intervention. However, often there is little recognition of some barriers that children and their families face. Again, perhaps individualized services are not broad enough. Services tend to focus on symptom reduction rather than building longer-terms skills and capacity that may mitigate relapses in symptoms and functioning.

Lack of financial resources likely will always be a challenge. Yet, agencies need to think outside the box to develop more collaborative efforts with other community agencies, particularly schools, government social services, and nonprofit agencies. Although attention to families has been growing over the past decade, true partnerships are rarely achieved (Huang et al., 2005). This study demonstrated that at the service delivery level, parent involvement and partnership with case managers was important in maintaining positive outcomes.

APPENDIX A

MEASURES

C&Y CTT Intake

CMHA: ☐$_1$ Carey ☐$_2$ Frayser ☐$_3$ PCS-1 ☐$_4$ PCS-2 ☐$_5$ Pathways

Youth Name:__|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_

CTT ID:__|_|_|_|_|_|_|_|_|_|_|_|_ Social Security #:___ ___ ___-___ ___-___ ___ ___ ___
(CMHA case number)

CTT Admit date:_____/____/____ Gender: ☐$_1$ Male ☐$_2$ Female Date of Birth: _____/____/____

Ethnicity: ☐$_1$ Caucasian ☐$_2$ Black ☐$_3$ Hispanic ☐$_4$ Asian ☐$_5$ Other

Primary Dx:______________________________ Secondary Dx:______________________________
(Use DSM-IV codes)

Other Dx:______________________________ Case Manager:______________________________

Youth Education:

School Grade: K 1 2 3 4 5 6 7 8 9 10 11 12 ☐ not in school
(Circle grade youth is in now or if summertime, the grade youth will be entering)

If not in school, why not (i.e., enrolled, do not consider temporary absences, e.g., suspension or illness) ?
☐$_1$ Dropped out ☐$_2$ Completed GED ☐$_3$ Graduated HS ☐$_4$ Homebound ☐$_5$ Expelled ☐$_6$ Too young

If not in school, what is highest grade completed? 6 7 8 9 10 11 12 GED

Has youth qualified for special education services? ☐$_0$ No ☐$_1$ Yes ☐$_2$ Don't know

If yes, under what program? ☐$_1$ 504 ☐$_2$ IDEA ☐$_3$ Other:________________________

Prior expulsions (ever)?
☐$_0$ No ☐$_1$ Yes ☐$_2$ Don't know ☐$_3$ Refused If yes, how many times(ever)?______________

Has youth been expelled in the **past 6 months**?
☐$_0$ No ☐$_1$ Yes ☐$_2$ Don't know ☐$_3$ Refused

Prior school suspensions (ever)?
☐$_0$ No ☐$_1$ Yes ☐$_2$ Don't know ☐$_3$ Refused If yes, how many times in past 6 months?______

Has youth received any disciplinary actions at school in the **past 6 months**?
☐$_0$ No ☐$_1$ Yes ☐$_2$ Don't know ☐$_3$ Refused

If yes, which of the following? *(Check all that apply)*:
☐ Detention ☐ In-school suspension ☐ Alternative classroom ☐ Alternative school ☐ Other

Youth History:
Does youth have a history (i.e., ever) of any of the following?

Gang membership? ☐$_0$ No ☐$_1$ Yes ☐$_2$ Don't know ☐$_3$ Refused

Homelessness: ☐$_0$ No ☐$_1$ Yes ☐$_2$ Don't know ☐$_3$ Refused

Sexual Abuse: ☐$_0$ No ☐$_1$ Yes ☐$_2$ Don't know ☐$_3$ Refused

Physical Abuse:	☐$_0$ No	☐$_1$ Yes	☐$_2$ Don't know	☐$_3$ Refused
Neglect:	☐$_0$ No	☐$_1$ Yes	☐$_2$ Don't know	☐$_3$ Refused
DCS Custody:	☐$_0$ No	☐$_1$ Yes	☐$_2$ Don't know	☐$_3$ Refused
Substance Use: *(Include tobacco use for youth under-aged)*	☐$_0$ No	☐$_1$ Yes	☐$_2$ Don't know	☐$_3$ Refused

If yes, indicate which of the following substances youth has used *(check all that apply)*:

☐ Tobacco
☐ Beer, wine
☐ Hard Liquor
☐ Marijuana, pot
☐ Crack/cocaine
☐ Huffing/inhalants
☐ Methamphetamine, uppers
☐ Traquillizers, sedatives, downers
☐ Other *Specify:*________________

Has youth received any substance abuse treatment in the **past 6 months**?
☐$_0$ No ☐$_1$ Yes ☐$_2$ Don't know ☐$_3$ Refused

Has youth attended any support groups (e.g., AA or NA) in the **past 6 months**?
☐$_0$ No ☐$_1$ Yes ☐$_2$ Don't know ☐$_3$ Refused

Youth Legal Involvement:

Has youth had any contact with the police or legal system in the past (ever, e.g., arrested, charged, questioned)?
☐$_0$ No ☐$_1$ Yes ☐$_2$ Don't know ☐$_3$ Refused

In the past 6 months, has youth been arrested by police, that is picked up and charged?
(If child was charged without being picked up, i.e., received mailed notice to appear in court, this should be coded as "Yes." If the youth was questioned, but not charged, this should be coded as "No.")
☐$_0$ No ☐$_1$ Yes ☐$_2$ Don't know ☐$_3$ Refused

If yes, how many times?____________

In the past 6 months, what types of charges were filed against youth?
(Check all that apply)

☐ Status (runaway, truant, etc.)
☐ Unruly
☐ Delinquent
☐ Criminal
☐ Drugs or alcohol
☐ Other *Specify:*________________________

In the past 6 months, has youth been on probation?
(Code "yes" for criminal activity only, not related to school or psychiatric only.)
☐$_0$ No ☐$_1$ Yes ☐$_2$ Don't know ☐$_3$ Refused

In the past 6 months, has youth spent time in a jail or detention facility?
(Consider situations only related to criminal behavior.)
☐$_0$ No ☐$_1$ Yes ☐$_2$ Don't know ☐$_3$ Refused

If yes, how many times?____________

Total number of days?____________

In the past 6 months, has youth been sent to a secure state-run facility such as a training school, youth developmental center, etc.? (Code "yes" for criminal activity only, not related to school or psychiatric only.)
☐$_0$ No ☐$_1$ Yes ☐$_2$ Don't know ☐$_3$ Refused

If yes, how many times?____________

Total number of days?____________

Legal Custody: *(Check all that apply)*	☐ Biological Mother ☐ Biological Father ☐ Grandmother ☐ Grandfather	☐ Step Mother ☐ Step Father ☐ Aunt ☐ Uncle	☐ Foster Parent ☐ Adoptive Parent ☐ DCS ☐ Other *Specify:*____________

If in DCS custody:

How long (MONTHS)? ____________ Plans to reunify youth with parents? ☐ $_0$ No ☐ $_1$ Yes ☐ $_2$ Unsure

If not living with ALL legal guardian(s)indicated above at time of INTAKE, or in DCS custody, with whom is the youth living (adult caretakers only)?

(Check all that apply)	☐ Biological Mother ☐ Biological Father ☐ Grandmother ☐ Grandfather	☐ Step Mother ☐ Step Father ☐ Aunt ☐ Uncle	☐ Foster Parent ☐ Adoptive Parent ☐ Other *Specify:*____________

residential moves in the past 12 months:____________ # siblings currently in household:____________

The following questions pertain to youth's <u>adult</u> legal guardian(s) only, but not DCS. If in DCS custody currently, but for less than one year, complete section about youth's biological parent(s).

Current Employment/Income of Primary Caretaker:

____________ *(indicate who)* ☐ $_1$ Unemployed ☐ $_2$ Regular Part-time ☐ $_3$ Full-time ☐ $_4$ Irregular/ Odd jobs ☐ $_5$ Retired ☐ $_6$ SSI/SSDI

Current Employment/Income of Other Adult Caretaker:

____________ *(indicate who)* ☐ $_1$ Unemployed ☐ $_2$ Regular Part-time ☐ $_3$ Full-time ☐ $_4$ Irregular/ Odd jobs ☐ $_5$ Retired ☐ $_6$ SSI/SSDI

History of mental health problems? ☐ $_0$ No ☐ $_1$ Yes ☐ $_2$ Don't know ☐ $_3$ Refused

If yes, who?____

Received mental health services in **past 12 months**? ☐ $_0$ No ☐ $_1$ Yes ☐ $_2$ Don't know ☐ $_3$ Refused

If yes, who?____

History of substance abuse or dependence? ☐ $_0$ No ☐ $_1$ Yes ☐ $_2$ Don't know ☐ $_3$ Refused

If yes, who?____

Current substance abuse or dependence issues? ☐ $_0$ No ☐ $_1$ Yes ☐ $_2$ Don't know ☐ $_3$ Refused

If yes, who?____

Incarcerated in **past 12 months**? ☐ $_0$ No ☐ $_1$ Yes ☐ $_2$ Don't know ☐ $_3$ Refused

If yes, who?____

Arrested or charged in **past 12 months?** ☐ $_0$ No ☐ $_1$ Yes ☐ $_2$ Don't know ☐ $_3$ Refused

If yes, who?____

Charge?____

Probation in **past 12 months**? ☐ $_0$ No ☐ $_1$ Yes ☐ $_2$ Don't know ☐ $_3$ Refused

If yes, who?____

Youth Monthly Tracking Form

Youth Name:____________________ ID#:___________________________

Please complete one row at the end of each month for that calendar month. Use the scales below and on the back to complete this form.

Date	If DCS Custody (leave blank if NA)	CGAS Score (see back)	Treatment		Legal Involvement			Housing	Work	School		Health		Comments
			Parent Illness Manag.	Rx Compl. (All that apply)	Jail/Det. Episodes	Jail/Det Days	# Arrests or pick-ups	(List all applicable during month)	(List all applicable during month)	Status (All that apply)	Place-ment	# PCP Contacts during month	Health Status	

Illness Management:

Parent/Guardian . . . .

1 = Primary Management Role- Able to manage youth's illness for most part; utilizes staff and treatment centers as resources
2 = Co-Case Manager Role - Able to work as an equal partner with staff in managing youth's illness
3 = Sees Role in Service/Tx. as Secondary- Participates in managing illness, but mostly relies on staff to manage youth's illness
4 = Problem Recognition/No Role - Recognizes need for treatment, but relies entirely on staff to manage youth's illness
5 = No Problem Recognition/Compliant - Doesn't recognize need for youth's treatment, but is compliant with staff
6 = No Problem Recognition/Resistant - Doesn't recognize need for youth's tx Resists staff and youth's treatment

Medications Compliance:

Youth is . . .

1 = Almost always compliant
2 = Sometimes compliant
3 = Rarely compliant
4 = Not applicable (no Rx)
5 = Not enough information to rate

Parent/guardian . . .

6 = Poorly manages Rx

If in DCS Custody:

1 = Parental rights terminated
2 = No visits
3 = Supervised visits
4 = Overnight visits allowed
5 = Trail placement

Housing:

1 = Inpatient
2 = Residential treatment facility
3 = Group home
4 = Halfway house
5 = Respite care facility
6 = Overnight school
7 = Correctional/Jail/youth detention
8 = Living with parent(s)
9 = Living with relative(s)
10 = Living with friend(s)
11 = Foster home
12 = Independent living, alone
13 = Indep. Living with sig. other
14 = Indep. Living with roommate(s)
15 = Hotel, rooming or boarding house
16 = Homeless – shelter
17 = Homeless – on streets
18 = Other

Work:

1 = Full-time, Independent
2 = Part-time, Independent
3 = Full-time, Supported
4 = Part-time, Supported
5 = Part-time, community transitional, assisted
6 = Non-Paid, volunteer
7 = Receiving formal training
8 = Looking for work
9 = Not interested in work
10 = Quit job
11 = Fired from job
12 = Not applicable (disabled or in school)

School:

Status:

1 = Truancy/attendance problems
2 = Poor grades
3 = Behavior problems
4 = Out-of-school suspension
5 = In-school suspension
6 = Expelled
7 = No problems
8 = Not applicable (not in school)

Placement:

1 = Regular classroom
2 = Home schooled
3 = Alternative school
4 = Adult Ed.
5 = Residential
6 = Special Education
7 = Other
8 = Not applicable

Health Status

1 = In good health
2 = Acute illness, mild/moderate
3 = Acute illness, serious
4 = Chronic health condition, mild impairment
6 = Chronic health condition, moderate impairment
7 = Chronic health condition, serious impairment

Ohio Mental Health Consumer Outcomes System
Ohio Youth Problem, Functioning, and Satisfaction Scales
Parent Rating – Short Form

P

Child's Name: ______________________ Date: ___________ Child's Grade: ____

ID#: ________________
Completed by Agency

Child's Date of Birth: ________________ Child's Sex: ☐ Male ☐ Female Child's Race: ______________

Form Completed By: ☐ Mother ☐ Father ☐ Step-mother ☐ Step-father ☐ Other: ________________

Instructions: Please rate the degree to which your child has experienced the following problems in the past 30 days.	Not at All	Once or Twice	Several Times	Often	Most of the Time	All of the Time
1. Arguing with others	0	1	2	3	4	5
2. Getting into fights	0	1	2	3	4	5
3. Yelling, swearing, or screaming at others	0	1	2	3	4	5
4. Fits of anger	0	1	2	3	4	5
5. Refusing to do things teachers or parents ask	0	1	2	3	4	5
6. Causing trouble for no reason	0	1	2	3	4	5
7. Using drugs or alcohol	0	1	2	3	4	5
8. Breaking rules or breaking the law (out past curfew, stealing)	0	1	2	3	4	5
9. Skipping school or classes	0	1	2	3	4	5
10. Lying	0	1	2	3	4	5
11. Can't seem to sit still, having too much energy	0	1	2	3	4	5
12. Hurting self (cutting or scratching self, taking pills)	0	1	2	3	4	5
13. Talking or thinking about death	0	1	2	3	4	5
14. Feeling worthless or useless	0	1	2	3	4	5
15. Feeling lonely and having no friends	0	1	2	3	4	5
16. Feeling anxious or fearful	0	1	2	3	4	5
17. Worrying that something bad is going to happen	0	1	2	3	4	5
18. Feeling sad or depressed	0	1	2	3	4	5
19. Nightmares	0	1	2	3	4	5
20. Eating problems	0	1	2	3	4	5

(Add ratings together) Total ________

January 2000 (Parent-1)

Instructions: Please circle your response to each question.

1. Overall, how satisfied are you with your relationship with your child right now?
    1. Extremely satisfied
    2. Moderately satisfied
    3. Somewhat satisfied
    4. Somewhat dissatisfied
    5. Moderately dissatisfied
    6. Extremely dissatisfied
2. How capable of dealing with your child's problems do you feel right now?
    1. Extremely capable
    2. Moderately capable
    3. Somewhat capable
    4. Somewhat incapable
    5. Moderately incapable
    6. Extremely incapable
3. How much stress or pressure is in your life right now?
    1. Very little
    2. Some
    3. Quite a bit
    4. A moderate amount
    5. A great deal
    6. Unbearable amounts
4. How optimistic are you about your child's future right now?
    1. The future looks very bright
    2. The future looks somewhat bright
    3. The future looks OK
    4. The future looks both good and bad
    5. The future looks bad
    6. The future looks very bad

Total: ________

Instructions: Please circle your response to each question.

1. How satisfied are you with the mental health services your child has received so far?
    1. Extremely satisfied
    2. Moderately satisfied
    3. Somewhat satisfied
    4. Somewhat dissatisfied
    5. Moderately dissatisfied
    6. Extremely dissatisfied
2. To what degree have you been included in the treatment planning process for your child?
    1. A great deal
    2. Moderately
    3. Quite a bit
    4. Somewhat
    5. A little
    6. Not at all
3. Mental health workers involved in my case listen to and value my ideas about treatment planning for my child.
    1. A great deal
    2. Moderately
    3. Quite a bit
    4. Somewhat
    5. A little
    6. Not at all
4. To what extent does your child's treatment plan include your ideas about your child's treatment needs?
    1. A great deal
    2. Moderately
    3. Quite a bit
    4. Somewhat
    5. A little
    6. Not at all

Total: ________

Instructions: Please rate the degree to which your child's problems affect his or her current ability in everyday activities. Consider your child's current level of functioning.	Extreme Troubles	Quite a Few Troubles	Some Troubles	OK	Doing Very Well
1. Getting along with friends	0	1	2	3	4
2. Getting along with family	0	1	2	3	4
3. Dating or developing relationships with boyfriends or girlfriends	0	1	2	3	4
4. Getting along with adults outside the family (teachers, principal)	0	1	2	3	4
5. Keeping neat and clean, looking good	0	1	2	3	4
6. Caring for health needs and keeping good health habits (taking medicines or brushing teeth)	0	1	2	3	4
7. Controlling emotions and staying out of trouble	0	1	2	3	4
8. Being motivated and finishing projects	0	1	2	3	4
9. Participating in hobbies (baseball cards, coins, stamps, art)	0	1	2	3	4
10. Participating in recreational activities (sports, swimming, bike riding)	0	1	2	3	4
11. Completing household chores (cleaning room, other chores)	0	1	2	3	4
12. Attending school and getting passing grades in school	0	1	2	3	4
13. Learning skills that will be useful for future jobs	0	1	2	3	4
14. Feeling good about self	0	1	2	3	4
15. Thinking clearly and making good decisions	0	1	2	3	4
16. Concentrating, paying attention, and completing tasks	0	1	2	3	4
17. Earning money and learning how to use money wisely	0	1	2	3	4
18. Doing things without supervision or restrictions	0	1	2	3	4
19. Accepting responsibility for actions	0	1	2	3	4
20. Ability to express feelings	0	1	2	3	4

January 2000 (Parent-2)

(Add ratings together) Total ________

CAREGIVER STRAIN QUESTIONNAIRE (CSQ)[1]

Date:____________________ Client ID:______________________

Respondent:
☐ Biological Father ☐ Step Father
☐ Biological Mother ☐ Step Mother
☐ Youth ☐ Foster parent
☐ Grandparent ☐ Other Relative
☐ Other *specify:*___________________________

Please look back over the **past 6 months** and try and remember how things have been going for your family. We are trying to get a picture of how life has been in your household during that time. Please circle the number that goes with the scale at the top of the page.

In the past 6 months, how much of a problem was . . .		**Not at All**	**A Little**	**Some-what**	**Quite a Bit**	**Very Much**
1.	Interruption of personal time resulting from your child's problems?	1	2	3	4	5
2.	Your missing work or neglecting other duties because of your child's problems?	1	2	3	4	5
3.	Disruption of family routines due to your child's problems?	1	2	3	4	5
4.	Any family member having to do without things because of your child's problems?	1	2	3	4	5
5.	Any family member suffering negative mental or physical health effects as a result of your child's problems?	1	2	3	4	5
6.	Your child getting into trouble with neighbors, the community, or law enforcement?	1	2	3	4	5
7.	Financial strain for your family as a result of your child's problems?	1	2	3	4	5
8.	Less attention paid to any family member because of the attention given to your child?	1	2	3	4	5
9.	Disruption or upset of relationships within your family due to your child's problems?	1	2	3	4	5
10.	Disruption of your family's social activities resulting from your child's problems?	1	2	3	4	5

In the past 6 months, how much of a problem was . . .		**Not at All**	**A Little**	**Some-what**	**Quite a Bit**	**Very Much**
11.	How socially isolated did you feel as a result of your child's problems?	1	2	3	4	5
12.	How sad or unhappy did you feel as a result of your child's problems?	1	2	3	4	5
13.	How embarrassed did you feel about your child's problems?	1	2	3	4	5
14.	How well did you relate to your child?	1	2	3	4	5
15.	How angry did you feel toward your child?	1	2	3	4	5
16.	How worried did you feel about your child's future?	1	2	3	4	5
17.	How worried did you feel about your family's future?	1	2	3	4	5
18.	How guilty did you feel about your child's problems?	1	2	3	4	5
19.	How resentful did you feel toward your child?	1	2	3	4	5
20.	How tired or strained did you feel as a result of your child's problems?	1	2	3	4	5
21.	In general, how much a toll has your child's problems had on your family?	1	2	3	4	5

[1] *The CSQ was developed by Brannan, Heflinger, Bickman (1994) and is used by permission.*

APPENDIX B

ADDITIONAL RESULTS TABLES

Table B-1

Modeling Youth Functioning: Predisposing and Enabling Factors

Effect	β	SE(β)	Pr > |t|	Interpretation
Intercept	39.26	1.43	<.001	Functioning score at intake for reference group.
Early Time	1.40	0.35	<.001	Scores for reference group increased 1.4 pts/month.
Late Time	-1.89	0.76	<.01	Slopes changed 1.89 pts/month. Resulting outcome was a decrease in scores of 0.49 pts/month.
Age	0.50	0.21	<.05	Intake score was 0.50 points higher for every year above the M.
Age*Early Time	-0.07	0.06	0.17	Age did not affect Early outcome.
Age*Late Time	0.05	0.12	0.71	Age did not affect Late outcome.
Gender	4.74	1.45	<.01	Girls had intake scores that were 4.74 points higher than boys.
Gender *Early Time	0.01	0.37	0.97	Gender did not affect Early outcome.
Gender *Late Time	-0.54	0.78	0.95	Gender did not affect Late outcome.
Minority Race	-1.19	1.35	0.38	All youth, regardless of race, had the same intake scores.
Custody				
Both biological parents				All youth, regardless of custody arrangements, had the same intake scores.
One biological parent	0.04	1.33	0.98	
Other relative	-0.08	2.19	0.97	
DCS/adoptive	2.81	2.78	0.31	
Custody				
Both biological parents				Custody did not impact Early outcome.
One biological parent	.16	.42	.70	
Other relative	-.38	.54	.48	
DCS/adoptive	.68	.72	.34	
Custody				
Both biological parents				Custody did not impact Late outcome.
One biological parent	.32	.89	.71	
Other relative	1.44	1.05	.17	
DCS/adoptive	-2.49	1.39	.07	

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[1] Reference group: Caucasian boys in the custody of both biological parents with a mean age of 12.2 years.

Table B-2

Modeling Youth Functioning: Pile-up of Stressors

Effect	β	SE(β)	Pr > |t|	Interpretation
Intercept	39.21	0.83	<.001	Functioning score at intake for reference group.[1]
Early Time	1.47	0.18	<.001	Scores for reference group increased 1.50 pts/month during the early phase.
Late Time	-1.67	0.36	<.001	Slope changed 1.73 pts/month. Resulting outcome was a decrease in scores of 0.23 pts/month.
Index of Stressors	-0.12	0.43	0.78	Stressors did not relate to intake score.
Age	0.34	0.21	0.10	Age did not relate to scores at intake.
Gender	4.67	1.27	<.001	Girls had intake scores that were 4.67 pts. higher than boys.
Stressors*Early Time	0.00	0.10	0.95	Stressors did not affect Early outcome.
Stressors*Late Time	-0.08	0.21	0.69	Stressors did not affect Late outcome.

[1] Reference group: Males with a mean age of 12.2 years and a mean Index of Stressors=3.08.

Table B-3

Modeling Youth Symptoms: Parent Caregiver Strain and Attitudes

Effect	β	SE(β)	Pr > |t|	Interpretation
Intercept	36.69	0.83	<.001	Symptom score at intake for reference group.[1]
Early Time	-2.22	0.20	<.001	Scores for reference group decreased 2.22 pts/month.
Late Time	2.51	0.41	<.001	Slope changed 2.51 pts/month. Resulting outcome was an increase in scores of 0.29 pts/month.
Age	-0.96	0.18	<.001	Intake score was 0.96 points lower for every year above the M.
Gender	-1.66	1.24	0.18	Boys and girls had the same scores at intake.
Parent Attitudes	-1.37	0.20	<.001	Intake score was 1.37 pts. less for every point increase in attitudes above the M.
Attitudes*Early Time	0.16	0.06	<.01	Youth with parent hope greater than the M improved at a slower rate.
Attitudes*Late Time	-0.11	0.13	0.40	Hope did not impact Late outcome.
Global Caregiver Strain	1.91	0.367	<.001	Intake score was 1.91 pts. higher for every point increase in Strain above the M.
Strain*Early Time	-0.08	0.11	0.47	Strain did not impact Early outcome.
Strain*Late Time	0.15	0.24	0.53	Strain did not impact Late outcome.

[1] Reference group: Boys with a mean age of 12.2 years, mean parent-reported Global CGSQ=8.75 and mean Attitudes=11.74.

Table B-4

Modeling Youth Symptoms: Service Characteristics

Effect	β	SE(β)	Pr > |t|	Interpretation
Intercept	34.45	2.29	<.001	Symptom score at intake for reference group.[1]
Early Time	-2.97	0.63	<.001	Scores for reference group decreased 2.97 pts/month.
Late Time	4.02	1.32	<.01	Slope changed 4.02 pts/month. Resulting outcome was an increase in scores of 0.29 pts/month.
Age	-1.08	0.21	<.001	Intake score was 1.08 points lower for every year above the M.
Gender	-1.47	1.40	.30	Boys and girls had the same intake scores.
Length of Stay	0.34	0.15	<.05	Youth with LOS > M had higher scores at intake.
Service Diversity	0.53	0.87	0.54	Diversity did not relate to intake score.
Diversity*Early Time	0.11	0.24	0.65	Diversity did not impact Early outcome.
Diversity*Late Time	-0.50	0.50	0.32	Diversity did not impact Late outcome.
Frequency/Month	0.51	0.36	0.16	Frequency did not relate to intake score.
Frequency*Early Time	0.24	0.10	<.05	Youth with more contacts/month improved slower.
Frequency*Late Time	-0.26	0.24	0.28	Frequency did not impact Late outcome.
Team (4 is reference)				
Team 1	-3.05	3.63	0.40	Intake scores did no vary across teams.
Team 2	3.98	3.21	0.21	
Team 3	0.30	2.03	0.88	
Team 5	3.08	2.08	0.14	

Table B-4 Continued

Effect	β	SE(β)	Pr > |t|	Interpretation
Team*Early Time				
Team 1	1.60	1.59	0.32	
Team 2	-0.12	1.28	0.92	Early outcome did not vary by team.
Team 3	0.63	0.56	0.27	
Team 5	0.29	0.57	0.61	
Team*Late Time				
Team 1	-1.61	4.19	0.70	
Team 2				Late outcome did not vary by team.
Team 3	0.23	1.09	0.84	
Team 5	-0.39	1.36	0.77	

[1] Reference group: Boys with a mean age of 12.2 years, on Team 5, with a LOS of 6.6 months, receiving case management only, and a frequency of 10 contacts/month.

Table B-5

Modeling Youth Functioning: Service Characteristics

Effect	β	SE(β)	Pr > |t|	Interpretation
Intercept	40.55	2.00	<.001	Symptom score at intake for reference group.[1]
Early Time	1.87	0.54	<.001	Scores for reference group increased 1.87 pts/month.
Late Time	-2.59	1.13	<.05	Slope changed 2.59 pts/month. Resulting outcome was an decrease in scores of 0.72 pts/month.
Age	0.26	0.18	0.16	Age did not relate to intake score.
Gender	5.55	1.23	<.001	Girls' intake scores were 5.55 points higher than boys.
Length of Stay	-0.39	0.14	<.01	Youth with LOS > M had lower scores at intake.
Service Diversity	-0.44	0.75	0.56	Diversity did not relate to intake score.

Table B-5 Continued

Diversity*Early Time	-.06	0.20	0.77	Diversity did not impact Early outcome.
Diversity*Late Time	0.42	0.43	0.33	Diversity did not impact Late outcome.
Frequency/Month	-0.70	0.32	<.05	Youth with contacts/month > M had lower (worse) scores at intake.
Frequency*Early Time	-0.07	0.09	0.48	Frequency did not impact Early outcome.
Frequency*Late Time	-0.20	0.21	0.34	Frequency did not impact Late outcome.
Team (4 is reference)				
Team 1	-1.67	1.82	0.60	Intake scores did no vary across teams.
Team 2	-5.06	3.16	0.07	
Team 3	-1.88	2.83	0.29	
Team 5	0.72	1.13	0.69	
Team*Early Time				
Team 1	0.87	1.46	0.55	Early outcome did not vary by team.
Team 2	0.60	1.10	0.59	
Team 3	-0.33	0.48	0.49	
Team 5	-0.31	0.49	0.53	
Team*Late Time				
Team 1	-6.37	5.12	0.21	Late outcome did not vary by team.
Team 2				
Team 3	-0.42	0.93	0.65	
Team 5	0.11	1.17	0.92	

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[1] Reference group: Boys with a mean age of 12.2 years, on Team 5, with a LOS of 6.6 months, receiving case management only, and a frequency of 10 contacts/month.

Table B-6

Parent Involvement as a Moderator of Youth Functioning [1]

Effect	β	SE(β)	Pr > |t|	Interpretation
Intercept	39.55	1.06	<.001	Symptom score at intake for reference group.[2]
Early Time	0.99	0.30	<.01	Scores for reference group increased 0.99 pts/month during Early Time.
Late Time	-0.52	0.65	0.43	Change in outcome in Time Late was not significant. [3]
Age	0.20	0.19	0.29	Age did not relate to intake score.
Gender	5.48	1.18	<.001	Girls intake score was 5.48 points higher than boys.
Parent Involvement	-1.13	1.33	0.40	Involvement did not relate to the intake score.
Involvement*Early Time	0.73	0.38	0.054	Involvement did not impact Early outcome.
Involvement*Late Time	-1.68	0.79	<.05	Youth demonstrated more relapse in Late outcome when parent involvement was high.
Global Caregiver Strain	-2.34	0.29	<.001	Intake score was 2.34 points lower for every point above the M.
Strain*Early Time	-0.03	0.15	0.82	Strain did not impact Early Time.
Strain*Late Time	-0.07	0.34	0.83	Strain did not impact Late Time.
Pile-up of Stressors	-0.14	0.41	0.72	Intake scores did not relate to Pile-up.
Stressors*Early Time	0.09	0.17	0.59	Stressors did not impact Early Time.
Stressors*Late Time	-0.45	0.38	0.23	Stressors did not impact Late Time.

Table B-6 Continued

Effect	β	SE(β)	Pr > |t|	Interpretation
Involvement *Stressors*Early Time	-0.14	0.19	0.46	Involvement and Stressors did not interact to impact Early Time.
Involvement *Caregiver Strain*Early Time	-0.03	0.15	0.82	Involvement and Strain did not interact to impact Early Time.
Involvement*Stressors* Late Time	0.52	0.44	0.24	Involvement and Stressors did not interact to impact Late Time.
Involvement*Caregiver Strain*Late Time	-0.07	0.34	0.83	Involvement and Strain did not interact to impact Late Time.

[1] Parent involvement was dichotomized, low and high (cf. Barron & Kenny, 1986, p. 1175).

[2] Reference group: Boys with a mean age of 12.2 years, low Parent Involvement, mean Stressors=3.08, mean CGSQ=8.75, and mean parent Attitudes=11.74.

[3] Losing the significance of time often suggests model is overfitted. The results should be interpreted with caution.

Table B-7

Full Modeling Predicting Youth Symptoms (SPSS Output)

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	36.309	2.237	739.913	16.23	.00
time_early	-3.242	.655	689.046	-4.95	.00
time_late	2.993	1.466	682.878	2.04	.04
Age_c	-1.207	.239	760.947	-5.06	.00
[sex=0]	-.921	1.463	761.912	-.63	.53
[sex=1]	.000(a)	.000	.	.	.
[racemin=0]	1.325	1.321	433.551	1.00	.32
[racemin=1]	.000(a)	.000	.	.	.
[custody=1]	-1.456	2.940	753.067	-.50	.62
[custody=2]	.323	2.256	745.406	.14	.89
[custody=3]	.230	1.637	756.702	.14	.89
[custody=4]	.000(a)	.000	.	.	.
pileupr_c	-.393	.464	766.026	-.85	.40
gsin_c	1.782	.362	757.721	4.92	.00
pattin_c	-1.437	.197	752.832	-7.31	.00
time_early * pileupr_c	-.183	.129	669.322	-1.42	.16
time_late * pileupr_c	1.085	.288	648.345	3.77	.00
freqmnth_c	.149		764.536	.47	.64
los_c	.370	.135	495.118	2.75	.01
srvsdiv_c	-.050	.732	747.383	-.07	.95
Age_c * time_early	.060	.067	645.309	.89	.37
Age_c * time_late	.215	.147	651.547	1.46	.15
time_early([sex=0])	-.769	.418	646.953	-1.84	.07
time_early([sex=1])	.000(a)	.000	.	.	.
time_late([sex=0])	1.599	.929	642.316	1.72	.09
time_late([sex=1])	.000(a)	.000	.	.	.
time_early * pattin_c	.150	.059	655.252	2.55	.01
time_late * pattin_c	-.071	.129	685.683	-.55	.58
time_early * gsin_c	-.104	.114	678.203	-.92	.36

Table B-7, Continued

Parameter	Estimate	Std. Error	df	t	Sig.
time_late * gsin_c	.271	.260	694.186	1.04	.30
time_early([custody=1])	-.182	.853	621.403	-.21	.83
time_early([custody=2])	1.372	.620	660.097	2.21	.03
time_early([custody=3])	.663	.466	654.530	1.42	.16
time_early([custody=4])	.000(a)	.000	.	.	.
time_late([custody=1])	3.394	1.754	651.494	1.94	.05
time_late([custody=2])	-2.132	1.243	658.490	-1.72	.09
time_late([custody=3])	-.636	1.002	646.149	-.63	.53
time_late([custody=4])	.000(a)	.000	.	.	.
time_early * freqmnth_c	.328	.097	687.466	3.36	.00
time_early * srvsdiv_c	.199	.205	694.668	.97	.33
time_late * freqmnth_c	-.585	.237	679.863	-2.47	.01
time_late * srvsdiv_c	-.140	.429	688.795	-.33	.74

a This parameter is set to zero because it is redundant.
b Dependent Variable: Symptoms.

Table B-8

Full Modeling Predicting Youth Functioning (SPSS Output)

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	38.956	1.960	725.307	19.87	.00
time_early	1.928	.565	668.835	3.41	.00
time_late	-1.882	1.265	666.007	-1.49	.14
Age_c	.278	.210	748.053	1.32	.19
[sex=0]	5.612	1.288	748.960	4.36	.00
[sex=1]	.000(a)	.000	.	.	.
[racemin=0]	-2.160	1.173	441.811	-1.84	.07
[racemin=1]	.000(a)	.000	.	.	.
[custody=1]	-3.396	2.600	747.236	-1.31	.19
[custody=2]	-2.633	1.982	732.602	-1.33	.18
[custody=3]	-.941	1.439	744.578	-.65	.51

Table B-8 Continued

Parameter	Estimate	Std. Error	df	t	Sig.
[custody=4]	.000(a)	.000	.	.	.
pileupr_c	-.011	.408	753.545	-.03	.98
gsin_c	-.890	.319	748.271	-2.78	.01
pattin_c	1.610	.173	739.372	9.32	.00
time_early * pileupr_c	-.006	.111	659.077	-.06	.95
time_late * pileupr_c	-.492	.249	636.246	-1.98	.05
freqmnth_c	-.635	.279	753.414	-2.28	.02
los_c	-.520	.119	498.311	-4.36	.00
srvsdiv_c	.648	.642	734.172	1.01	.31
Age_c * time_early	-.084	.058	638.105	-1.45	.15
Age_c * time_late	.005	.128	638.775	.04	.97
time_early([sex=0])	.085	.360	637.021	.24	.81
time_early([sex=1])	.000(a)	.000	.	.	.
time_late([sex=0])	-.223	.800	627.184	-.28	.78
time_late([sex=1])	.000(a)	.000	.	.	.
time_early * pattin_c	-.172	.050	646.738	-3.42	.00
time_late * pattin_c	.157	.113	653.353	1.38	.17
time_early * gsin_c	-.036	.098	671.018	-.36	.72
time_late * gsin_c	.024	.226	680.827	.11	.92
time_early([custody=1])	1.015	.728	619.883	1.39	.16
time_early([custody=2])	-.184	.536	652.095	-.34	.73
time_early([custody=3])	.155	.403	644.823	.38	.70
time_early([custody=4])	.000(a)	.000	.	.	.
time_late([custody=1])	-4.196	1.518	623.655	-2.76	.01
time_late([custody=2])	.883	1.073	646.968	.82	.41
time_late([custody=3])	.085	.866	635.074	.10	.92
time_late([custody=4])	.000(a)	.000	.	.	.
time_early * freqmnth_c	-.094	.084	681.284	-1.11	.27
time_early * srvsdiv_c	-.164	.177	670.008	-.93	.35
time_late * freqmnth_c	-.001	.205	666.638	.00	1.00
time_late * srvsdiv_c	.184	.370	669.370	.50	.62

a This parameter is set to zero because it is redundant.
b Dependent Variable: Functioning.

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