Juvenile Offenders With Mental Health Needs: Reducing Recidivism Using Wraparound

Michael D. Pullmann, Jodi Kerbs, Nancy Koroloff, Ernie Veach-White, Rita Gaylor and Dede Sieler

Crime Delinquency 2006; 52; 375
DOI: 10.1177/0011128705278632

Juvenile Offenders with Mental Health Needs: Reducing Recidivism Using Wraparound

Michael D. Pullmann
Jodi Kerbs
Nancy Koroloff
Ernie Veach-White
Rita Gaylor
DeDe Sieler

The rate of youth with mental health needs is disproportionately high in juvenile justice. Wraparound planning involves families and providers in coordinating juvenile justice, mental health, and other services and supports. This study compares data from two groups of juvenile offenders with mental health problems: 106 youth in a juvenile justice wraparound program called Connections and a historical comparison group of 98 youth in traditional mental health services. Cox regression survival analyses revealed that youth in Connections were significantly less likely to recidivate at all, less likely to recidivate with a felony offense, and served less detention time.

Keywords: *juvenile justice; mental health; recidivism; system of care; wraparound; serious emotional disorder; Cox regression; adolescent*

It is widely acknowledged that the percentage of youth with mental illness in the juvenile justice system is disproportionately high. Although the exact number of juvenile offenders with mental illness is unknown, it is clear that the rate is higher than in the general population of adolescents (Boesky,

MICHAEL PULLMANN: Center for Evaluation and Program Improvement at Vanderbilt University. **JODI KERBS**: Regional Research Institute for Human Services at Portland State University. **NANCY KOROLOFF**: Regional Research Institute for Human Services; Graduate School of Social Work at Portland State University. **ERNIE VEACH-WHITE**: Juvenile Court Administrator in Clark County, Washington. **RITA GAYLOR**: Juvenile Services Manager at the Clark County Juvenile Department. **DEDE SIELER**: Youth Program Manager at the Clark County Department of Community Services.

This project was based on work partially funded by the Center for Mental Health Services and Substance Abuse and Mental Health Services Administration (Grant No. 6HS5SM52262-01). The views in this article do not necessarily reflect the views of Center for Mental Health Services or Substance Abuse and Mental Health Services Administration. The authors wish to thank Ana Maria Brannan, Cheri Dolezal, John Franz, Heidi Herinckx, and the anonymous reviewers for their extremely helpful comments on earlier versions of this article.

CRIME & DELINQUENCY, Vol. 52 No. 3, July 2006 375-397
DOI: 10.1177/0011128705278632

2002). Several studies provide estimates of the scope of the problem. The rate of youth in the juvenile justice system who qualify as having a serious mental health disorder is estimated at 20% (Cocozza & Skowyra, 2000; Goldstrom, Jaiquan, Henderson, Male, & Mandersheid, 2000), which is double the estimated rate in the general youth population (Friedman, Katz-Leavy, Mandersheid, & Sondheimer, 1996). A study in Cook County, Illinois, found that excluding conduct disorder, 60% of males and 68% of females in juvenile detention met the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev) diagnostic criteria and had diagnosis-specific functional impairment for one or more psychiatric disorders (Teplin, Abram, McClelland, Dulcan, & Mericle, 2002). These included affective disorders, anxiety disorders, psychosis, attention-deficit and hyperactivity disorder, and substance use disorders. A more recent study found that including conduct disorders, 67% of those in juvenile facilities met the diagnostic criteria for one or more psychiatric disorders (Wasserman, Ko, & McReynolds, 2004). Another study found that 31% of all youth arrested had some history with the public mental health system, and during the course of 38 months, 20% of the youth receiving public mental health services were arrested (Rosenblatt, Rosenblatt, & Biggs, 2000). Children receiving public mental health services in King County, Washington, were nearly three times more likely to be referred to juvenile justice than similar youth (Vander Stoep, Evens, & Taub, 1997). In another study, Breda (1995) found that 83% of youth that exhibited serious delinquent behaviors also had a clinical level of mental disorder.

Although a substantial percentage of the juvenile justice population is made up of youth with mental health problems and, likewise, youth with mental health problems are at a high risk of entering juvenile justice, the mental health and juvenile justice systems are ill-equipped to handle youth with co-occurring delinquent behaviors and mental health problems. Juvenile justice administrators and staff members observe that these youth place an extreme hardship on their system. Mental health agencies do not believe that they have adequate security to handle such youth (Fagan, 1991). Regardless, because of a lack of available and accessible mental health programs, in many regions of the country, the juvenile justice system has become the default mental health service provider for youth with severe problems (Goldstrom et al., 2000; Murphy, 2002). However, mental health services are not typically available in juvenile justice settings. A national survey found that less than half of juvenile justice settings provided access to mental health services beyond screening and medication management (Goldstrom et al., 2000). Breda (2001) found that juvenile courts in Tennessee referred only 3.2% of youth to formal services, and a study in southern California found only 6% of youth in detention were referred to mental health services (Rogers, Zima, Powell, & Pumariega, 2001).

There is broad agreement that multiagency collaboration among child-serving agencies (including mental health, juvenile justice, education, and others) is required to overcome the limitations of unilateral treatment—that is, treatment provided through one agency without coordination with other service providers—and provides the array of services needed to effectively treat offenders with mental health needs (Borduin, 1994; Cocozza & Skowyra, 2000; Fagan, 1991; Goldstrom et al., 2000; Murphy, 2002). Unfortunately, major barriers to collaboration exist. These include the high cost of specialized mental health interventions (Fagan, 1991), categorical funding at federal, state, and local levels (Goldstrom et al., 2000), and differing philosophies in juvenile justice and mental health. Although both systems grew out of the child guidance movement and were based on similar rehabilitative ideals (Murphy, 2002), the juvenile justice system has the added responsibility of protecting young offenders and the communities in which they live. The emphasis on public safety and protection intensified in the 1980s and 1990s, resulting in a get-tough approach to crime that conflicts with the treatment philosophy of mental health services (Butts & Mears, 2001). This philosophy has repeatedly been shown to be ineffective at rehabilitation or crime prevention, except for the period of time while the offender is in a secure setting (Chaiken, 1998; Moon, Applegate, & Latessa, 1997; Murphy, 2002).

Existing Interventions

Novel approaches to treating delinquency include get-tough practices such as mandatory adult sentencing, increased sentencing lengths, scared-straight programs, and boot camps. Other unique approaches include non-system diversion, residential corrections, behavioral interventions, and peer-based programs. The research shows that these approaches do not rehabilitate youth, show no deterrent effect, or in some cases actually exacerbate recidivism (Borduin, 1994; Butts & Mears, 2001; Chaiken, 1998; Murphy, 2002; Whitehead & Lab, 1989). Get-nice approaches such as after-school hangouts, sports programs, peer mediation, self-esteem programs, and providing information about the negative impact of delinquency have little empirical support (Chaiken, 1998).

Few studies exist that specifically examine programs to treat youth in juvenile justice with mental health problems. It is probable that the complexity of co-occurring mental health problems and delinquent behavior would make rehabilitation programs for this population more prone to failure than programs for the general juvenile justice population. However, recently, there have been significant developments in the treatment of juvenile offend-

ers and a number of innovative interventions have emerged with promising results.

Effective interventions often have an ecological approach, focusing on increased intersystem collaboration and comprehensive service planning in multiple domains (Goldstrom et al., 2000). Programs with interventions encompassing individual, parent, family, and community systems and that address the multiple determinants of delinquency have demonstrated effectiveness for reducing symptomatology, criminal activity, and recidivism (Lipsey, 1995; Lipsey, Wilson, & Cothern, 2000; Murphy, 2002). Additionally, emerging criminological theory emphasizes the importance of social support in preventing crime (Colvin, Cullen, & Vander Ven, 2002). Programs with demonstrated effectiveness that combine an ecological approach with an element of social support include multisystemic therapy (MST) (Henggeler, Melton, Brondino, Scherer, & Hanley, 1997; Henggeler, Melton, Smith, Schoenwald, & Hanley, 1993), functional family therapy (FFT; Sexton & Alexander, 2000), and wraparound-service planning.

Wraparound-service planning refers to a process of organizing and coordinating service delivery for children and families with complex needs involved with multiple service providers. These services might include clinical therapy, substance use treatment, special education, medication, caregiver support, public assistance, employment, housing, medical health care, mentorship programs, transportation, and coordination of services with other sectors such as juvenile justice and child welfare. Wraparound has been embraced as a tool for individualized service planning by communities implementing a system of care for youth with severe mental health issues. The system of care philosophy emphasizes community-based, culturally competent, integrated, comprehensive services provided in the least restrictive environment and with the full participation of the child's family (Stroul & Friedman, 1986). Ten guiding principles have been identified as key elements related to wraparound (Goldman, 1999) and these principles have been expanded and refined by a group of nationally recognized wraparound experts (Bruns et al., 2004). These expanded principles include conducting a team-driven treatment planning process that includes caregivers, children, agencies, and community services; prioritizing family voice and choice; providing individualized, strengths-based services across life domains; using natural supports such as friends, extended family, and neighbors; and using flexible approaches with adequate funding.

Our research focuses on a mental health wraparound program based within juvenile justice. Research on wraparound programs in the juvenile justice system is sparse. We were able to uncover only three wraparound programs that served youth with juvenile delinquency and have published infor-

mation about their effectiveness. Wraparound Milwaukee is a program for youth in juvenile probation or child welfare services. Youth in this program experienced improved functioning across a number of domains (Kamradt, 2000; Kamradt & Meyers, 1999); they demonstrated a reduction in recidivism and an improvement in clinical outcomes, and the use of residential treatment and psychiatric hospitalization dropped dramatically, as did the average overall cost of care. However, because youth become eligible for the program because of their extreme emotional and behavioral problems and because the sample consisted of a high percentage of youth referred through the juvenile court (65%), a drop in recidivism rates over time is likely to occur because of a regression to the mean. A comparison group was not employed to account for this.

Another wraparound program based in Columbus, Ohio, and largely focused on a juvenile justice population also demonstrated positive outcomes (Carney & Buttell, 2003). This program was called the Juvenile Delinquency Task Force Implementation Committee, and it was a 3-year demonstration project that worked with youth referred to juvenile court or child services for delinquency or unruly behavior. Youth were not required to have mental health issues, and only 21% were involved in the mental health system. Participants were randomly assigned to wraparound planning team services or conventional services. The only difference between the treatment conditions was wraparound team planning—those in the conventional services group still had access to a wide array of services including counseling, drug treatment, mentoring programs, and more. Those in the wraparound services group experienced positive outcomes relative to the conventional services group, including better educational outcomes, reduction of running away from home, and less contact with the police. However, there were no differences between the groups on recidivism as measured by subsequent offenses, arrests, or incarceration.

Third, the Dawn Project in Indiana implemented wraparound planning as part of an overall system of care for children with serious emotional and behavioral challenges. Preliminary findings revealed a statistically significant drop in recidivism rates for those youth who completed the program (Anderson, Wright, Kooreman, Mohr, & Russell, 2003). However, this specific finding is unpersuasive for several reasons. First, only 10 youth entered the study through juvenile detention. Second, the researchers did not include 31% of the original sample in the analysis because these youth left the program prematurely—thus, youth unlikely to have positive outcomes were selected out of the analysis. Third, there was no comparison group to control for likely error. Despite the limitations in all of these studies, this research revealed the potential of wraparound services. Given the promising, but lim-

ited, findings of wraparound planning in juvenile justice, the purpose of this study is to extend our knowledge about the impact of integrated wraparound service planning on youth recidivism in juvenile justice.

Program Description

In 1998, Clark County, Washington, received the Comprehensive Community Services for Children and Their Families Program grant from the federal Center for Mental Health Services within the Substance Abuse Mental Health Services Administration. The system-of-care grant supports efforts to fashion an integrated, seamless, coordinated system for children with mental health problems. A wide array of mental health services were developed or enhanced in the county, including a new crisis stabilization program, a new parent partners program, a family support and training organization, increased access to flexible funding, the establishment of regular interagency meetings, and a redesign of the overall service delivery system. Simultaneous to these efforts, concern was building about the number of youth in juvenile justice with behavioral and mental health issues. Additionally, the board of county commissioners expressed increased interest in crime and justice issues, including passing a new sales tax that resulted in additional funds for the justice system with 10% of the revenue dedicated to juvenile justice. Recognizing that the system of care approach fit with the mission of the Juvenile Court to respond to juvenile crime in a manner that considers the well-being of the entire community, administrators began to consider how the two systems might be coordinated.

To explore the extent of the need for system collaboration between the county mental health and juvenile justice departments, the juvenile justice department identified the top users of detention during the previous year. This revealed that 20% of the youth in juvenile justice used 60% of the detention days. The youth that comprised this top 20% were compared to the records of all youth who received services in the public mental health system in the same year. There was a large number of dually served youth: Of the top users of detention, 70% (110 youth) had a mental health diagnosis and had received some form of public mental health services in the same year. The unique needs of these youth formed the basis for developing a collaborative juvenile justice and mental health program named Connections. After planning with stakeholders and families, Connections officially began serving youth in October 2001.

Connections is a community-based program designed to address the needs of juvenile offenders with emotional and behavioral disorders and their families. It employs a strength-based wraparound approach to link youth and

families to local resources to better meet their individual needs. Balanced and restorative justice principles and values (Bazemore & Walgrave, 1999) are incorporated in plans to increase youth's skills, provide services to victims and increase public safety. The budget for the 1st year of the program was approximately $1 million, which came from blending juvenile court general funds (72%) with a combination of county mental health dollars and system of care grant funds (27%). The project began with four teams that each worked with 30 families at a time. It quickly became clear that this was too burdensome and the number was reduced to 25 families per team. During the 1st year of the program, 164 youth were served.

Prior to the implementation of the program, staff members received a 3-day training with several nationally recognized wraparound trainers (Miles, 2000), which included an overview of the wraparound philosophy, individualized strengths-based planning, and reviewed the process of developing creative, needs-driven plans with families. Connections staff people also received follow-up trainings and consultation approximately every other month or as needed, and supervisory staff members and colleagues provided regular feedback.

The teams comprise a mental health professional serving as a care coordinator, a family assistance specialist, a probation counselor, and a juvenile services associate. The mental health care coordinator facilitates wraparound team meetings with youth, family, and team members to identify strengths, determine needs, and locate or create services and supports. The family assistance specialist positions are each staffed by a caregiver of a child that has been in the juvenile justice and mental health system. They provide emotional and practical support, often by helping the family prepare for meetings or accompanying them through court proceedings. They also help families connect with natural support systems. The family assistance specialist and the mental health care coordinator positions are both available 24 hours a day, 7 days a week.

The probation counselor's primary responsibility is to ensure that services promote community safety, and they are responsible for ongoing supervision of court orders. The juvenile services associates work closely with youth to assist them in completing requirements of the treatment plan. They also work as mentors, often accompanying youth in the community to activities. A staff clinical psychologist provides 20 hours per week to the program, performing psychological evaluations, staffing cases, and counseling youth. Connections contracts out for psychiatric services including medication management.

Youth are referred to the Connections program by any juvenile justice staff person. Criteria for admission include having 6 months or more proba-

tion time remaining, having a diagnosed or diagnosable behavioral health disorder, receiving services in more than one system, and being assessed as having a moderate to high risk to reoffend as determined by their score on the Washington State Juvenile Court Assessment (Washington State Institute for Public Policy, 2004). Following an initial review by the Connections program manager, all referrals are also considered by the care coordinators and the clinical psychologist to ensure the youth meets criteria, the family is interested in participating in the program, and that there are no extenuating circumstances that would make them unfit for the program (such as being in an extreme psychiatric crisis). An initial wraparound team meeting occurs within 30 days of intake.

The child and family teams meet at least once a month or as often as necessary depending on the needs and circumstances of the youth and family. To access an array of individualized services, each child and family team may request flexible funds. Flexible funds are used when a purchase cannot be made with established county funds and when all other possible funding sources are exhausted. These funds are used for nontraditional services such as general equivalency diploma testing, respite care, clothing, or transportation. Requests for flexible funds must be agreed to by the wraparound team and approved by the project manager. Flexible funds are available through a line item in Connections's blended budget, described earlier. Youth are generally discharged from Connections when their probationary period is completed. Transition out of Connections begins 3 months prior to discharge to ensure youth and families are connected with community service providers and other necessary resources.

We hypothesize that when compared to youth in juvenile justice who received mental health services provided through public mental health and not coordinated with the juvenile justice system, youth in juvenile justice who experienced integrated and individualized services and wraparound planning through Connections will (a) be less likely to recidivate with any type of offense, (b) take longer to recidivate with any type of offense, (c) be less likely to recidivate specifically with a felony offense, (d) take longer to recidivate specifically with a felony offense, and (e) will serve less detention time. Hypotheses 3 and 4 are included because felony offenses may be more accurate indicators of delinquent behavior. In Clark County, the decision to charge a youth with a misdemeanor is made by the youth's probation counselor and it is possible that the probation counselors working within Connections may treat youth differently than probation counselors not in Connections. Felony offenses in Clark County, however, are referred to a prosecutor for filing decisions and, thus, may be a more objective indicator of youth delinquency.

Recidivism

A primary goal of juvenile justice systems is to reduce recidivism. However, recidivism is inconsistently defined and measured in the literature (Latimer, 2001; Whitehead & Lab, 1989). It is generally defined as repeated crime, but studies offer different approaches to measuring crime. For example, researchers have measured it as the number of offenses within a time frame (Myner, Santman, Cappelletty, & Perlmutter, 1998); a dichotomous measure of any criminal reoffense during a time period (Sharkey, Furlong, Jimerson, & O'Brien, 2003); a dichotomous measure of any postcommitment referral to corrections (Ashford & LeCroy, 1990; Quist & Matshazi, 2000); patterns of arrest frequency (Lattimore, MacDonald, Piquero, Linster, & Visher, 2004); a measure of no, one, or multiple returns to juvenile court or detention (Niarhos & Routh, 1992); and length of time until arrest (Borduin et al., 1995; Connor, Phan, & Stephens, 2003; Mears & Kelly, 2002; Weisz, Walter, Weiss, Fernandez, & Mikow, 1990). In this study, we measure the number of days between entry into the program and a substantiated subsequent offense.

Method

Participants

This analysis compares a sample of 98 youth from a historical comparison group with an intervention group of 106 youth in Connections. Originally, the comparison group was made up of 110 youth who were identified as being served in both the juvenile justice system and mental health system and who provided the impetus for the development of Connections. Of the originally identified group of 110, 98 did not become a part of Connections because they aged out of services, were discharged from probation, moved out of the county, or had other significant changes during the 21 months between identification and program development. This group of 98 youth constitutes the historical comparison group. The other 12 youth entered Connections when it was developed and were included, along with new referrals to form an intervention group of the first 106 youth who entered the Connections program.

To ensure that there was as long a follow-up period as possible on the group of youth in Connections in this analysis, we included youth that entered Connections during the first 2 months of the program. This allowed at least 790 days of follow-up data for both groups. For this analysis, the final

TABLE 1: Chi-Square Tests and *t* Tests Comparing Descriptive Information

	Connections (n = 106)		*Comparison (n = 98)*			
Variable	M	SD	M	SD	t	p
Age at identification	15.4	1.4	15.0	1.2	2.1	.038
Age of first offense	13.2	1.5	13.5	1.5	–1.2	.249
Number of offenses prior to identification	4.2	2.6	3.2	2.7	2.7	.008
	n	%	n	%	χ^2	p
Race (White)	93	88	87	89	.05	.82
Gender (male)	76	72	65	66	.69	.41

NOTE: Relationships are considered significant below a *p* critical of .01 due to Bonferroni correction.

number of youth in Connections with complete data was 106. Of that number, at the time of analysis, 95 youth had been discharged from Connections and 11 were still in Connections. The mean number of days that these youth were in Connections before discharge was 335 and ranged from 30 to 736 days.

To verify comparability, data from the two groups were compared on variables that have been related to recidivism in previous studies. These include age, race, gender, number of offenses, and age at first offense (Myner et al., 1998; Niarhos & Routh, 1992; Quist & Matshazi, 2000). Chi-square or *t* tests were used for these analyses. A Bonferroni correction for the five tests adjusted the original *p* value significance level of .05 down to .01. Race was divided into White or other race because of the very small number of youth of color in our sample.

Table 1 depicts the comparisons. When compared, age, race, gender, and age at first offense were not significantly different at the Bonferroni-adjusted *p* value of .01. The difference between the two groups in number of prior offenses was significant ($t = 2.7$, $p < .01$). On average, youth in Connections had one more offense than youth in the comparison group, prior to identification. Age of first offense was close to statistical significance but with an average difference of less than 5 months was considered unimportant.

Data

All data were extracted from the juvenile justice management information system that contains the records of all juvenile court–referred youth in Clark County. Most variables were chosen because they had been documented to be related to recidivism (Cottle, Lee, & Heilbrun, 2001; Myner et al., 1998;

Niarhos & Routh, 1992; Quist & Matshazi, 2000; Sharkey et al., 2003) and there were data available in the management information system.

Predictor variables included *intervention group* (Connections or comparison), *gender*, *race* (White versus other race), *age at first substantiated offense*, *age at identification*, and *number of offenses prior to identification*. Race was dichotomous because of the small number of youth of color. For youth in Connections, date of identification is the date of service entry into Connections. For youth in the comparison group, date of identification is the date that youth were identified as dually served by mental health and juvenile justice.

The outcome variable, *recidivism*, was measured in two ways: first, the number of days between identification and any type of subsequent substantiated offense including probation violations, misdemeanors, and felonies; second, the number of days between identification and a substantiated felony offense.

For our last hypothesis, we included the number of unique detention episodes and the number of days of detention.

Analysis

Cox regression time-to-event analyses (also referred to as survival analyses, hazard modeling, or event history analyses) were used to determine significant predictors of time after identification until any substantiated offense. Cox regression calculates a probability of reoffending for every day between identification and reoffense and uses these probabilities to calculate a hazard function (Landau, 2002; Luke & Homan, 1998). Similar to linear regression, it can calculate the predictive relationships of covariates. However, time-to-event analyses account for right-censored data or data that are partially missing because the event had not occurred by the time the participant was lost to follow-up or by the end of the study. The case can be included for calculating proportional hazards up to the day censored. Recidivism data are generally restricted by range—in our analyses, a case was censored at the day the youth turned 18 years old if he or she had not had a substantiated reoffense at that time.

After the first model, diagnostics were used to test for statistical assumptions, and if assumptions were violated, then cases were omitted and the model was run again. Finally, a second Cox regression was run using only felony offenses (felony offenses are referred to the prosecutor for filing decisions).

A chi-square test was performed to determine if there was a significant difference between the Connections group and the comparison group in the

TABLE 2: Time Until Any Offense, Final Cox Regression Model

	B	SE	*Wald*	df	p	*Exp(*B*)*
Group (comparison)	1.032	.177	33.931	1	< .0001	2.806
Gender (male)	0.402	.193	4.368	1	.037	1.495
Race (non-White)	0.220	.255	0.745	1	.388	1.247
Number of offenses prior to identification	0.045	.040	1.242	1	.265	1.046
Age of first offense	0.082	.079	1.095	1	.295	1.086
Age at identification	–0.132	.088	2.261	1	.133	0.876

NOTE: $\chi^2(204, 6) = 46.73$, $p < .0001$.

proportion of youth that had to serve any days of detention. Out of those youth that served any detention, *t* tests were performed to compare the groups on the total number of days in detention, the total number of detention episodes, and the average number of detention days per episode.

Results

First Regression—Any Type of Offense

Using the predictor variables mentioned above, a Cox regression model was significant in predicting number of days after identification until any type of offense ($\chi^2[204, 6] = 46.73$, $p < .0001$). Observation of the predictor variables (see Table 2) indicated that intervention group and gender predicted time until offense and that age at identification, age at first arrest, number of prior arrests, and ethnicity were not significant predictors. Youth in the comparison group were 2.8 times more likely to commit an offense than youth in Connections (*exp[B]* = 2.81, $p < .0001$). Boys were 1.5 times more likely to commit an offense than girls (*exp[B]* = 1.50, $p = .037$). Figure 1 depicts the survival curve. The median number of days until offense for youth in Connections was 344; for the comparison group, it was 104. Diagnostics were performed to examine possible violations of assumptions of proportional hazards and undue influence, including examination of partial residual plots (for continuous variables), log minus log plots (for categorical variables), and *df* beta plots (Landau, 2002; Luke & Homan, 1998). Assumptions were not violated.

Second Regression—Felony Offense

A second Cox regression model was significant in predicting number of days until felony offense ($\chi^2[204, 6] = 38.40$, $p < .0001$). Observation of the

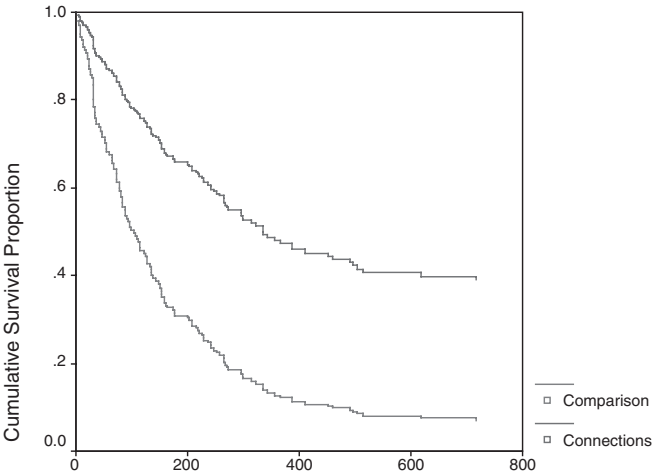

Figure 1: Predicted Time to Any Offense for Connections and Comparison Groups

predictor variables also indicated that intervention group and gender predicted time until felony offense and that age at identification, age at first arrest, number of prior arrests, and ethnicity were not significant. Diagnostics were performed to examine possible violations of the assumption that hazard rates are proportional for different people or types of people. Partial residual plots revealed violations of proportional hazards assumptions in age at first offense and age at identification. Because both of these covariates were found to be not related to time to felony offense, this was not explored in more detail (Landau, 2002), and these variables were removed from further analyses. In addition to proportional hazards, we also explored the assumption that cases have a proportionate effect on the hazard estimates. Plots of *df* betas revealed undue influence on the race variable by one case.

The Cox regression was repeated, this time removing the covariates of age at first offense and age at identification because of the violations of the proportional hazards assumptions and removing one case because of its undue influence on race. In the final model for felony offense, statistical findings were only slightly affected; the overall model was significant in predicting number of days until felony offense ($\chi^2[203, 4] = 36.79, p < .0001$); intervention group and gender still predicted time until offense and the other covariates were still not significant (see Table 3). Youth in the comparison group were three times more likely to commit a felony offense than youth in Connections ($exp[B] = 2.987, p < .0001$). Boys were 2.2 times more likely to

TABLE 3: Time Until Felony Offense, Final Cox Regression Model

	B	SE	*Wald*	df	p	*Exp(*B*)*
Group (comparison)	1.094	.217	25.471	1	< .001	2.987
Gender (male)	0.794	.251	9.973	1	.002	2.212
Race (non-White)	0.464	.304	2.332	1	.127	1.590
Number of offenses prior to identification	–0.050	.043	1.368	1	.242	0.951

NOTE: $\chi^2(203, 4) = 36.79$, $p < .0001$.

commit a felony offense than girls (*exp[B]* = 2.21, $p = .002$). Figure 2 depicts the survival curve. The median number of days until felony offense for youth in the comparison group was 242. Less than half of the youth in Connections had a subsequent felony offense. Because of this, for youth in Connections, the median number of days until felony offense is 790, which is the total number of days possible. Although this is not a perfectly accurate representation of the actual length until recidivism, it is clear that it took much longer on average for youth in Connections to have a felony offense.

Number of Days in Detention

Of youth in Connections, 72% served detention at some point in the 790-day postidentification window. This was significantly different than youth in the comparison group, all of whom served detention ($\chi^2 = 31.4$, $p < .0001$). Of those who did serve detention, the youth in Connections had an average of 4.4 detention episodes, significantly less than the average 7.5 episodes served by youth in the comparison group ($t = –5.4$, $p < .0001$). For the total 790-day window, the youth in Connections had an average of 59 days of detention served, also significantly less than the 102 days for youth in the comparison group ($t = –4.7$, $p < .0001$). Additionally, it did not appear that the justice system was more lenient with youth in the Connections group; there were no significant differences in the average number of days of detention served per episode.

Discussion

The study found that youth in Connections—an individualized, coordinated mental health service within a juvenile department—were less likely to recidivate than youth receiving mental health and juvenile justice services in a traditional manner. Youth in Connections took three times longer than youth in the comparison group to recidivate. Youth in Connections served

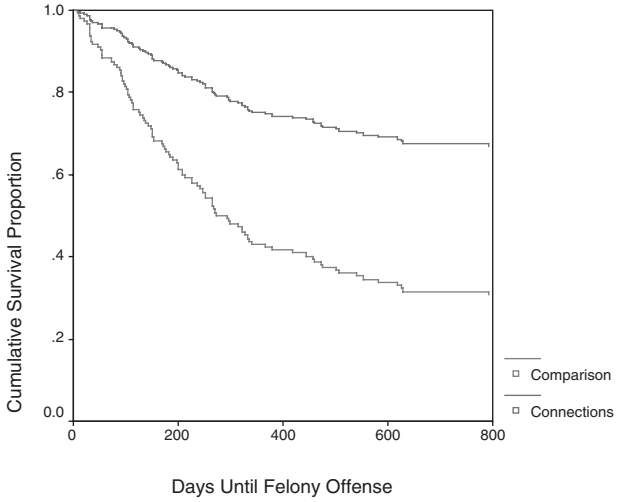

Figure 2: Predicted Time to Felony Offense for Connections and Comparison Groups

fewer episodes of detention and spent fewer total days in detention. Additionally, our past research found that after intake youth in Connections demonstrated significant improvements on standardized measures of behavioral and emotional problems, increases in behavioral and emotional strengths, and improved functioning at home, at school, and in the community (Pullmann, Kerbs, & Koroloff, 2004).

To date, only Wraparound Milwaukee and the Dawn Project (Anderson et al., 2003; Kamradt & Meyers, 1999) have found support for the effectiveness of wraparound in decreasing recidivism. Both of these studies lacked a comparison group, and only a small percentage of the Dawn Project's sample was from juvenile justice. Our study employed a comparison group, and the entire sample was drawn from juvenile justice. In another study of wraparound, Carney and Buttell (2003) demonstrated positive findings, but they did not uncover a relationship between wraparound and recidivism. However, these authors indicated that the wraparound teams they studied were mostly composed of family, neighbors, and other nonprofessional informal supports with no training or experience in wraparound. They argue that this is one possible reason why wraparound was not more successful. Our study may have had more positive results because Connections wraparound teams were composed of individuals trained and supervised in carrying out wraparound practice.

Our results reflect not only an improvement for the individual youth in Connections (perhaps to last their lifetime), but they also suggest a possible significant impact on society through a reduction of the extreme social and economic costs associated with crime. Policy makers should search for the best settings to target effective interventions that specifically affect the youth most likely to chronically offend. Juvenile justice may be one such setting. Studies have consistently found that an excellent predictor of chronic offending is an early age of first offense (Davis, Banks, Fisher, & Grudzinskas, 2004; Loeber & Farrington, 2000).

Granted, a project such as Connections is expensive and time-consuming to implement. The initial start-up costs for Connections were paid because of a serendipitous convergence of several factors, including the passage of a new sales tax with revenue slated to juvenile justice, the receipt of system of care grant funds, and years of building trusting relationships among community partners. Start-up costs included training, hiring new staff persons, and administrative overhead. In this type of program, intensive, ongoing supervision and monitoring of staff behavior is both essential and costly, especially during the early stages of the program. However, chronic offending is also expensive—one estimate placed the lifetime costs of a career criminal at $1.3 to $1.5 million (Cohen, 1998)—so the long-term benefits of a successful program may outweigh the costs. Hypothetically, if Connections saved just one youth from a lifetime of criminal behavior, the cost savings to society would roughly pay for Connections' expenses for all 164 youth served during the 1st year of the program.

On a more immediate and less hypothetical level, there were savings in this community as a result of using fewer detention days and less crime and its related costs. Additionally, this project was built on shared costs between the juvenile department and the public mental health authority. If not for Connections, many of these youth would have been served through both the public mental health system and juvenile justice. In Connections, they received comprehensive services administered through one agency, and our analysis revealed that this was more effective. However, we are unable to draw a definitive conclusion about whether the cost savings from reduced crime, detention, and administrative overhead offset the costs of increased supervision and service provision because a full cost-benefit analysis was beyond the scope of this study. Future research should explore the cost issue in more detail.

This study adds to a small body of research on potentially effective treatment programs for youth with serious mental health problems and juvenile delinquency. These programs are often complex—Connections, for instance, has many elements in addition to wraparound planning teams, such as family

support staff members, access to flexible funding, and being embedded in a community that strives to maintain a seamless system of care. The development of Connections was predicated on a systemic shift in the community's approach to treating youth with mental health problems. As with any complex, systemic, and community-based intervention, the evaluation of Connections could not definitively draw a conclusion about which of the many aspects of the program resulted in the outcomes. Indeed, the system of care and wraparound philosophy demand a comprehensive approach from system-wide administrative policy down to individual agency practice. This makes it much more difficult to isolate the independent variables than is true with the evaluation of less ecologically based programs (e.g., a parent-training program). Because of this and other reasons, it is becoming increasingly common in evaluations of complex interventions to employ a measure of fidelity to the program model.

Although this evaluation lacked a measure of wraparound fidelity, it is clear that Connections met certain requirements that have been associated with effective wraparound, including family involvement and flexible funding. Additionally, supervisors and wraparound consultants closely monitored Connections staff members. Staff persons were trained in wraparound principles and received regular consultation and supervision from juvenile department staff members and nationally recognized trainers, and there were record reviews by supervisory staff persons. Record reviews incorporated a locally developed fidelity checklist to ensure consistency of wraparound practice. This checklist was developed for training and supervisory feedback, and unfortunately, for this article, are inappropriate for use as rigorous fidelity measures. Regardless, there are solid indications that Connections used wraparound principles and practice in the context of a system of care.

Although controlling for all possible variables and demonstrating rigorous fidelity is beyond the scope of this study, our findings are still quite useful. By comparing our findings to previous research, this study begins to suggest beneficial elements of these complex programs. A growing body of research endorses two common elements of effective treatment programs: an ecological approach that emphasizes comprehensive and individualized service planning and intersystem collaboration (Borduin et al., 1995; Goldstrom et al., 2000; Murphy, 2002) and social support for youth and families (Colvin et al., 2002).

An ecological perspective is at the heart of MST, FFT, and wraparound; each approach juvenile delinquency by focusing on the multiple domains of a youth's life (education, peers, family, etc.). For youth with complex problems, this involves collaboration and coordination among agencies, service providers, and nonsystem stakeholders such as families and friends. These

three approaches also feature an element of social support for youth and families, which are receiving increasing attention as an important aspect of crime prevention (Colvin et al., 2002). Often, providing or identifying social support is more deliberate in wraparound-based programs. For instance, whereas FFT, MST, and wraparound programs all identify and build on family strengths and community supports, Connections actually employs a family support worker as a paid staff member.

Wraparound usually involves a wider array of stakeholders from the youth's various life domains. Team meetings are made up of various people including the youth, his or her family, friends, neighbors, parole officers, therapists, teachers, clergy, and others. This team works together to create a unified strength-based service plan. On the other hand, FFT and MST feature a therapist or trained interventionist who assesses the family and incorporates multidimensional, multisystemic, and child development variables into treatment. Because of the wider base of stakeholders in wraparound, it may help to build community awareness of and commitment to criminal prevention and abatement efforts. Other similarities and differences of these three approaches extend beyond the scope of this article. It is clear, however, that our research offers support to those that argue for the effectiveness of ecological approaches in treating juvenile delinquency.

The implications for policy makers and practitioners are numerous. First, if the youth-serving community has the political will and interagency trust required to implement a collaborative wraparound-based program, there are potential cost savings through improved youth functioning and cost sharing among agencies. This perspective is much larger than just juvenile justice and mental health—it encompasses child welfare, education, drug and alcohol services, community recreation, neighborhoods, religious centers, and any other institution that works with youth.

Barriers to collaboration are numerous. Policy makers need to address the severe limitations caused by categorical funding at federal, state, and local levels, which indirectly penalize communities for collaboration. Rather, funding agencies should encourage collaborative, flexible, and multidimensional treatment and services. Additionally, juvenile justice and mental health administrators need to openly address the barriers that arise from having different, and sometimes conflicting, philosophies and mandates.

Second, if a community is ready for true collaboration, policy makers and practitioners should consider interventions that address the multiple causes of youth crime and should focus on all of the important domains of a youth's life, including community functioning, education, family, and mental health. Evidence is mounting that individualized, comprehensive approaches are successful at preventing recidivism and improving functioning. Similarly,

the prevalence of mental, emotional, and behavioral problems in youth in juvenile justice cannot be ignored. Juvenile departments should institute systematic screening and identification of youth with these problems, and practitioners should incorporate this information into their daily work.

Third, juvenile justice programs should incorporate youth and family support and family participation throughout. Family life is one of the most important facets of a child's life and is essential to an ecological approach to treatment. However, families often feel excluded, shamed, or blamed by systems for their child's problems. It is undeniable that inappropriate caregiving has a negative impact on a child's behavior, but excluding or blaming caregivers is an ineffective treatment. Through skillful family support and authentic family involvement, caregivers can become part of a team collaborating to help the child rather than being completely left out or, worse, becoming an interfering or opposing force standing between service providers and a child's progress.

Limitations

Although our results are promising, some possible limitations must be mentioned. There were low numbers of youth that had left the program by the time of analysis. Future research should focus on youth outcomes after discharge from Connections. Two possible limitations spring from using a nonrandomly assigned comparison group. First, there is a history threat to internal validity; because data were collected at different points of time for the Connections and comparison group, there may have been historical events that differentially affected offense rates for the two groups. Undeniably, there were important changes in the county during this time; for instance, the system of care experienced further maturation and the county government expressed increased interest in criminal issues. However, if these historical events affected offense rates, we would expect a dramatic change in juvenile offenses independent of Connections, and this did not occur.

The second possible limitation related to using a nonrandomly assigned control group is a selection threat to internal validity—the groups are not completely equivalent. Youth in the comparison group were statistically similar to Connections youth on almost all of the variables that we had access to except for one. Youth in the comparison group had committed on average one offense less in their lifetime than youth in the Connections group prior to identification. Research has established that more past offenses are related to an increased likelihood to offend in the future (Niarhos & Routh, 1992). We would expect, therefore, in the absence of an intervention that youth in the comparison group would have been less likely to reoffend than those in the

Connections group. Our finding that the opposite occurred strengthens our conclusions.

Despite these potential limitations, this research provides support for the hypothesis that youth with mental health problems in juvenile justice who experience integrated and individualized wraparound planning within a system of care are less likely to recidivate at all, are less likely to recidivate with a felony offense, and will serve less detention time. Although it is becoming clear that it is critical to address the multiple determinants of delinquency in a comprehensive way, further research is needed to define the elements of ecological approaches to juvenile delinquency that are critical to achieving the desired outcomes.

REFERENCES

Anderson, J. A., Wright, E. R., Kooreman, H. E., Mohr, W. K., & Russell, L. A. (2003). The dawn project: A model for responding to the needs of children with emotional and behavioral challenges and their families. *Community Mental Health Journal*, *39*, 63-74.

Ashford, J. B., & LeCroy, C. W. (1990). Juvenile recidivism: A comparison of three prediction instruments. *Adolescence*, *25*, 441-450.

Bazemore, G., & Walgrave, L. (Eds.). (1999). *Restorative juvenile justice: Repairing the harm of youth crime*. Monsey, NY: Criminal Justice.

Boesky, L. M. (2002). *Juvenile offenders with mental health disorders: Who are they and what do we do with them?* Lanham, MD: American Correctional Association.

Borduin, C. M. (1994). Innovative models of treatment and service delivery in the juvenile justice system. *Journal of Clinical Child Psychology*, *23*(Suppl.), 19-25.

Borduin, C. M., Mann, B. J., Cone, L. T., Henggeler, S. W., Fucci, B. R., Blaske, D. M., et al. (1995). Multisystemic treatment of serious juvenile offenders: Long-term prevention of criminality and violence. *Journal of Counseling and Clinical Psychology*, 63, 569-578.

Breda, C. S. (1995). Delinquency and mental illness: The intersection of problems and systems. In C. J. Liberton, K. Kutash, & R. M. Friedman (Eds.), *The 9th annual research conference proceedings A system of care for children's mental health: Expanding the research base* (pp. 207-212). Tampa: University of South Florida, The Louis de la Parte Florida Mental Health Institute, Research and Training Center on Children's Mental Health.

Breda, C. S. (2001). The mental health orientation of juvenile courts. *Journal of Behavioral Health Services & Research*, *28*, 89-95.

Bruns, E. J., Walker, J. S., Adams, J., Miles, P., Osher, T., Rast, J., et al. (2004). *Ten principles of the wraparound process*. Portland, OR: Portland State University, National Wraparound Initiative, Research and Training Center on Family Support and Children's Mental Health.

Butts, J. A., & Mears, D. P. (2001). Reviving juvenile justice in a get-tough era. *Youth & Society*, *33*, 169-198.

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

Chaiken, M. R. (1998). *Kids, cops, and communities*. Washington, DC: National Institute of Justice.

Cocozza, J. J., & Skowyra, K. R. (2000). Youth with mental health disorders: Issues and emerging responses. *Juvenile Justice*, *7*, 3-13.

Cohen, M. A. (1998). The monetary value of saving a high-risk youth. *Journal of Quantitative Criminology*, *14*, 5-33.

Colvin, M., Cullen, F. T., & Vander Ven, T. (2002). Coercion, social support, and crime: An emerging theoretical consensus. *Criminology*, *40*, 19-42.

Connor, T., Phan, D. L., & Stephens, R. L. (2003). Survival analysis of arrest data in the longitudinal comparison study. In C. Newman, C. J. Liberton, K. Kutash, & R. M. Friedman (Eds.), *The 15th annual conference proceedings: A system of care of children's mental health: Expanding the research base* (pp. 5-7). Tampa: University of South Florida, The Louis de la Parte Florida Mental Health Institute, Research and Training Center on Children's Mental Health.

Cottle, C. C., Lee, R. J., & Heilbrun, K. (2001). The prediction of criminal recidivism in juveniles: A meta-analysis. *Criminal Justice & Behavior*, *28*, 367-394.

Davis, M., Banks, S., Fisher, W., & Grudzinskas, A. (2004). Longitudinal patterns of offending during the transition to adulthood in youth from the mental health system. *Journal of Behavioral Health Services & Research*, *31*, 351-366.

Fagan, J. (1991). Community-based treatment for mentally disordered juvenile offenders. *Journal of Clinical Child Psychology*, *20*, 42-50.

Friedman, R. M., Katz-Leavy, J. W., Mandersheid, R. W., & Sondheimer, D. L. (1996). Prevalence of serious emotional disturbance in children and adolescents. In R. W. Mandersheid & M. A. Sonnenschein (Eds.), *Mental health, United States, 1996* (pp. 71-89). Rockville, MA: Department of Health and Human Services.

Goldman, S. K. (1999). The conceptual framework for wraparound: Definition, values, essential elements, and requirements for practice. In B. J. Burns & S. K. Goldman (Eds.), *Promising practices in wraparound for children with serious emotional disturbance and their families* (Vol. 4, pp. 9-16). Washington, DC: American Institutes for Research, Center for Effective Collaboration and Practice.

Goldstrom, I., Jaiquan, F., Henderson, M. J., Male, A., & Mandersheid, R. W. (2000). The availability of mental health services to young people in juvenile justice facilities: A national survey. In R. W. Mandersheid & M. J. Henderson (Eds.), *Mental health, United States, 2000*. Washington, DC: Department of Health and Human Services, Substance Abuse and Mental Health Services Administration.

Henggeler, S. W., Melton, G. B., Brondino, M. J., Scherer, D. G., & Hanley, J. H. (1997). Multisystemic therapy with violent and chronic juvenile offenders and their families: The role of treatment fidelity in successful dissemination. *Journal of Consulting & Clinical Psychology*, *65*, 821-833.

Henggeler, S. W., Melton, G. B., Smith, L. A., Schoenwald, S. K., & Hanley, J. H. (1993). Family preservation using multisystemic treatment: Long-term follow-up to a clinical trial with serious juvenile offenders. *Journal of Child & Family Studies*, 3, 283-293.

Kamradt, B. (2000). Wraparound Milwaukee: Aiding youth with mental health needs. *Juvenile Justice*, *7*, 14-23.

Kamradt, B., & Meyers, M. J. (1999). Curbing violence in juvenile offenders with serious emotional and mental health needs: The effective utilization of wraparound approaches in an American urban setting. *International Journal of Adolescent Medicine and Health*, *11*, 381-399.

Landau, S. (2002). Using survival analysis in psychology. *Understanding Statistics*, *1*, 233-270.

Latimer, J. (2001). A meta-analytic examination of youth delinquency, family treatment, and recidivism. *Canadian Journal of Criminology*, *43*, 237-254.

Lattimore, P. K., MacDonald, J. M., Piquero, A. R., Linster, R. L., & Visher, C. A. (2004). Studying the characteristics of arrest frequency among paroled youthful offenders. *Journal of Research in Crime and Delinquency*, *41*, 37-57.

Lipsey, M. W. (1995). What do we learn from 400 research studies on the effectiveness of treatment with juvenile delinquents? In J. McGuire (Ed.), *What works: Reducing reoffending, guidelines from research and practice* (pp. 63-78). Chichester, UK: Wiley.

Lipsey, M. W., Wilson, D. B., & Cothern, L. (2000). *Effective intervention for serious juvenile offenders*. Washington, DC: Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention.

Loeber, R., & Farrington, D. P. (2000). Young children who commit crime: Epidemiology, developmental origins, risk factors, early interventions, and policy implications. *Development & Psychopathology*, *12*, 737-762.

Luke, D. A., & Homan, S. M. (1998). Time and change: Using survival analysis in clinical assessment and treatment evaluation. *Psychological Assessment*, *10*, 360-378.

Mears, D. P., & Kelly, W. R. (2002). Linking process and outcomes in evaluating a statewide drug treatment program for youthful offenders. *Crime & Delinquency*, *48*, 99-115.

Miles, P. (2000). *Individualized and tailored care: Facilitator skills training manual*. Portland, OR: Author.

Moon, M. M., Applegate, B. K., & Latessa, E. J. (1997). RECLAIM Ohio: A politically viable alternative to treating youthful felony offenders. *Crime & Delinquency*, *43*, 438-456.

Murphy, R. A. (2002). Mental health, juvenile justice, and law enforcement responses to youth psychopathology. In D. T. Marsh & M. A. Fristad (Eds.), *Handbook of serious emotional disturbance in children and adolescents* (pp. 351-374). New York: John Wiley.

Myner, J., Santman, J., Cappelletty, G. G., & Perlmutter, B. F. (1998). Variables related to recidivism among juvenile offenders. *International Journal of Offender Therapy and Comparative Criminology*, *42*, 65-80.

Niarhos, F. J., & Routh, D. K. (1992). The role of clinical assessment in the juvenile court: Predictors of juvenile dispositions and recidivism. *Journal of Clinical Child Psychology*, *21*, 151-159.

Pullmann, M. D., Kerbs, J., & Koroloff, N. (2004). *The Clark County system of care evaluation summative report: Connections*. Portland, OR: Portland State University, Regional Research Institute for Human Services.

Quist, R. M., & Matshazi, D. G. (2000). The child and adolescent functional assessment scale (CAFAS): A dynamic predictor of juvenile recidivism. *Adolescence*, *35*(137), 181-192.

Rogers, K. M., Zima, B., Powell, E., & Pumariega, A. J. (2001). Who is referred to mental health services in the juvenile justice system? *Journal of Child & Family Studies*, *10*, 485-494.

Rosenblatt, J. A., Rosenblatt, A., & Biggs, E. E. (2000). Criminal behavior and emotional disorder: Comparing youth served by the mental health and juvenile justice systems. *Journal of Behavioral Health Services Research*, *27*, 227-237.

Sexton, T. L., & Alexander, J. F. (2000). Functional family therapy. *Office of Juvenile Justice and Delinquency Prevention Juvenile Justice Bulletin*, 1-7.

Sharkey, J. D., Furlong, M. J., Jimerson, S. R., & O'Brien, K. M. (2003). Evaluating the utility of a risk assessment to predict recidivism among male and female adolescents. *Education and Treatment of Children*, *26*, 467-494.

Stroul, B. A., & Friedman, R. M. (1986). *A system of care for children and youth with severe emotional disturbances* (Rev. ed.). Washington, DC: Child and Adolescent Service System Program Technical Assistance Center.

Teplin, L. A., Abram, K. M., McClelland, G. M., Dulcan, M. K., & Mericle, A. A. (2002). Psychiatric disorders in youth in juvenile detention. *Archives of General Psychiatry*, *59*, 1133-1143.

Vander Stoep, A., Evens, C. C., & Taub, J. (1997). I. Risk of juvenile justice system referral among children in a public mental health system. *Journal of Behavioral Health Services & Research*, *24*, 428-442.

Washington State Institute for Public Policy. (2004). *Assessing risk for re-offense: Validating the Washington State Juvenile Court assessment*. Olympia: Washington State Institute for Public Policy.

Wasserman, G. A., Ko, S. J., & McReynolds, L. S. (2004). *Assessing the mental health status of youth in juvenile justice settings*. Washington, DC: Office of Juvenile Justice and Delinquency Prevention.

Weisz, J. R., Walter, B. R., Weiss, B., Fernandez, G. A., & Mikow, V. A. (1990). Arrests among emotionally disturbed violent and assaultive individuals following minimal versus lengthy intervention through North Carolina's Willie M program. *Journal of Consulting & Clinical Psychology*, *58*, 720-728.

Whitehead, J. T., & Lab, S. P. (1989). A meta-analysis of juvenile correction treatment. *Journal of Research in Crime and Delinquency*, *26*, 276-295.