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Antisocial Behavior and Depression Outcomes Among Comorbid Youth
in the Juvenile Justice System

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ABSTRACT

Antisocial Behavior and Depression Outcomes Among Comorbid Youth in the Juvenile Justice System

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Youth with comorbid depression and conduct disorder (CD) in the juvenile justice system are a particularly vulnerable population. Comorbidity of depression and CD, as well as juvenile justice involvement, is associated independently with impairment and negative outcomes. Nevertheless, service provision to this high-need population is especially lacking. The purpose of this study is to better understand the needs and strengths of youth with comorbid depression and CD in the juvenile justice system and to identify important targets for future intervention.

The study sample is comprised of 414 arrested and detained youth identified as having both significant depression and antisocial behavior through the Illinois Mental Health Juvenile Justice (MHJJ) initiative, a statewide program modeled after wraparound philosophy that links youth to community-based services and assesses outcomes. Youth's mental health needs and strengths at baseline, 3 months, and 6 months into MHJJ were assessed via the Child and Adolescent Needs and Strengths – Mental Health Scale (CANS-MH) completed by MHJJ clinical liaisons. Statistical methods included descriptive analyses, and univariate and multivariate binary logistic regression.

Results indicated a high level of mental health needs overall at baseline, consistent with the literature. In general, youth were unlikely to show improvement in depression without improvement in antisocial behavior, suggesting that CD outcomes may precede and perhaps facilitate depression outcomes. Overall, baseline risk behaviors and strengths had the greatest influence on outcomes, independent of other predictors. Youth with greater risk behaviors at baseline were less likely to show any improvement at 3 months, particularly in antisocial behavior. Comparatively, youth with identified strengths, overall and in specific areas (i.e., optimism, psychological wellbeing, interpersonal and vocational skills, and community ties), were more likely to show improvement in depression and/or antisocial behavior at both time periods. Additionally, substance abuse problems, poor family functioning, lack of supervision, school behavior problems, and caregiver health problems were each uniquely associated with negative outcomes. Findings highlight critical areas for assessment and intervention in the juvenile justice system. This study supports multifaceted, integrated, and strengths-based approaches to meeting the considerable needs of youth with comorbid depression and CD in the juvenile justice system.

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CHAPTER 1: INTRODUCTION

Comorbidity

The term “comorbidity” was coined over 30 years ago to refer to the co-occurrence of two distinct disorders in the same individual (A. R. Feinstein, 1970). Comorbidity has since received increasing research attention with a focus on the relationship between two or more disorders that co-occur more often than would be expected by chance (Angold, Costello, & Erkanli, 1999; Caron & Rutter, 1991). Kendall and Clarkin (1992) characterized the study of comorbidity as “the premier challenge facing mental health professionals in the 1990s,” citing the complexities that co-occurring conditions bring to the diagnostic classification and treatment of psychopathology (p. 833). Although there is continuing debate regarding the definition and nature of comorbidity, researchers recently have come to view the co-occurrence of mental disorders as less of a burden and more as an opportunity to better understand the development, course, and treatment of psychopathology (Angold, Costello, & Erkanli, 1999; Caron & Rutter, 1991; Lilienfeld, 2003; Rapp & Wodarski, 1997).

Comorbidity is evident across the developmental life span but is particularly prevalent among children and adolescents. Epidemiological studies consistently document high rates of comorbidity in child and adolescent populations (See Angold, Costello, & Erkanli, 1999 for a review). Adolescents appear to be at greater risk than adults for multiple disorders (Kessler et al., 1994). Even higher rates of comorbidity are apparent in clinical samples (McConaughy & Achenbach, 1994). Clinicians are faced frequently with children and adolescents who present with multiple problems that do not fit neatly into a single diagnostic category (Angold, Costello, & Erkanli, 1999; Clarkin & Kendall, 1992).

Comorbid Conduct Disorder and Depression

The comorbidity of conduct disorder (CD) and depression in children and adolescents has emerged over the past two decades as an area of particular research interest. CD and depression are among the problems seen most frequently in clinical settings for youth (Kazdin, Siegel, & Bass, 1990). Prevalence estimates of CD among children and adolescents range from less than 1% to slightly over 10% (e.g., Lahey, Miller, Gordon, & Riley, 1999), with rates higher in males (6-16%) than females (2-9%) (American Psychiatric Association, 1994). Comparable prevalence rates overall and by gender have been estimated for oppositional defiant disorder (ODD), which can be a precursor of CD (American Psychiatric Association, 1994; Lahey, Loeber, Burke, Rathouz, & McBurnett, 2002; Lahey, Miller, Gordon, & Riley, 1999).

The prevalence of major depressive disorder (MDD) is estimated to be approximately 2% in children and between 4% and 8% in adolescents with a male-female ratio of 1:1 during childhood and 1:2 during adolescence (Birmaher & Brent, 1998; Birmaher et al., 1996; Fleming & Offord, 1990; Kashani et al., 1987; Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993). Comparable prevalence rates have been estimated for dysthymic disorder, a less severe but typically more chronic depressive disorder than MDD (Birmaher et al., 1996; Garrison et al., 1997; Kashani et al., 1987).

Beyond the significant impairment associated with childhood depression and CD, both disorders have been linked to a host of negative outcomes during adolescence and into adulthood, such as academic underachievement (e.g., Hodges & Plow, 1990), peer relationship difficulties (e.g., Renouf, Kovacs, & Mukerji, 1997), substance abuse and dependence (e.g., Armstrong & Costello, 2002; Marmorstein & Iacono, 2003; Whitmore et al., 1997), suicide risk

(e.g., Apter et al., 1995; Cole, 1989; Haavisto et al., 2003; Shaffer et al., 1996; Shafii, Carrigan, Whittinghill, & Derrick, 1985), and antisocial behavior (e.g., G. R. Patterson, DeBaryshe, & Ramsey, 1989; Zoccolillo, Pickles, Quinton, & Rutter, 1992).

CD and depression co-occur at greater than chance levels in both clinical and population-based samples (e.g., Angold, Costello, & Erkanli, 1999; Caron & Rutter, 1991; Fleming & Offord, 1990; Lahey, Miller, Gordon, & Riley, 1999; Loeber & Keenan, 1994; Zoccolillo, 1992). Epidemiological studies indicate a wide range of prevalence estimates for the co-occurrence of CD and depression: between 22.7% and 83.3% of children and adolescents with depression also meet diagnostic criteria for CD/ODD, and between 8.5% and 45.9% of children and adolescents with CD/ODD also meet diagnostic criteria for depression (Angold, Costello, & Erkanli, 1999; Angold & Costello, 1993).¹

In a meta-analysis of general population studies of comorbidity in children in adolescents, Angold et al. (1999) found that depression co-occurs with CD/ODD almost as frequently as it does with anxiety disorders. This finding is remarkable given that the co-occurrence of depression and anxiety is arguably one of the most well-established diagnostic comorbidities, and measures of depression and anxiety among youth are highly correlated (Brady & Kendall, 1992; Seligman & Ollendick, 1998). On the other hand, the co-occurrence of CD/ODD and anxiety disorders is significantly less prevalent than is the co-occurrence of CD/ODD and depression. Moreover, the co-occurrence of CD/ODD and anxiety disorders seen in studies has been demonstrated to be an “epiphenomenon” of the independent relationships

¹ The studies reviewed by Angold et al. (1999) varied in terms of DSM edition utilized (i.e., DSM-III to DSM-IV), ages of participants (i.e., range of 9-20 years), and time frame of prevalence rates (i.e., current, 3-month, 6-month, 1-year). This variation may account for the wide range in prevalence estimates.

between depression and CD/ODD, and depression and anxiety (Angold, Costello, & Erkanli, 1999).

Comorbidity in general is associated with a more chronic course of illness, greater impairment across areas of functioning, and poorer prognosis than non-comorbid disorders (Newman, Moffitt, Caspi, & Silva, 1998; Verhulst & van der Ende, 1993). Along these lines, growing evidence suggests that children and adolescents with comorbid depression and CD may experience greater impairment and poorer outcomes in a range of areas than children and adolescents with either disorder alone (Beyers & Loeber, 2003; Capaldi, 1991, 1992; Capaldi & Stoolmiller, 1999; Knapp, McCrone, Fombonne, Beecham, & Wostear, 2002; Marmorstein & Iacono, 2001, 2003; Miller-Johnson, Lochman, Coie, Terry, & Hyman, 1998; Renouf, Kovacs, & Mukerji, 1997). The presence of co-occurring depression and CD, as compared to depression alone and/or CD alone, is associated with a higher risk of substance use problems (Armstrong & Costello, 2002; Fleming, Boyle, & Offord, 1993; Hughes et al., 1990; Marmorstein & Iacono, 2001, 2003; Miller-Johnson, Lochman, Coie, Terry, & Hyman, 1998), poor social competence (Marmorstein & Iacono, 2001; Renouf, Kovacs, & Mukerji, 1997), and academic problems (Capaldi, 1991; Marmorstein & Iacono, 2001, 2003). Perhaps most importantly, comorbid CD and depression is strongly associated with suicidality, especially when combined with alcohol use (e.g., Angold, Costello, & Erkanli, 1999; Brent, Kolko, Allan, & Brown, 1990; Brent, Kolko et al., 1993; Brent, Perper et al., 1993; Fombonne, Wostear, Cooper, Harrington, & Rutter, 2001; Marttunen, Aro, Henriksson, & Loennqvist, 1991; Rapp & Wodarski, 1997; Rohde, Lewinsohn, & Seeley, 1991; Shafii, Steltz-Lenarsky, Derrick, Beckner, & Whittinghill, 1988).

Not surprisingly given the association between comorbidity and poorer functioning and outcomes, individuals with comorbid mental disorders tend to use more mental health services,

rely more on sources of government welfare for financial support, and are more likely to have adult criminal conviction records than individuals with a single mental disorder (Newman, Moffitt, Caspi, & Silva, 1998). Specifically, individuals with histories of both depression and CD during childhood appear to incur significantly higher rates of inpatient care, criminal justice service use, and greater overall costs of care into adulthood than do individuals with childhood histories of depression without comorbid CD (Knapp, McCrone, Fombonne, Beecham, & Wostear, 2002).

Comorbid CD and Depression in the Juvenile Justice System

The high rate of criminal justice service use among individuals with childhood histories of comorbid depression and CD raises the issue of this particular comorbidity within the juvenile justice system. An estimated 2.2 million youth under the age of 18 are arrested each year (Snyder, 2005), and over 100,000 of these youth are placed in juvenile detention and correctional facilities on a given day (Sickmund, 2004). In the past decade, there has been growing recognition of the significant mental health needs of youth in the juvenile justice system (Atkins et al., 1999; Lyons, Baerger, Quigley, Erlich, & Griffin, 2001). Studies indicate that the prevalence of psychiatric disorders among juvenile-justice-involved youth is at least as high, if not higher, than that among youth served in community mental health settings (Atkins et al., 1999; R. Cohen, Parmelee, Irwin, Weisz, & et al., 1990) and, in some samples, comparable to that among youth in residential treatment and inpatient psychiatric hospital settings (R. Cohen, Parmelee, Irwin, Weisz, & et al., 1990; Davis, Bean, Schumacher, & Stringer, 1991; Lyons, Baerger, Quigley, Erlich, & Griffin, 2001).

A large-scale study of psychiatric disorders in detained youth found that nearly two-thirds of males and three-quarters of females met diagnostic criteria for at least one psychiatric disorder

(Teplin, Abram, McClelland, Dulcan, & Mericle, 2002). Moreover, greater than half of females and slightly less than half of males met criteria for two or more disorders in this sample (Abram, Teplin, McClelland, & Dulcan, 2003). Similarly high rates of psychiatric disorders, including comorbid disorders (especially among females), have been demonstrated in other studies of juvenile justice samples (Atkins et al., 1999; Dembo, Williams, la Voie, Getreu, & et al., 1990; Dixon, Howie, & Starling, 2004; Domalanta, Risser, Roberts, & Risser, 2003; Ulzen & Hamilton, 1998; Wasserman, McReynolds, Lucas, Fisher, & Santos, 2002).

Conduct disorder is the most prevalent psychiatric disorder among youth in the juvenile justice system (Atkins et al., 1999; Dixon, Howie, & Starling, 2004; Pliszka, Sherman, Barrow, & Irick, 2000; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002; Wasserman, McReynolds, Lucas, Fisher, & Santos, 2002). Teplin et al. (2002) found that 24.3% of males and 28.5 % of females met DSM-III-R criteria for a diagnosis of CD with impairment. This high rate of CD is not surprising given that involvement in juvenile detention results from delinquent behaviors, which characterize many of the symptoms of CD. Following CD and substance use disorders, the latter of which also may involve delinquent behavior, MDD and dysthymia were the next most prevalent mental disorders in this sample: 11.0% and 9.9%, respectively, among male detainees, and 18.9% and 12.5%, respectively, among female detainees (Teplin, Abram, McClelland, Dulcan, & Mericle, 2002). Other studies have documented high rates of depression and CD among youth in the juvenile justice system (Atkins et al., 1999; Dixon, Howie, & Starling, 2004; Domalanta, Risser, Roberts, & Risser, 2003; Duclos et al., 1998; Garland et al., 2001; Pliszka, Sherman, Barrow, & Irick, 2000; Randall, Henggeler, Pickrel, & Brondino, 1999; Ulzen & Hamilton, 1998; Wasserman, McReynolds, Lucas, Fisher, & Santos, 2002). Moreover,

Atkins et al. (1999) found that incarcerated youth had a higher prevalence of comorbidity than did youth served by community mental health centers.

The heightened rates of comorbidity, in general, and diagnoses of CD and depression in the juvenile justice population, coupled with the high incidence of co-occurrence between these disorders in the general population, would seem to suggest a high prevalence of comorbid CD and depression among juvenile-justice-involved youth. Indeed, Abram, Teplin, McClelland, and Dulcan (2003) found that of the 1,170 male juvenile detainees in their sample, 156 (13.3%) had a comorbid disruptive behavior disorder/ADHD and an affective disorder. Of the 656 female juvenile detainees, 114 (17.4%) had a comorbid ADHD/disruptive behavior disorder and an affective disorder. Although comorbidity was not examined for CD and MDD specifically, these disorders comprised the majority of ADHD/disruptive behavior disorders and affective disorders, respectively (Teplin, Abram, McClelland, Dulcan, & Mericle, 2002). Interestingly, anxiety disorders also were prevalent in this sample and highly comorbid with ADHD/disruptive behavior disorders. This appears surprising given that criminal behaviors associated with CD and juvenile justice involvement entail an element of risk-taking, which would seem to be less likely in anxious youth; however, perhaps the comorbidity of anxiety disorders and ADHD/disruptive behavior disorders in this sample reflects the “epiphenomenon” of the relationship between CD and depression, as addressed earlier. Other studies that have examined comorbidity in juvenile justice populations have documented similarly high rates of co-occurring externalizing and internalizing disorders, especially among female detainees (Dixon, Howie, & Starling, 2004; Goldstein et al., 2003; Randall, Henggeler, Pickrel, & Brondino, 1999; Ulzen & Hamilton, 1998).

As addressed earlier, comorbid depression and CD has been associated with a wide range of negative outcomes in the general population (Beyers & Loeber, 2003; Capaldi, 1991, 1992; Capaldi & Stoolmiller, 1999; Knapp, McCrone, Fombonne, Beecham, & Wostear, 2002; Marmorstein & Iacono, 2001, 2003; Miller-Johnson, Lochman, Coie, Terry, & Hyman, 1998; Renouf, Kovacs, & Mukerji, 1997). The literature indicates that juvenile justice involvement *per se* is associated with even graver outcomes, including heightened risk of HIV/AIDS (Teplin et al., 2005a) and early violent death, including suicide (Teplin, McClelland, Abram, & Mileusnic, 2005b). Based on the negative outcomes associated independently with comorbid CD and depression and juvenile justice involvement, comorbid youth in the juvenile justice system appear to be in “double jeopardy” (Grisso, 2004). Youth in the juvenile justice system with CD and/or depression would seem to be particularly vulnerable to these detrimental outcomes given the engagement in violent behavior toward others and oneself that are hallmark symptoms of CD and depression, respectively. Moreover, without appropriate treatment, these disorders and associated risk-behaviors are likely to persist and/or worsen over time (P. Cohen, Cohen, & Brook, 1993), contributing to further negative social outcomes and recidivism (H. N. Snyder & Sickmund, 2006). Not surprisingly, juvenile-justice-involved youth are at risk of having adult criminal records and placement in adult corrections (Lewis, Yeager, Lovely, Stein, & Cobham-Portorreal, 1994; Steadman, Cocozza, & Veysey, 1999). The public health implications of failing to address the mental health needs of youth in the juvenile justice, and particularly those with comorbid CD and depression, cannot be understated.

Despite the high level of mental health need in the juvenile justice system, the utilization of mental health services in this population is disproportionately low (Atkins et al., 1999; R. A. Feinstein et al., 1998; Goldstrom, Jaiquan, Henderson, Male, & Manderscheid, 2000; Pumariega

et al., 1999; Rawal, Romansky, Jenuwine, & Lyons, 2004; Rosenblatt, Rosenblatt, & Biggs, 2000; Teplin, Abram, McClelland, Washburn, & Pikus, 2005). Moreover, Pumariega et al. (1999) documented significantly lower rates of prior outpatient and acute mental health services utilization among incarcerated youth, as compared to both youth receiving community mental health services and youth in an inpatient psychiatric facility.

For some youth with significant mental health needs, especially those from racial/ethnic minority groups, the juvenile justice system appears to function as a first contact or gateway into the child service system and mental health treatment (Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003; Rawal, Romansky, Jenuwine, & Lyons, 2004). Along these lines, the high prevalence of unmet need among youth in the juvenile justice system raises questions about the failure of the public mental health system to adequately identify and serve many youth whose initial and subsequent juvenile justice involvement may have been prevented (Atkins et al., 1999; Foster, Qaseem, & Connor, 2004; Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003; Pumariega et al., 1999). Given the heightened rates of conduct disorder among detained youth, perhaps many youth are perceived as delinquent as opposed to emotionally disturbed, and thus, placed in detention rather than referred for mental health services (Rawal, Romansky, Jenuwine, & Lyons, 2004).

Another possibility is that the lack of or poor access to community-based and preventive mental health services, predominantly in rural and inner-city areas, leads many youth with emotional disorders to go unidentified and untreated. As a result of unmet need, some of these youth may then escalate to engaging in disruptive behaviors, placing them at risk of arrest and detention. In other cases, the juvenile justice system may serve as the last resort for youth who have not responded to or complied with community-based treatment interventions (Lyons,

Griffin, Quintenz, Jenuwine, & Shasha, 2003; Rawal, Romansky, Jenuwine, & Lyons, 2004; Scott, Snowden, & Libby, 2002). As addressed above, the persistence of conduct problems, regardless of comorbid emotional disturbances, may lead to juvenile justice involvement as opposed to placement in a higher level of mental health care, such as residential treatment.

For these reasons, the juvenile justice system has become a “de facto mental health system” (Goldstrom, Jaiquan, Henderson, Male, & Manderscheid, 2000; Grisso, 2004); however, mental health services in juvenile correctional facilities within several states consistently have been deemed inadequate (Butterfield, 1998; Coccozza & Skowyra, 2000; Florsheim, Behling, South, Fowles, & DeWitt, 2004). In a recent study, Teplin, Abram, McClelland, Washburn, & Pikus (2005) found that, among juvenile detainees with a major mental disorder (i.e., major depressive episode, manic episode, or psychosis) and associated functional impairments, only 15.4 % received treatment in the detention center and 8.1 % received treatment in the community by the time of case disposition or within 6 months of detainment. Thus, there is considerable unmet need in the juvenile justice system. Barriers to the provision of mental health services to this high-need population include funding issues, poor communication and collaboration across responsible service systems, overcrowding in correctional facilities, lack of training and staffing, inadequate mental health screening and assessment, and lack of available and appropriate mental health services (Coccozza & Skowyra, 2000; Goldstrom, Jaiquan, Henderson, Male, & Manderscheid, 2000).

These barriers to mental health services are further complicated by the high incidence of comorbidity in the juvenile justice system (Abram, Teplin, McClelland, & Dulcan, 2003). Service provision to youth with comorbid psychiatric disorders is fraught with particular challenges to assessment, treatment planning, compliance, and coordination of service delivery

(Clarkin & Kendall, 1992; Kendall & Clarkin, 1992; Newman, Moffitt, Caspi, & Silva, 1998).

In the case of comorbid depression and CD, the assessment and management of CD may override the identification and treatment of co-occurring depression (Kovacs, Paulauskas, Gatsonis, & Richards, 1988; Wu et al., 1999), especially in the juvenile justice system where delinquent behavior is of primary concern. Moreover, confinement in a correctional facility may be traumatizing and either exacerbate or contribute to the development of significant emotional and/or behavioral problems (Foster, Qaseem, & Connor, 2004). In fact, overcrowding in detention centers is associated with suicide, where rates are higher than in the community (Hayes, 2000), as well as physical assaults and accidental injuries (National Juvenile Detention Association, 2000). Thus, not only are juvenile-justice-involved youth with comorbid depression and CD at great risk, but service provision to these youth may be especially challenging.

An understanding of the comprehensive needs of comorbid youth in the juvenile justice system is crucial to the development of effective mental health interventions. In recent years, promising treatment strategies and models of service delivery have been implemented with juvenile justice populations at local, statewide, and federal levels (Borduin, 1994; Coccozza & Skowrya, 2000; Coccozza et al., 2005; Foster, Qaseem, & Connor, 2004; Grisso, 2004; Henggeler, 1999; Kamradt, 2001; Leve, Chamberlain, & Reid, 2005; Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003). One such intervention that has shown promising outcomes is the Illinois Mental Health Juvenile Justice (MHJJ) initiative. Modeled after wraparound treatment philosophy (Stroul, 1993; Stroul & Freidman, 1986), the MHJJ initiative is a statewide program designed and implemented to identify arrested and detained youth with an affective or psychotic disorder, link them to community-based services, and monitor their care (Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003). In an initial outcome evaluation of MHJJ, Lyons et al.

(2003) found that youth exhibited improved mental health functioning across several domains and reduced criminal recidivism; however, over half of youth maintained a significant level of depression at program completion. The majority of youth who enter MHJJ have an affective disorder, and, given their juvenile justice involvement, many have comorbid disruptive behavior disorders. As such, MHJJ is an ideal population to examine for a better understanding of how to address the comprehensive needs of this at-risk population.

The purpose of the present study is three-fold: (1) to assess the mental health needs and strengths of youth with comorbid depression and conduct problems who enter MHJJ, (2) to examine outcomes for depression and conduct problems over the course of their MHJJ participation, and (3) to identify factors that predict positive and/or negative outcomes for these youth. By addressing these questions, this study aims to better understand the needs of youth with comorbid depression and CD in the juvenile justice system and to identify important targets for intervention.

CHAPTER 2: METHOD

Program Overview

The MHJJ initiative was founded in 2000 by the Division of Mental Health of the Illinois Department of Human Services based upon the notion that identifying youth with mental illness and linking them with mental health services would prove clinically effective, potentially preventing future delinquency (Lyons, 2005; Stroul, 1993). The purpose of MHJJ is to facilitate the identification, screening, referral, and case monitoring of youth with major mental illness in juvenile detention. Additionally, MHJJ aims to strengthen the linkages between courts, probation offices, detention centers, schools, health and mental health care providers, and other community services (Brennen, Michelson, & Lyons, 2005; Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003). Initially piloted at seven detention centers across seven counties, MHJJ was expanded in 2001 to all counties in Illinois with detention centers (one county that had recently closed its detention center), totaling 18 detention centers throughout the state (Lyons, 2005; Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003). The Mental Health Services and Policy Program (MHSPP) of Northwestern University's Feinberg School of Medicine assisted with the evaluation design of MHJJ and manages the collection and analysis of outcomes.

Participants

Participants included 414 youth enrolled in the MHJJ Initiative identified as having a significant level of antisocial behavior and depression. The sample was comprised of 275 males (66.4%) and 139 females (33.6%), ranging in age from 10 to 18 years ($M = 15.23$, $SD = 1.48$). More than half of the youth were white (246, or 59.4%), just under one-third were African-American (123, or 29.7%), 28 (6.8%) were Hispanic, and 17 (4.1%) were multi-ethnic, of another ethnicity, or of unknown ethnicity.

The study sample was selected from an existing dataset of 3,042 youth referred to MHJJ by court personnel between June 2003 and June 2005. Of these youth, 2,057 (67.6%) had been screened using the Childhood Severity of Psychiatric Illness Scale (CSPI; Lyons, 1998), and 1,626 (79.0%) had been identified as eligible for MHJJ due to the presence of an affective disorder (i.e., 90.3% with CSPI *Emotional Disturbance* rating of ‘2’ or ‘3’), a psychotic disorder (i.e., 1.2% with CSPI *Neuropsychiatric Disturbance* rating of ‘2’ or ‘3’), or both (i.e., 8.1% with CSPI *Emotional Disturbance* and *Neuropsychiatric Disturbance* ratings of ‘2’ or ‘3’); 6 youth (0.3%) had missing data relevant to one of these CSPI items. Of eligible youth, 1,561 (96.0%) had been enrolled in MHJJ and assessed with the Child and Adolescent Needs and Strengths – Mental Health Scale (CANS-MH; Lyons, 2004).

Of the 1,561 youth for whom the CANS-MH was completed, 414 youth (26.5%) had ratings of ‘2’ or ‘3’ on both the *Depression/Anxiety* and *Antisocial Behavior* items and constituted the study sample of baseline comorbid youth². Given that the *Depression/Anxiety* item assesses anxiety in addition to depression, some of the youth in this sample may have had anxiety disorders; however, given that MHJJ specifically targets youth with an affective and/or psychotic disorder, it is unlikely that the sample included youth with anxiety but no depression, particularly given the high correlation between depression and anxiety disorders discussed above. The following youth were excluded: 106 (6.8%) with psychosis, regardless of the presence of depression; 75 (4.8%) with neither depression nor antisocial behavior; 924 (59.2%)

² History of DSM-IV diagnoses was provided with other background information; however, this information was not deemed appropriate for identifying the presence of depression and antisocial behavior in the study sample, since the psychiatric diagnoses listed came from a variety of sources (e.g., previous records, parent/caregiver report) and were not guaranteed to be a reliable assessment of the youth’s current mental health functioning.

with depression but no antisocial behavior; 32 (2.0%) with antisocial behavior but no depression, and 10 (0.6%) with missing or inaccurate data.

Of the 414 youth comprising the study sample, 350 (84.5%) received a CANS-MH assessment at 3 months following MHJJ enrollment, and 197 (47.6%) received a CANS-MH assessment at 6 months. There were no statistically significant differences in gender distribution between these youth and those for whom a CANS-MH was not completed at 3 months, $\chi^2(1, N = 414) = 2.19, p = .139$, or at 6 months, $\chi^2(1, N = 414) = 0.75, p = .388$. Likewise, there were no statistically significant differences in racial distribution between youth who did and did not receive a CANS-MH assessment at 3 months, $\chi^2(3, N = 414) = 6.81, p = .078$, or at 6 months, $\chi^2(3, N = 414) = 3.14, p = .371$. With regard to age, youth who were ($M = 15.19, SD = 1.49$) and were not ($M = 15.44, SD = 1.38$) assessed at 3 months did not differ significantly, $t(384) = -1.13, p = .259$. On the other hand, youth who were assessed at 6 months were slightly younger ($M = 15.07, SD = 1.51$) than those not assessed at 6 months ($M = 15.37, SD = 1.44$), $t(384) = -2.03, p = .043$; however, this age difference was deemed not to be clinically meaningful given the relatively small discrepancy.

Procedures

A youth is eligible for referral to MHJJ by court staff (e.g., judges, attorneys, probation officers, and detention center staff) if he or she is: (1) between the ages of 10 and 17, (2) has been involved with a juvenile detention center program some time within the past 6 months, (3) exhibits at least one symptom of an affective or psychotic disorder (on a simple yes-and-no instrument used by court staff), and (4) is not a ward of the state and therefore eligible for other state services. Youth with disruptive behavior disorders are excluded unless these disorders are

comorbid with a suspected psychotic or affective disorder (Brennen, Michelson, & Lyons, 2005; Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003).

Once a referral is made, an MHJJ liaison contacts the youth's parents/caregiver for permission to screen the youth and communicate with the court regarding MHJJ involvement. MHJJ liaisons are master's level clinicians with experience in community-based care for youth with serious emotional disturbance and their families. If permission is granted, the liaison then meets with the youth and assesses him or her for the presence of an affective or psychotic disorder using the CSPI (Lyons, 1998), which is based on DSM-IV criteria (American Psychiatric Association, 1994). Eligibility for MHJJ is determined by a rating of '2' or '3' on two CSPI items, *Neuropsychiatric Disturbance* and *Emotional Disturbance*, corresponding to psychosis and depression, respectively (Lyons, 1998, 2005).

If the youth is deemed eligible for MHJJ based on the CSPI, the liaison completes a more detailed assessment of the youth's needs and strengths using the Child and Adolescent Needs and Strengths – Mental Health Scale (Lyons, Weiner, & Lyons, 2004). The MHJJ liaison utilizes the CANS-MH at enrollment to develop a community-based action plan comprised of individualized services to address the youth's identified needs and strengths (Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003). Services designated in the action plan may include counseling/psychotherapy, psychiatric medication management, psychological assessment, pediatric visits, educational advocacy, or other community-based services (Brennen, Michelson, & Lyons, 2005). The liaison arranges funding and has access to a flexible fund as a supplement where services are not covered by private or public funding (Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003).

The liaison does not provide direct clinical services, nor is he or she an agent of the court involved in the legal issues of the court case. Rather, the liaison informs the court of the youth's major mental illness and the service plan devised to meet the youth's mental health needs in the community. If the court decides to release the youth to the community and the MHJJ program, the liaison then works with the family to establish linkages with community providers. The liaison continues to work with the youth and family, follows the youth's court process, and assists in the youth's reintegration into the community (Brennen, Michelson, & Lyons, 2005; Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003). In addition, the clinical liaison is responsible for completing the CANS-MH using a web-based data system at approximately 3 months and 6 months to assess outcomes. The liaison's involvement is intended to be for up to 6 months; however, the services to which the youth is linked are expected to continue thereafter (Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003).

Measures

Childhood Severity of Psychiatric Illness Scale (CSPI)

The CSPI is a 27-item Likert-type rating scale with 4 anchored levels per item ('0' = *no evidence of disturbance* through '3' = *an acute or severe degree of disturbance*) (Lyons, 1998). Results from a series of studies indicate that the CSPI can serve as an accurate measure of children's mental health needs, service utilization, and outcomes (Lyons, 1998; Lyons, Rawal, Yeh, Leon, & Tracy, 2002). The CSPI has been shown to have an inter-rater reliability of .72 (for the overall scale) between crisis assessment workers for children in state custody using prospective assessment and research assistants using retrospective chart review (Lyons, Rawal, Yeh, Leon, & Tracy, 2002). Although not a diagnostic tool, the CSPI is designed to be consistent with psychiatric diagnoses and is familiar to many of the Illinois service providers

(Leon, Uziel-Miller, Lyons, & Tracy, 1999; Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003). All liaisons were trained to a reliability of above .80 using the CSPI (Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003).

Child and Adolescent Needs and Strengths Mental Health Scale (CANS-MH)

The CANS-MH is a structured assessment tool derived from the methodological approach of the CSPI, but includes a broader conceptualization of needs as well as an assessment of strengths. Strengths, as assessed with the CANS-MH, refer to the unique abilities, assets, and resources of the individual youth and his or her family, community, and other supports (Lyons, Uziel-Miller, Reyes, & Sokol, 2000). Specific strengths assessed with the CANS-MH include: family, interpersonal, relationship permanence, education, vocational, well-being, optimism, spiritual/religious, talents/interests, and community inclusion. In addition to Strengths, the CANS-MH is comprised of five other “dimensions” of needs related to service planning and decision-making: Symptom Presentation, Risk Behaviors, Functioning, Care Intensity & Organization, and Family/Caregiver Needs & Strengths (Lyons, Weiner, & Lyons, 2004).

There are 45 items in total, each with 4 anchored levels comparable to the CSPI. Ratings range from ‘0’ (i.e., no evidence of disturbance/no need for action) through ‘3’ (i.e., an acute or severe degree of disturbance/need for either immediate or intensive action); however, within the Family/Caregiver Needs & Strengths and Strengths dimensions, a rating of ‘0’ signifies a positive or well-developed strength, whereas a rating of ‘3’ represents the absence of a known or identifiable strength.

The CANS is used in a variety of mental health, child welfare, residential treatment, and juvenile justice programs nationally to assess needs, guide treatment decision-making and service planning, and evaluate outcomes (Lyons, Weiner, & Lyons, 2004). The CANS has been

shown to demonstrate concurrent validity with the Child and Adolescent Functional Assessment Scale (CAFAS; Hodges & Wotring, 2000), one of the most widely used outcomes measures in the children's mental health system (Dilley, 2003; Lyons, 2004). Interrater reliability of the CANS ranges from .75 with case vignettes to .83 with case records to over .90 with prospective, "live" cases. In addition, audit reliability of the use of the CANS in practice has been above .80 in several statewide applications (Anderson, Lyons, Giles, Price, & Estle, 2003; Lyons, 2004; Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003). The CANS also has shown reliability at the individual item level. Particularly relevant to this study, Depression/Anxiety have yielded reliabilities of .75 between clinicians and researchers and .65 among researchers, and Antisocial Behavior yielded reliabilities of .67 between clinicians and researchers and .82 among researchers (Anderson, Lyons, Giles, Price, & Estle, 2003). Reliability of the CANS-MH specifically for MHJJ is monitored using an annual audit methodology with an average reliability of .80 (Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003).

Statistical Analyses

In the first part of the analyses, frequencies and descriptive statistics were computed to examine the demographic characteristics of the sample (i.e., gender, age, and race), as well as baseline mental health needs and strengths from the initial CANS-MH completed at MHJJ enrollment. Given that the CANS-MH dimensions comprise different numbers of items, dimension totals were converted to a common metric (0-100) (i.e., (actual dimension total x 100)/maximum possible dimension total) to enable comparison between dimensions.

In the second part of the analyses, depression and antisocial behavior outcomes were examined at approximately 3 months and 6 months into the MHJJ program. Specifically, youth were categorized based on *Depression/Anxiety* and *Antisocial Behavior* ratings on their second

(3-month) and third (6-month) CANS-MH assessments. Ratings of '2' or '3' on these CANS-MH items are considered a clinically significant level of depression or antisocial behavior. Youth were grouped into the following mutually exclusive categories at 3 and 6 months: (1) No improvement overall, (2) Improvement in both depression and antisocial behavior, (3) Improvement in antisocial behavior alone, and (4) Improvement in depression alone. Derived from Howard et al.'s (Howard, Kopta, Krause, & Orlinsky, 1986; Howard, Krause, & Orlinsky, 1969; Howard, Lueger, Maling, & Martinovich, 1993) application of a method of causal analysis of nonexperimental data (Blalock, 1964), a two-by-two table of outcomes was created (i.e., improvement or nonimprovement in antisocial behavior (rows) x improvement or nonimprovement in depression (columns)). Proportions of youth in each cell of the table or group were compared to examine possible pathways of change.

Demographic characteristics and baseline mental health needs and strengths from the initial CANS-MH assessment were examined as potential predictors (independent variables) of each of these four outcomes at 3 and 6 months using binary logistic regression. Eight separate binomial dependent variables (4 outcomes x 2 time periods) were predicted via logistic regression models.

With regard to demographic variables, gender was entered as a categorical variable (i.e., male versus female), and age was standardized and entered as z-scores. Given the small number of youth whose race was reported as other than non-Hispanic White, African-American, or Hispanic (e.g., Native American, multi-racial), race was categorized into four groups: (1) Non-Hispanic White, (2) African-American, (3) Hispanic, and (4) Other. Race was entered into the logistic regression model using effects coding (i.e., White versus overall, African-American versus overall, Hispanic versus overall) (J. Cohen & Cohen, 1983).

The 44 CANS-MH items and 6 dimension totals (standardized to z-scores) each were entered separately into the 8 binomial logistic regression models to examine zero-order effects. Step codes were created for each CANS-MH item in order to examine the impact of a one-unit increase in rating (i.e., 0 to 1, 1 to 2, 2 to 3), in addition to linear trends. Significant linear and step effects of CANS-MH items across all dimensions, and significant demographic variables, then were considered for entry via forward stepwise selection in a multivariate, binomial logistic regression model for each outcome (vs. all other outcomes) at 3 and 6 months. Significant linear effects of CANS-MH dimension totals also were considered, separately from significant items, using the same methodology.

CHAPTER 3: RESULTS

Baseline Mental Health Needs and Strengths

Mental health needs and strengths at baseline are described in Table 1. A comparison of dimension totals indicates that the areas of greatest impairment at baseline were Strengths, followed by Problem Presentation. The other dimensions were comparable to one another with regard to severity.

Depression and Antisocial Behavior Outcomes at 3 and 6 Months

Of the 414 youth in the sample, 350 (84.5%) received a CANS-MH assessment at 3 months following MHJJ enrollment. Of these 350 youth, the majority (179, or 51.1%) showed no improvement overall, whereas only 13.1% (46 youth) evidenced improvement in both depression and antisocial behavior. Less than one-third of youth (107, or 30.6%) exhibited improvement in antisocial behavior but retained a significant level of depression, and only 18 youth (5.1%) showed improvement in depression but continued to exhibit significant antisocial behavior. The numbers of youth in each outcome group were significantly different, $\chi^2(1, N = 350) = 25.24, p < .001$.

About one-half (197 youth, or 47.6%) of the total sample of 414 youth received a CANS-MH assessment at 6 months. Of these 197 youth, one-third (64, or 32.5%) showed no improvement overall, one-third (67, or 34%) evidenced improvement in both depression and antisocial behavior, and just under one third (54, or 27.4%) demonstrated improvement in antisocial behavior but retained a significant level of depression. Only 12 youth (6.1%) exhibited improved depression but continued to display significant antisocial behavior. The numbers of youth in each outcome group were significantly different, $\chi^2(1, N = 197) = 30.45, p < .001$.

Overall, youth were more than twice as likely at 3 months and one and a half times as likely at 6 months to show improvement in antisocial behavior than improvement in depression. Moreover, the odds of improvement in depression without concurrent improvement in antisocial behavior were only 0.10, whereas the odds of improvement in antisocial behavior without concurrent improvement in depression were 0.60.

The following sections discuss predictors of antisocial behavior and depression outcomes at 3 months and 6 months. Due to the relatively low number of youth with improvement in depression alone at 3 months ($n = 18$) and 6 months ($n = 12$), analyses examining predictors of this outcome, in particular, were deemed uninterpretable and thus are not addressed below.

Univariate Analysis of Zero-Order Predictors

Demographic Characteristics

As addressed above, gender, age, and race were examined as predictors of each outcome at 3 months and 6 months. The only significant effect found was for race as a predictor of no improvement in any condition at 3 months. Specifically, African-American youth were less likely than all other youth to show no improvement ($OR = 0.59, z = 2.23, p < .05$). This effect was not significant at 6 months.

Mental Health Needs and Strengths

Table 2 describes statistically significant zero-order linear effects of baseline CANS-MH items and dimension totals on each depression and antisocial behavior outcome (vs. all other outcomes) at 3 and 6 months. Significant predictors are discussed below.

Problem presentation. Greater overall problem presentation at baseline decreased the likelihood of improvement in any condition at 3 months. Three items from the Problem Presentation dimension demonstrated significant zero-order linear effects on outcome (in order

of greatest z -score): Substance Abuse, Situational Consistency, and Oppositional Behavior.

Greater substance abuse problems, persistence of psychiatric symptoms over time, and pervasiveness of symptoms across situations were associated with a decreased likelihood of any improvement, and a particularly low probability of improvement in antisocial behavior alone, at 3 months. Lastly, youth with more oppositional behavior at baseline were less likely to evidence improvement in both depression and antisocial behavior at 3 months.

Risk behaviors. Greater overall risk behaviors at baseline decreased the likelihood of improvement in any condition at 3 months. In particular, youth with greater risk behaviors overall were less likely to show improvement in antisocial behavior, with or without concurrent improvement in depression; thus, the effect of the Risk Behaviors dimension on antisocial behavior outcome at 3 months was independent of depression outcome. In addition, higher ratings on four Risk Behavior items were associated with a decreased likelihood of improvement in any condition at 3 months (in order of greatest z -score): Social Behavior (i.e., socially unacceptable behaviors that place the youth at risk), Crime/Delinquency, Danger to Self, and Danger to Others. Moreover, youth with greater levels of criminal activity and problematic social behavior were less likely to evidence improvement in antisocial behavior alone at 3 months.

Functioning. Worse overall functioning at baseline decreased the likelihood of any improvement at 3 months. Four items within the Functioning dimension yielded significant linear effects on outcome (in order of greatest z -score): Family Functioning, School Achievement, School Behavior, and School Attendance. Youth with poorer family functioning were less likely to demonstrate improvement in both depression and antisocial behavior at 3 months. Youth with poorer academic performance or school behavior problems were less likely

to show any improvement, and especially improvement in antisocial behavior alone, at 3 months (Academic Achievement) or 6 months (School Behavior). Lastly, poorer school attendance decreased the likelihood of any improvement at 3 months.

Care intensity and organization. Need for greater care intensity and organization overall decreased the likelihood of improvement in both depression and antisocial behavior at 3 months. More specifically, youth with less stability in service providers (i.e., Service Permanence) were less likely to show improvement in both conditions at 3 months.

Caregiver needs and strengths. Although the Caregiver Needs and Strengths dimension overall did not significantly predict outcome, one item within the dimension, Supervision, yielded a significant effect. Youth receiving less supervision and monitoring from their caregivers at baseline were less likely to show improvement in antisocial behavior alone at 6 months.

Strengths. Greater overall strengths (i.e., lower ratings) at baseline were associated with an increased likelihood of improvement in any condition, and, especially, of improvement in both depression and antisocial behavior at 3 and 6 months. Of note, the Strengths dimension was the only dimension overall to predict outcome at 6 months. The presence of strengths in the following five areas increased the likelihood of improvement in any condition (in order of greatest z -score at 3 or 6 months): Optimism (i.e., positive future orientation; 3 months), Interpersonal skills (both 3 and 6 months), Family (i.e., love, mutual respect, support, communication between family members; 3 months), Vocational skills (3 months), Educational (i.e., strengths of the school system in meeting the youth's needs; 3 months), and Relationship Permanence (i.e., stability of significant interpersonal relationships; 6 months).

Moreover, strengths in the following nine areas were associated specifically with improvement in both depression and antisocial behavior: Inclusion (i.e., involvement in and ties and/or supports from the community; 6 months), Interpersonal skills (both 3 and 6 months), Well-being (i.e., psychological strengths; both 3 and 6 months), Optimism (i.e., positive future orientation; both 3 and 6 months), Talents/Interests (6 months), Relationship Permanence (6 months), Family (both 3 and 6 months), Spiritual/Religious (i.e., involvement in spiritual or religious activities; 6 months), and Vocational skills (both 3 and 6 months).

On the other hand, youth with greater community ties (i.e., Inclusion) or a more positive future orientation (i.e., Optimism) were less likely to demonstrate improvement in antisocial behavior without concurrent improvement in depression at 6 months; this suggests that the effect of these strengths on improvement in antisocial behavior is dependent upon improvement in depression. To the contrary, better developed vocational skills increased the likelihood of improvement in antisocial behavior alone at 3 months, indicating that vocational strengths impact antisocial behavior outcome regardless of depression outcome.

In addition to the above linear effects, Tables 3 through 5 show the proportions of youth with each outcome at 3 and 6 month per baseline CANS-MH item rating. Of note, only items for which a one-point increase in rating resulted in a significantly increased or decreased proportion of youth with a particular outcome at 3 or 6 months are included in the table (with arrows indicating significant step effects).

Multivariate Analysis of Unique Predictors

Table 2 shows unique linear effects (*OR* and *z* statistics listed under “Unique” columns), and Tables 3 through 5 show unique step effects (depicted with subscripts), retained in binomial multivariate models constructed to predict each outcome (versus the other 3 possible outcomes)

after controlling for all other significant linear and step effects across dimensions, as well as significant demographic characteristics. All of the final multivariate models were statistically significant.

Improvement in Both Depression and Antisocial Behavior vs. All Other Outcomes

The final model predicting improvement in both depression and antisocial behavior (versus no improvement overall, improvement in depression only, and improvement in antisocial behavior only) at 3 months—comprised of Well-being, Caregiver Physical/Behavioral Health, Family Functioning, and Danger to Others as unique predictors—accurately classified 90.3% of youth ($\chi^2 = 31.02$, $df = 4$, $p < .001$). The final model predicting this same outcome at 6 months—which retained Inclusion and Optimism as unique predictors—accurately classified 67.2% of youth ($\chi^2 = 20.43$, $df = 2$, $p < .001$).

Improvement in Antisocial Behavior Only vs. All Other Outcomes

The models constructed to predict improvement in antisocial behavior alone (versus no improvement overall, improvement in depression only, and improvement in both) at 3 months—with Crime/Delinquency, Substance Abuse, and Vocational Strengths as unique predictors—and at 6 months—comprised of Inclusion, School Behavior, Optimism, and Supervision—accurately classified 73.7% of youth ($\chi^2 = 24.59$, $df = 3$, $p < .001$) and 76.9% of youth ($\chi^2 = 21.78$, $df = 4$, $p < .001$), respectively.

No Improvement Overall vs. All Other Outcomes

Finally, the models predicting no improvement overall (versus improvement in depression only, improvement in antisocial behavior only, and improvement in both) at 3 months—with Substance Abuse, Social Behavior, and Optimism as unique predictors—and at 6 months—with Interpersonal strengths as the only unique predictor—accurately classified 66.8%

of youth ($\chi^2 = 36.63$, $df = 3$, $p < .001$) and 68.1% of youth ($\chi^2 = 6.05$, $df = 1$, $p < .05$), respectively. Specific unique effects from these multivariate models are discussed below.

Demographic Characteristics

The effect of race on outcome (i.e., African-American youth more likely than all other youth to show improvement in any condition) was not retained in the final multivariate model after controlling for significant CANS-MH predictors.

Mental Health Needs and Strengths

Problem presentation. Overall problem presentation did not retain a unique effect on outcome after controlling for the effects of all other significant dimensions (i.e., Risk Behaviors, Functioning, and Strengths). The only predictor within the Problem Presentation dimension to demonstrate any unique effects, Substance Abuse, yielded both unique linear and step effects on outcome at 3 months after controlling for all other significant effects across dimensions. The contrast of '0', '1' versus '2', '3' for Substance Abuse was preferred to the linear effect of this item in the final multivariate model predicting improvement in any condition; youth with moderate to severe substance abuse problems at baseline were less likely to show any improvement than were youth with mild or no substance abuse problems. In addition, more severe substance abuse problems decreased the likelihood of improvement in antisocial behavior alone.

Risk behaviors. The Risk Behaviors dimension retained unique effects on outcome at 3 months; after controlling for all other significant dimensions, greater overall risk behaviors still decreased the likelihood of any improvement and particularly decreased the probability of improvement in both depression and antisocial behavior at 3 months.

Additionally, three specific risk behaviors yielded unique linear or step effects on outcome at 3 months after controlling for all other significant effects (in order of greatest z -score): Social Behavior, Crime/Delinquency, and Danger to Others. Greater social behavior problems at baseline decreased the likelihood of any improvement. More severe criminal behavior decreased the likelihood of improvement in antisocial behavior alone. Lastly, the contrast of '0', '1' versus '2', '3' for Danger to Others was preferred to the linear effect of this item in the final multivariate model predicting improvement in both depression and antisocial behavior at 3 months; youth evidencing moderate to severe aggression toward others at baseline were less likely than youth with no recent history of aggression to show improvement in both conditions.

Functioning. Overall level of functioning did not retain a unique effect on outcome after controlling for all other significant dimensions. Nevertheless, two items from the Functioning dimension demonstrated unique linear effects (in order of greatest z -score): Family Functioning and School Behavior. Specifically, youth with poorer family functioning were less likely to show improvement in both depression and antisocial behavior at 3 months. Also, youth with greater behavior problems at school were less likely to evidence improvement in antisocial behavior alone at 6 months.

Care intensity and organization. The only item to demonstrate a significant zero-order effect on outcome—Service Permanence—was not retained as a unique predictor after controlling for all other significant effects across dimensions.

Caregiver needs and strengths. Within the Caregiver Needs and Strengths dimension, Physical/Behavioral Health and Supervision demonstrated unique step or linear effects controlling for all other significant effects across dimensions. The contrast of '0', '1', '2' versus

'3' for Physical/Behavioral Health yielded a unique step effect; youth with caregivers who were physically unable to provide needed care were more likely show improvement in both depression and antisocial behavior at 3 months than were youth with caregivers who had some limitations in the provision of needed care due to significant physical/behavioral health problems; however, only 5 youth were rated '3,' suggesting that this finding should be interpreted with caution. Poorer supervision and monitoring by caregivers at baseline decreased the likelihood of improvement in antisocial behavior alone at 6 months.

Strengths. The Strengths dimension retained a unique effect on outcome at 3 months; after controlling for the effects of all other significant dimensions, the presence of fully developed strengths increased the likelihood of improvement in any condition. On the other hand, the effect of the Strengths dimension specifically on improvement in both depression and antisocial behavior conditions at 3 months was not retained in the final multivariate model.

Five specific areas of strengths yielded unique linear or step effects on outcome after controlling for all other significant effects (in order of greatest z -score at 3 or 6 months): Well-being, Optimism, Inclusion, Vocational skills, and Interpersonal skills. The contrast of '0' versus '1', '2', '3' for Well-being was preferred to the linear effect of this item; youth with exceptional psychological strengths were significantly more likely than youth with good, limited, or no known psychological strengths to show improvement in both depression and antisocial behavior at 3 months; however, only 12 youth in the entire sample were rated as having exceptional psychological strengths, suggesting that this finding should be interpreted with caution.

The linear effects of Optimism and Inclusion on improvement in antisocial behavior at 6 months remained dependent upon improvement in depression in the multivariate models; youth

with more optimistic future orientations or greater involvement in their communities were more likely to show improvement in both depression and antisocial behavior but less likely to show improvement in antisocial behavior alone at 6 months. In addition, greater optimism increased the likelihood of improvement in any condition at 3 months.

Finally, vocational and interpersonal strengths yielded unique linear effects controlling for all other significant effects. More fully developed vocational skills were associated with improvement in antisocial behavior alone at 3 months. Poorer interpersonal skills decreased the likelihood of improvement in any condition at 6 months.

CHAPTER 4: DISCUSSION

Baseline Mental Health Needs and Strengths

Youth in this sample had considerable mental health needs overall, in addition to their significant levels of both depression and antisocial behavior at baseline. Compared to the sample of MHJJ youth examined by Lyons et al. (2003), youth in the present sample were slightly more impaired on all CANS-MH dimensions at baseline. In particular, the relatively greater severity of problem presentation presumably was due in large part to the sample selection criteria for this study, given its focus on comorbid youth (i.e., high ratings on both depression and antisocial behavior). However, the higher ratings on all other CANS-MH dimensions are consistent with prior findings of greater impairment in a range of areas among youth with comorbidity (Newman, Moffitt, Caspi, & Silva, 1998; Verhulst & van der Ende, 1993), including comorbid CD and depression (e.g., Beyers & Loeber, 2003; Marmorstein & Iacono, 2001, 2003; Miller-Johnson, Lochman, Coie, Terry, & Hyman, 1998).

Compared to another sample of juvenile offenders from three different settings (i.e., detention-petition within the community, correctional, and residential treatment), the level of mental health needs among youth in the present study was greater than that of youth in community settings and comparable to that among youth in correctional or institutional settings (Lyons, Baerger, Quigley, Erlich, & Griffin, 2001). Along these lines, the present sample evidenced a similar level of impairment compared to youth in state custody in residential treatment (Lyons & Schaefer, 2000), and comparable symptoms but slightly lower risk behaviors compared to hospitalized youth (Leon et al., 2000; Leon, Snowden, Bryant, & Lyons, 2006; Lyons, Kisiel, Dulcan, Cohen, & Chesler, 1997).

Although the above studies utilized the CANS-MH (Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003) or CSPI (Leon et al., 2000; Leon, Snowden, Bryant, & Lyons, 2006; Lyons, Baerger, Quigley, Erlich, & Griffin, 2001; Lyons & Schaefer, 2000), comparisons with the present study are not based on statistical analysis of significant differences. Nevertheless, it is noteworthy that comorbid youth in the juvenile justice system may be at increased risk of correctional or institutional placements due to their high levels of mental health needs.

Depression and Antisocial Behavior Outcomes at 3 and 6 Months

Overall, depression was less likely to have improved than antisocial behavior at both 3 and 6 months after MHJJ enrollment. Perhaps, antisocial behavior was more responsive to intervention than was depression, at least initially. On the other hand, the empirical literature and anecdotal clinical experience generally suggest that CD tends to be more challenging to treat and to require a more multifaceted approach than depression (Birmaher & Brent, 1998; Kazdin, 2001). Nevertheless, although depression was identified in all youth at MHJJ enrollment, “externalizing” delinquent behavior and its overt consequences may have overshadowed seemingly less problematic “internalizing” mood problems in the planning and provision of services (Carlson & Cantwell, 1980; Kovacs, Paulauskas, Gatsonis, & Richards, 1988; Wu et al., 1999). Moreover, the presumably increased supervision and monitoring associated with arrest, detention, and MHJJ involvement likely decreased opportunities for youth to engage in subsequent antisocial behavior in the short-term. In contrast, the potentially traumatic circumstances associated with arrest, detention, and subsequent juvenile justice involvement, per se, may have exacerbated existing depression (Foster, Qaseem, & Connor, 2004; National Mental Health Association, 2004).

Since the present study did not examine specific interventions received through MHJJ, it is unclear what the primary target(s) of treatment were (i.e., CD versus depression). Moreover, the length or intensity of interventions also was not examined, precluding an investigation of a possible dose-effect response (Howard, Kopta, Krause, & Orlinsky, 1986; Salzer, Bickman, & Lambert, 1999). Along these lines, perhaps these different outcome groups represent groups of youth with unique diagnostic characteristics, based on the research of Howard et al. (1986) documenting different treatment response rates for depressed, anxious, and borderline-psychotic patients. Or, maybe the pattern of outcomes found in this study—antisocial behavior improving before depression for the majority of the sample—reflects a potential phase model of symptom change among comorbid youth.

Further examination of the pattern of outcomes in this study suggests the possibility of a more dynamic relationship between antisocial behavior and depression. Youth whose antisocial behavior improved were more than three times as likely as youth who retained a significant level of antisocial behavior to evidence improvement in depression at both 3 and 6 months. Moreover, the likelihood of improvement in antisocial behavior without concurrent improvement in depression was six-fold that of improvement in depression without concurrent improvement in antisocial behavior. In an application of the method of causal analyses discussed earlier (Blalock, 1964; Howard, Krause, & Orlinsky, 1969), Howard et al. (1993) documented a phase model of psychotherapy outcome for adults, in which subjective well-being tends to precede and facilitate symptomatic distress reduction, which in turn, tends to precede and facilitate improvement in life functioning. Likewise, data from the current study suggest that improvement in ASB may have preceded and facilitated improvement in depression for the majority of youth in this sample.

Few studies have been conducted that examine treatment outcomes for youth with comorbid depression and CD, and findings are mixed (Hughes et al., 1990; Kovacs, Paulauskas, Gatsonis, & Richards, 1988; Puig-Antich, 1982; Riggs, Mikulich, Coffman, & Crowley, 1997; Rohde, Clarke, Lewinsohn, Seeley, & Kaufman, 2001; Rohde, Clarke, Mace, Jorgensen, & Seeley, 2004). In a study of 31 children hospitalized for MDD, Hughes et al. (1990) found that children with comorbid depression and CD or ODD had a lower antidepressant drug response rate and a lower placebo response rate than did children with “pure” depression (with or without a comorbid anxiety disorder). In addition, CD/ODD was a risk factor for subsequent depressive episodes and more severe psychosocial adjustment problems (Hughes et al., 1990). Similarly, in a study of the effectiveness of cognitive-behavioral group treatment for 151 adolescents with depression, Rohde et al. (1991) found that, although overall lifetime comorbidity was unrelated to recovery, adolescents with comorbid CD, ODD, and ADHD were at increased risk of a relapse in depression at follow-up. The authors suggested that these comorbid conditions might have triggered the depression recurrence given their typically chronic course (Rohde, Clarke, Lewinsohn, Seeley, & Kaufman, 2001).

Although these studies provide some support for the influence of CD outcome on depression outcome, two earlier treatment outcome studies conducted with comorbid youth produced a different pattern of results. In a longitudinal study of 104 children clinically referred for depression, Kovacs et al. (1988) found that comorbid CD did not affect depression symptom presentation, treatment outcome, or course; however, CD at anytime was associated with an increased risk of long-term functional problems. In addition, the authors reported that, for most cases, comorbid CD appeared to develop as a complication of the depression and persisted after the depression remitted (Kovacs, Paulauskas, Gatsonis, & Richards, 1988). Likewise, in a study

of the effectiveness of an antidepressant for 43 boys with MDD, Puig-Antich (1982) discovered that all of the 13 boys with comorbid CD had a full antidepressant response, after which 11 no longer evidenced CD. In addition, the comorbid boys who continued to be followed only had a relapse in CD following a depression relapse. Based on these findings, Puig-Antich (1982) suggested that improvement in CD may be mediated by improvement in depression, contrary to the findings addressed above (Hughes et al., 1990; Rohde, Lewinsohn, & Seeley, 1991) and in the present study.

All of the above studies were conducted with children clinically referred for depression, some of whom also had CD. Similar to the present study, Rohde et al. (2004) focused specifically on comorbid depression and CD among juvenile-justice-involved youth. In a randomized, controlled trial of a group CBT treatment for depression, Rohde et al. (2004) found that acute reductions in depressive symptoms following CBT did not appear to impact the course of CD; however, the authors did not report on the potential effect of reduced CD symptoms on the course of depression, perhaps due to the low rates of CD recovery overall (13.2% in CBT and the control intervention combined).

Clearly, more outcome studies involving comorbid youth in the juvenile justice system are needed before any firm conclusions can be made about specific phases or pathways of improvement in CD and depression.

Unique Mental Health Predictors of Outcomes³

Overall, risk behaviors and strengths at baseline had the greatest influence on antisocial behavior and depression outcomes, independent of the effects of other predictors.

³ Only *unique* significant effects via binomial, multivariate analyses are discussed.

Risk Behaviors

Youth with greater risk behaviors at baseline were less likely to show any improvement, particularly in antisocial behavior. This effect was present at 3 months but not at 6 months, which may reflect the urgent or acute nature of risk behaviors. In fact, most of the assessed risk behaviors contain temporal criteria for assigning ratings (i.e., danger to self, danger to others, runaway, and crime/delinquency), with more recent as well as more severe behaviors yielding higher ratings. The robust effect of baseline risk behaviors on antisocial behavior outcome may be due to the fact that the most influential risk behaviors in the sample (i.e., social behavior, crime/delinquency, and danger to others) are antisocial in nature and reflect core symptoms of CD. Therefore, although all youth in the sample presented with a high level of antisocial behavior at baseline, those with greater risk behaviors may have had more severe antisocial behavior and, in turn, poorer outcomes at least in the short-term.

This finding highlights the importance of appropriately assessing and treating risk behaviors among juvenile offenders. In fact, in a recent research and program brief from the National Center for Mental Health and Juvenile Justice, Skowrya and Coccozza (2006) highlighted the need for a two-step mental health screening process for youth who enter the juvenile justice system, involving risk assessment in conjunction with general mental health screening to inform referral recommendations.

Strengths

In contrast to risk behaviors, strengths at baseline predicted outcome at both 3 months and 6 months. Strengths refer to the unique abilities, assets, and resources of individuals (Lyons, Uziel-Miller, Reyes, & Sokol, 2000) and, thus, may be more intrinsic or enduring by nature, unlike risk behaviors. As such, one would expect for strengths to have a relatively persistent

influence on outcomes. In this sample, youth with identified strengths, overall and in specific areas, were more likely to show any improvement at both time periods.

This finding of the positive influence of strengths on outcome is consistent with the literature on the role of strengths, resilience, and protective factors in mental health, coping with adversity, and overall functioning (e.g., Bruns, Burchard, & Yoe, 1995; Luthar, 1991; Lyons, Uziel-Miller, Reyes, & Sokol, 2000; Masten, 2001; Oman et al., 2004; Oswald, Cohen, Best, Jenson, & Lyons, 2001; Rutter, 1990; Vance, Bowen, Fernandez, & Thompson, 2002; Walrath, Mandell, Holden, & Santiago, 2004; Wolin & Wolin, 1993; Wyman, Cowen, Work, Raoof, & et al., 1992). Studies have documented specifically the association between protective factors or strengths and reduced violence or conduct behaviors (e.g., Aspy et al., 2004; Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995; Pearce, Jones, Schwab-Stone, & Ruchkin, 2003) and depressive symptoms (e.g., Denny, Clark, Fleming, & Wall, 2004; Ivanova & Israel, 2005; Shortt & Spence, 2006). Nevertheless, little attention has been paid to understanding the role of strengths or protective factors in comorbid depression and CD, particularly among youth in the juvenile justice system, for whom the focus tends to be particularly deficit-oriented. Results from the present study suggest that strengths are better predictors of mental health outcome than are psychiatric symptoms for this population, similar to the findings of Vance et al. (2002) in a non-juvenile justice sample of “high-risk” adolescents with both serious emotional disturbance (SED) and aggression.

Although all of the strengths examined were associated with improvement in depression and/or antisocial behavior, certain strengths were strongly and uniquely predictive of positive outcome. Regardless of baseline presentation, youth with optimistic future orientations,

exceptional psychological strengths (i.e., Well-being), strong interpersonal skills, significant ties to their communities, or vocational skills generally fared better.

Optimism. Optimism was associated with improvement in antisocial behavior only in the context of concurrent improvement in depression. This finding suggests an important association between optimism and depression among comorbid youth and a secondary effect on antisocial behavior. Indeed, future orientation has received a great deal of attention in the depression literature. Hopelessness (i.e., negative expectations about the future) has been identified as a negative cognitive style associated with the development and maintenance of depression in both adults and children (Abela, 2001; Abramson, Metalsky, & Alloy, 1989). To the contrary, hope and positive expectations about the future have been associated with stress resiliency and mental health in youth (Shorey & Snyder; Shorey, Snyder, Yang, & Lewin, 2003; C. R. Snyder, 2002; Wyman, Cowen, Work, & Kerley, 1993; Wyman, Cowen, Work, Raoof, & et al., 1992).

Based on this literature, several prevention and treatment programs for depression have focused on promoting more positive cognitive styles, such as optimistic thinking and hopefulness, among youth in the community (Gillham, Reivich, & Shatte, 2001; Reivich, Gillham, Chaplin, & Seligman, 2005; Stark & Boswell, 2000). The promotion of optimism may be especially challenging for youth in the juvenile justice system given the presumably negative circumstances leading up to, pending, and potentially following juvenile justice involvement; nevertheless, findings from this study suggest that the promotion of an optimistic future orientation may be especially worthwhile for youth with comorbid depression and CD. A focus on positive cognitive styles, in general, is further supported by the additional finding from this study that youth with exceptional psychological strengths, characterized by well-developed

coping and savoring skills, fared best in terms of improvement in both depression and antisocial behavior.

Interpersonal strengths. Interpersonal skills may be another valuable target of intervention for comorbid youth in the juvenile justice system. As addressed earlier, co-occurring depressive symptoms and conduct problems have been associated with poorer social competence (Marmorstein & Iacono, 2001; Renouf, Kovacs, & Mukerji, 1997). In the present study, youth with better interpersonal skills and positive relationships with others were more likely to show improvement in depression and/or antisocial behavior. This finding is consistent with existing research on high-risk youth, which highlights the protective effects of strong interpersonal skills, such as being likable (Garmezy, Masten, & Tellegen, 1984; Vance, Bowen, Fernandez, & Thompson, 2002; Wyman, Cowen, Work, Raoof, & et al., 1992), empathic (Luthar, 1991; Vance, Bowen, Fernandez, & Thompson, 2002; Werner & Smith, 1992), humorous (Lyons, Uziel-Miller, Reyes, & Sokol, 2000; Masten, 1986; Vance, Bowen, Fernandez, & Thompson, 2002) and having good social problem-solving abilities (Goodman, Gravitt, & Kaslow, 1995; Mott & Krane, 1994; Shure & Spivack, 1988; Vance, Bowen, Fernandez, & Thompson, 2002). Along these lines, research has documented the protective effects of social support networks among high-risk youth (Vance, Bowen, Fernandez, & Thompson, 2002; Werner & Smith, 1992), as well as the risk of negative peer affiliations on persistent delinquency (Huizinga, Loeber, & Thornberry, 1993; Scaramella, Conger, Spoth, & Simons, 2002).

Studies of interventions that aim to improve social skills and social problem-solving abilities among clinical samples have shown some promising results for youth with depression (Mott & Krane, 1994; Mufson, Weissman, Moreau, & Garfinkel, 1999; Rossello & Bernal,

1999) and youth with aggressive behavior or conduct problems (Sukhodolsky, Golub, Stone, & Orban, 2005; Webster-Stratton, Reid, & Hammond, 2001); however, these studies have not focused on youth with both depression and CD, who are in great need of intervention in this area. Findings from the present study support the application of social skills-related interventions, among other interventions, in the juvenile justice system, where youth are particularly susceptible to negative peer affiliations.

Inclusion. Like optimism, community inclusion was associated with improvement in both depression and antisocial behavior, with improvement in antisocial behavior dependent upon improvement in depression. Thus, the extent and quality of community involvement appears to be important for comorbid youth, perhaps through a primary influence on depression and a secondary influence on antisocial behavior. Research has documented the association between community involvement (e.g., time spent in groups, sports, or religious activities) or psychological sense of community (i.e., belonging, influence, fulfillment of needs, and social support) and health outcomes, including mental health and well-being (Davidson & Cotter, 1991; Kegler et al., 2005; McMillan & Chavis, 1986; Parker et al., 2001). Moreover, there has been a growing interest in "neighborhood-effects," which refer to the social-interactional and institutional mechanisms hypothesized to account for neighborhood-level variations in a range of outcomes, particularly among adolescents, including delinquency, violence, depression, and high-risk behavior (See Sampson, Morenoff, & Gannon-Rowley, 2002 for a review). Involvement in structured, community-based activities may serve a variety of positive functions, for instance, by assisting in developing or building upon the individual assets of youth (e.g., athleticism, artistic skills), improving mood through involvement in pleasurable activities, promoting positive peer affiliation and interpersonal qualities, and minimizing the amount of

unstructured time during which youth may engage in antisocial behaviors (Kegler et al., 2005; Leventhal & Brooks-Gunn, 2000; Sampson, Morenoff, & Gannon-Rowley, 2002). In addition, community-involved youth may benefit from informal social control, that is, monitoring and intervention when necessary, as well as positive role-modeling by non-parental residents who know neighborhood youth and their parents (Kegler et al., 2005; Leventhal & Brooks-Gunn, 2000; Sampson, Morenoff, & Gannon-Rowley, 2002).

Community involvement may be especially relevant for juvenile-justice-involved youth with comorbid depression and CD when they return to their communities following detainment. Not surprisingly, the treatment philosophies that have shown the most promise for youth with significant mental health needs, antisocial behavior, and/or juvenile justice involvement are those that emphasize community-based interventions, specifically multisystemic treatment (Armstrong & Costello; Henggeler et al., 1997), system of care philosophy (Stroul & Freidman, 1986), and wraparound process (VanDenBerg & Grealish, 1996), after which MHJJ is modeled.

Vocational strengths. Finally, vocational skills and work experience were associated with improvement in antisocial behavior at 3 months. This finding supports the notion that employment is critical to the success of at-risk youth (Office of Juvenile Justice and Delinquency Prevention, 2000; Werner & Smith, 1992). Not only are employed youth less likely to engage in criminal activities as a source of income, but employment minimizes the amount of unstructured time during which youth may engage in antisocial behaviors. Moreover, work experience enables youth to build upon existing vocational skills and to promote interpersonal qualities (e.g., leadership skills, team work) and individual strengths. Further, being in a structured work environment provides opportunities for positive peer affiliation and exposure to positive adult role-models.

Unfortunately, incarcerated youth are at a disadvantage with regard to finding and sustaining employment due to their criminal histories and, for the majority, academic underachievement. Further, youth with the most significant academic deficits are most likely to return to the juvenile justice system (Foley, 2001). Therefore, employment and vocational training is an important target for intervention with juvenile-justice-involved youth, which has been highlighted by the Office of Juvenile Justice and Delinquency Prevention (OJJDP, 2000). Various programs have been developed to prepare court-involved youth for the workforce, with some promising findings (Bullis & Yovanoff, 2006; Hamilton & McKinney, 1999; Office of Juvenile Justice and Delinquency Prevention, 2000).

Substance Abuse

Substance abuse was the only clinical symptom at baseline to have a unique effect on outcome. The literature indicates high rates of substance use disorders among youth with depression, CD, and, particularly, comorbid depression and CD, as addressed earlier (Armstrong & Costello, 2002; Fleming, Boyle, & Offord, 1993; Marmorstein & Iacono, 2001, 2003; Miller-Johnson, Lochman, Coie, Terry, & Hyman, 1998). The prevalence of substance use disorders is even higher among youth in juvenile detention, particularly among those with behavioral disorders and affective or anxiety disorders (Abram, Teplin, McClelland, & Dulcan, 2003; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002). Thus, the present sample is particularly vulnerable to substance use disorders.

Different explanations have been offered regarding the co-occurrence of substance use disorders and CD or depression. With regard to CD, it has been suggested that youth with CD may be more exposed to drugs and alcohol by virtue of their social environments, may have associated impulse-control problems resulting in experimentation with alcohol and drugs

(Kessler, 2004), or may use illegal substances as a means of engaging in norm-violating behavior (Marmorstein & Iacono, 2003). In terms of depression, youth may use drugs and alcohol as a means of self-medication (Kessler, 2004; Marmorstein & Iacono, 2003). Taken together, this literature suggests that youth with comorbid depression and CD may use substances in larger quantities or more frequently than youth with either disorder alone; and, such abuse may be due to a tendency toward behavioral disinhibition coupled with a desire to alleviate dysphoric mood, possibly related in part to the negative consequences arising from delinquent behavior (Kessler, 2004; Marmorstein & Iacono, 2003).

Findings from the current study indicate that the presence and severity of substance abuse problems negatively impact short-term depression and antisocial behavior outcomes for this subset of youth. A limited number of studies have addressed the possible effect of substance abuse or dependence on outcomes for depression and/or CD (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Crowley, Mikulich, MacDonald, Young, & Zerbe, 1998; Sanford et al., 1995). Nevertheless, evidence suggests that the presence or severity of substance use disorders or symptoms is associated with poorer outcomes (Crowley, Mikulich, MacDonald, Young, & Zerbe, 1998; Sanford et al., 1995) and that comorbid depression and CD may be associated with worse substance dependence symptoms (Marmorstein & Iacono, 2003). In addition, substance use disorders or symptoms have been shown to increase the risk and accelerate the timing of first-ever or future juvenile justice involvement among youth already in contact with mental health services (Scott, Snowden, & Libby, 2002).

Such findings stress the importance of substance abuse problems being adequately screened, continuously monitored, and appropriately addressed in juvenile detention (American Academy of Child and Adolescent Psychiatry, 2005), particularly for youth with comorbidity.

Treatment approaches shown to be effective for youth with both psychiatric and substance use disorders include family behavior therapy, individual cognitive problem-solving therapy (Azrin et al., 2001; Bender, Springer, & Kim, 2006), multisystemic treatment (Armstrong & Costello; Henggeler et al., 1997), and multidimensional family treatment (Liddle, Rowe, Dakof, Ungaro, & Henderson, 2004). MST, in particular, has been evaluated in substance abusing or dependent juvenile offenders. Results indicate significant reductions in treatment dropout rate (Henggeler, Pickrel, Brondino, & Crouch, 1996), soft drug use and substance-related arrests (Henggeler, Borduin, Melton, Mann, & et al., 1991), increased school attendance (Brown, Henggeler, Schoenwald, Brondino, & Pickrel, 1999), and significant long-term reductions in certain types of criminal behavior (i.e., aggressive) and illicit drug use (i.e., marijuana) (Henggeler, Clingempeel, Brondino, & Pickrel, 2002). Nevertheless, long-term treatment effects have not been observed for psychiatric symptoms (Henggeler, Clingempeel, Brondino, & Pickrel, 2002), perhaps underscoring the negative impact of substance abuse on depression and antisocial behavior outcomes seen in the present study.

Recent research has emphasized the need for integrated, as opposed to sequential or parallel, treatment for youth with both psychiatric and substance use disorders in the juvenile justice system. For example, the integrated co-occurring treatment model (Shepler, Cleminshaw, & Canary), based on system of care philosophy, emphasizes assessment and treatment integration, whereby both mental health and substance abuse services are provided by one provider and involve one integrated treatment program (Shepler, Cleminshaw, & Canary, 2006).

Family Functioning and Supervision

Youth with poorer family functioning were less likely to show improvement in both depression and antisocial behavior. Family dysfunction has been shown to be a risk factor for

both depression and CD or delinquency in community, clinical, and juvenile justice populations (e.g., Keiley, Lofthouse, Bates, Dodge, & Pettit, 2003; Kim et al., 2003; W. Mason et al., 2004; Meller & Borchardt, 1996; Pike, McGuire, Hetherington, Reiss, & Plomin, 1996; Simic & Fombonne, 2001; Steinhausen & Reitzle, 1996; Ulzen & Hamilton, 1998). Several indicators of poor family functioning are related to poorer treatment outcomes for youth with depression and/or CD, such as family and parent stress (Kazdin, 1995; Webster-Stratton & Hammond, 1990), low father involvement (Sanford et al., 1995), negative parent-child relationships (Sanford et al., 1995; Vance, Bowen, Fernandez, & Thompson, 2002), maternal distress (Goodyer, Germany, Gowrusankur, & Altham, 1991), maternal depression (Beauchaine, Webster-Stratton, & Reid, 2005; Brent et al., 1998), paternal substance abuse (Beauchaine, Webster-Stratton, & Reid, 2005), and global family functioning (Emslie et al., 1997).

In this study, caregivers' capacity to provide the level of monitoring and discipline needed by youth was associated with antisocial behavior outcomes. Specifically, youth who received more appropriate and consistent supervision and monitoring at baseline were more likely to show improvement in antisocial behavior. This finding is consistent with existing research documenting the influence of parental monitoring on levels childhood conduct problems, delinquency, and aggression (G.R. Patterson & Stouthamer-Loeber, 1984; Wasserman, Miller, Pinner, & Jaramillo, 1996). In fact, parental monitoring has been found to have a stronger protective effect on adolescent problem behaviors, including delinquency outcomes, compared to other parenting variables, such as discipline, reinforcement, communication, and involvement. Moreover, the protective effect of monitoring appears to be similar across gender, ethnicity, and location (Forehand, Miller, Dutra, & Chance, 1997; Griffin, Botvin, Scheier, Diaz, & Miller, 2000; G.R. Patterson & Stouthamer-Loeber, 1984).

Presumably, all of the youth in the present sample were lacking in caregiver supervision or monitoring to a certain extent given their juvenile justice involvement; however, findings from this study, supported by the above research, suggest that less monitoring and supervision of these youth at baseline predicted future antisocial behavior.

Based on the significance of family functioning and monitoring on outcomes for youth in this study, family-centered interventions (i.e., system of care, wraparound, MST) are particularly promising for this population. For instance, in system of care philosophy and wraparound approach, parents or caregivers are full participants in the development, implementation, and evaluation of treatment for youth (Burns & Hoagwood, 2002; Stroul & Freidman, 1986; VanDenBerg & Grealish, 1996). In MST and specific parent-training interventions, therapists work primarily with parents or caregivers to empower them to more effectively manage the youth's behavior (Dembo et al., 1998; Huey, Henggeler, Brondino, & Pickrel, 2000; W. A. Mason, Kosterman, Hawkins, Haggerty, & Spoth, 2003; Quinn & Van Dyke, 2004).

School Behavior

In addition to family functioning, school functioning was another important predictor of outcome. Specifically, youth with greater disruptive behavior problems at school were less likely to show improvement in antisocial behavior. This finding is logical given that various disruptive behaviors comprise symptoms of CD. As follows, the literature indicates a reciprocal relationship between school problems and CD or delinquency (Egger, Costello, & Angold, 2003; Fergusson & Woodward, 2000). Moreover, some evidence suggests that greater school problems increase the risk and accelerate the timing of juvenile justice involvement among youth already in contact with mental health services (Scott, Snowden, & Libby, 2002).

In addition, anecdotal evidence suggests that children and adolescents who exhibit significant behavior problems in one setting only (i.e., home but not school) have a better prognosis than those who display behavior problems in more than one setting (i.e., both home and school). As follows, youth with greater behavior problems at school, presuming that they also have difficulties at home, may be more likely to have persistent CD symptoms. Furthermore, compared to youth with CD or depression alone, those with comorbidity have been shown to be at greater risk of poor school adjustment (Capaldi, 1991; Marmorstein & Iacono, 2003), perhaps because they are more apathetic regarding the potential consequences of their negative behavior (Marmorstein & Iacono, 2003).

Results from this study coupled with existing research suggest that school behavior is an important target of intervention for juvenile-justice-involved youth. School-based programs tend to focus on prevention of delinquency among at-risk youth in preschool or elementary school (Eddy, Reid, Stoolmiller, & Fetrow, 2003; Reynolds, Temple, Robertson, & Mann, 2001). Less attention has been paid to the re-entry of formerly detained or incarcerated youth into the public school system.

Limitations

This study has several limitations. First, all of the data came from service providers as opposed to directed assessments of youth or their families; nevertheless, the CANS-MH is audited annually at each site to ensure the reliability with which it is completed (Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003). Second, determination of improvement or lack thereof was based on ratings on two specific items (i.e., *Depression/Anxiety* and *Antisocial Behavior*), as opposed to collective ratings across several items or measures corresponding to the presence of specific symptoms. Although not the focus of the present study, this limitation precluded an

examination of specific clusters of symptoms or disorder subtypes (e.g., overt versus covert conduct problems, MDD versus dysthymic disorder). In addition, degrees of improvement could not be examined because depression and antisocial behavior were treated dichotomously rather than continuously (i.e., improvement or no improvement). Also, with regard to depression, no measure of mania was used to rule-out bipolar disorder as opposed to unipolar depression. Moreover, given that the CANS-MH combines depression and anxiety into a single item (i.e., *Depression/Anxiety*), the outcomes examined for depression likely reflect anxiety outcomes in addition to, or possibly instead of, depression outcomes for some youth.

Third, no comparison or control group (e.g., youth with antisocial behavior but no depression) was available to assess whether the observed effects of the predictor variables on outcomes were specific to youth with comorbidity. Fourth, follow-up occurred at 3 months and 6 months during the duration of the intervention. As such, the longer-term, post-MHJJ influence of the predictor variables on depression and antisocial behavior outcomes is unknown. Fifth, the predictors examined concerned baseline functioning, and changes in these predictor variables through the course of MHJJ were not considered. Finally, this study does not address the types of services with which youth were linked through MHJJ, the “dose” (i.e., length or intensity) of specific treatment interventions, or the potential influences of service linkage on outcomes, all of which are important areas for future research.

Implications

Despite the above limitations, this study has important clinical and research implications. First, findings confirm the high level of mental health need among youth in the juvenile justice system and highlight the considerable needs of the subgroup of youth with comorbid depression

and CD. As such, this study supports ongoing efforts to develop effective interventions for youth involved in the juvenile justice system.

In addition, the finding that improvement in CD may precede and possibly facilitate improvement in depression is informative for treatment providers within the juvenile justice system. Providers can anticipate that CD symptoms likely will improve sooner than depressive symptoms among the majority of comorbid youth, and that few youth are likely to show a significant reduction in depressive symptoms prior to improvement in CD. Nevertheless, findings should not be interpreted to mean that CD, rather than depression, should be the primary target of treatment among youth with comorbidity. Nor should findings regarding the course and sequencing of outcomes be equated with the origins and development of these conditions (i.e., CD leads to the development of depression). These areas are ripe for future research that ultimately may change our conceptualizations of comorbid depression and CD. Additionally, future studies that utilize comparison or control groups can address whether the pattern of outcomes seen in the present study is specific to comorbid youth in the juvenile justice system, who presumably have more severe conduct problems than do comorbid youth in the community.

The identification of significant and unique predictors of depression and antisocial behavior outcomes highlights critical areas for assessment and intervention in the juvenile justice system. First, detained youth must be screened for acute risk behaviors upon initial entry into the juvenile justice system, as well as throughout the course of their involvement, in order to identify those youth requiring a high level of care, namely, psychiatric hospitalization. Second, mental health assessments must be thorough and pay particular attention to depression as well as substance abuse problems. Youth with substance use disorders, many of whom are likely to

have comorbid psychiatric disorders, should be linked with substance abuse treatment programs that are integrated into their overall treatment plan.

In light of the array of variables associated with positive or negative outcomes, interventions for youth in the juvenile justice system must be multifaceted and integrated. Findings from this study support a strengths-based approach that taps into the individual youth's strengths and those of his or her family, school, social environment, and community. Thus, in addition to mental health needs, youth should receive a dimensional assessment of strengths across multiple areas of functioning, using measures like the CANS-MH. For youth with comorbid depression and CD, strengths that appear to be particularly important include having a positive future orientation, solid coping skills, good interpersonal skills, vocational skills and work experience, and being involved in their communities. The identification of existing strengths and areas for potential growth should be integrated into the overall treatment plan and evaluated over time.

As addressed above, several existing intervention approaches embody characteristics found to be significant in this study for youth with comorbid depression and CD in the juvenile justice system. Programs modeled after the System of Care philosophy (Stroul & Freidman, 1986), MST (Henggeler et al., 1997), and wraparound process (VanDenBerg & Grealish, 1996) have demonstrated the most promise in addressing the needs of youth in juvenile justice (Borduin, Mann, Cone, Henggeler, & et al., 1995; Brown, Henggeler, Schoenwald, Brondino, & Pickrel, 1999; Henggeler, Borduin, Melton, Mann, & et al., 1991; Henggeler, Clingempeel, Brondino, & Pickrel, 2002; Kamradt & Meyers, 1999; Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003). Future research is needed to examine the effectiveness of these interventions, specifically among youth with comorbid depression and CD in the juvenile justice system.

Given the various components that comprise these interventions, “dismantling” studies are needed to identify critical components of treatment (e.g., traditional versus nontraditional interventions) and mechanisms of change. Such research should entail an examination of interactions between variables (e.g., strengths x risk behaviors), as well as an investigation of other potential predictors, such as additional comorbidities of CD and/or depression (e.g., anxiety disorders) and involvement with other systems of care (i.e., child welfare, mental health).

The ultimate goal of this body of research should be to develop a system of treatment planning and service delivery that matches specific interventions to the individualized needs of youth and their families. The present study serves as a first step toward understanding and addressing the needs of a particularly vulnerable population, that is, youth in the juvenile justice system with comorbid depression and CD.

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Table 1
*Mean Scores on the Child and Adolescent Needs and Strengths –
 Mental Health Scale (CANS-MH) at Baseline*

CANS-MH Item	<i>N</i> ^a	<i>M</i>	<i>SD</i>
PROBLEM PRESENTATION			
Psychosis (only ratings of 0 or 1)	414	0.23	0.42
Attention Deficit / Impulse Control	413	1.73	0.74
Depression / Anxiety (only ratings of 2 or 3)	414	2.10	0.31
Oppositional Behavior	414	2.02	0.61
Antisocial Behavior (only ratings of 2 or 3)	414	2.10	0.30
Substance Abuse	385	1.22	0.96
Adjustment to Trauma	393	1.14	0.92
Situational Consistency	414	1.79	0.78
Temporal Consistency	413	2.00	0.84
Total ^b	414	49.47	10.46
RISK BEHAVIORS			
Danger to Self	414	0.75	0.70
Danger to Others	414	1.38	0.77
Runaway	414	1.06	0.96
Sexually Abusive Behavior	402	0.22	0.65
Social Behavior	412	1.38	0.82
Crime / Delinquency	414	1.68	0.74
Total	414	35.92	13.57
FUNCTIONING			
Intellectual / Developmental	409	0.44	0.63
Physical / Medical	414	0.31	0.58
Family Functioning	414	1.79	0.79
School Achievement	330	1.80	0.93
School Behavior	322	1.73	0.89
School Attendance	323	1.44	1.01
Sexual Development	397	0.48	0.81
Total	330	32.89	11.92
CARE INTENSITY & ORGANIZATION			
Monitoring	410	0.93	0.89
Treatment	408	1.38	0.81
Transportation	410	1.03	0.78
Service Permanence	406	0.95	0.97
Total	410	35.65	19.67

Note. Dimension totals are converted to a common metric (0-100).

a. *N* refers to the number of youth with valid ratings for each item. b. Problem Presentation dimension does not include Situational Consistency and Temporal Consistency.

Table 1 (continued)
 Mean Scores on the Child and Adolescent Needs and Strengths –
 Mental Health Scale (CANS-MH) at Baseline

CANS-MH Item	<i>N</i>	<i>M</i>	<i>SD</i>
FAMILY/CAREGIVER NEEDS & STRENGTHS			
Physical / Behavioral Health	407	0.70	0.83
Supervision	411	1.18	0.77
Involvement with Care	412	1.07	0.73
Knowledge	410	1.18	0.73
Organization	406	0.92	0.77
Resources	412	1.53	0.81
Residential Stability	408	0.62	0.82
Safety	410	0.60	0.73
Total	410	32.37	18.16
STRENGTHS			
Family	413	1.47	0.79
Interpersonal	412	1.49	0.71
Relationship Permanence	410	1.40	0.74
Educational	410	1.65	0.91
Vocational	382	1.76	0.96
Well-being	412	1.70	0.60
Optimism	327	1.58	0.71
Spiritual / Religious	357	1.70	0.90
Talents / Interests	400	1.62	0.83
Inclusion	407	1.81	0.81
Total	402	55.80	16.72

Note. Dimension totals are converted to a common metric (0-100).

a. *N* refers to the number of youth with valid ratings for each item. b. Problem Presentation dimension does not include Situational Consistency and Temporal Consistency.

Table 2

CANS-MH Linear Predictors of Each Antisocial Behavior and Depression Outcome vs. All Other Outcomes at 3 Months and 6 Months

CANS-MH Item	Time	Improvement in Both															
		No Improvement Overall				Depression and Antisocial Behavior				Improvement in Antisocial Behavior Only				Improvement in Depression Only			
		Zero-Order		Unique		Zero-Order		Unique		Zero-Order		Unique		Zero-Order		Unique	
		OR	z	OR	z	OR	z	OR	z	OR	z	OR	z	OR	z		
PROBLEM PRES.																	
Substance Abuse	3 mos.	1.45**	3.13			0.98	0.15			0.71**	2.58	0.65**	2.70	0.64	1.55		
	6 mos.	1.18	0.94			0.82	1.16			1.12	0.64			0.79	0.69		
Temporal Consistency	3 mos.	1.30*	1.99			1.07	0.35			0.64**	3.15			1.69	1.60		
	6 mos.	1.01	0.06			0.80	1.22			1.00	0.02			2.74*	2.18 2.69* 2.07		
Situational Consistency	3 mos.	1.32*	1.97			1.07	0.32			0.66**	2.71			1.27	0.74		
	6 mos.	1.16	0.73			0.83	0.94			0.90	0.48			1.77	1.32		
Oppositional Behavior	3 mos.	1.25	1.24			0.56*	2.23			0.96	0.24			1.60	1.13		
	6 mos.	1.46	1.34			0.81	0.79			0.83	0.67			1.11	0.19		
Total ^a	3 mos.	1.36**	2.73			0.83	1.10			0.83	1.57			0.71	1.27		
	6 mos.	1.28	1.54			0.81	1.33			1.03	0.19			0.78	0.74		
RISK BEHAVIORS																	
Social Behavior	3 mos.	1.65***	3.59	1.75**	3.14	0.72	1.68			0.70*	2.42			0.84	0.57		
	6 mos.	1.07	0.37			0.86	0.81			1.03	0.16			1.25	0.58		
Crime/Delinquency	3 mos.	1.55**	2.95			0.83	0.86			0.65**	2.61	0.54**	2.90	1.03	0.08		
	6 mos.	0.92	0.39			1.18	0.78			0.93	0.31			0.91	0.22		
Danger to Others	3 mos.	1.41*	2.43			0.50**	3.23			0.96	0.28			1.03	0.09		
	6 mos.	1.49	1.85			0.77	1.26			0.79	1.06			1.43	0.84		
Sexually Abusive Behavior	3 mos.	1.54*	2.32			0.37	1.71			0.79	1.14			0.99	0.03		
	6 mos.	0.83	0.67			0.96	0.16			0.89	0.38			2.02*	2.13		
Danger to Self	3 mos.	1.43*	2.31			0.72	1.41			0.84	1.01			0.70	0.96		
	6 mos.	1.43	1.64			0.69	1.64			0.86	0.65			1.65	1.23		
Total	3 mos.	1.78***	4.74	1.88***	4.17	0.60**	2.86	0.59**	2.86	0.71**	2.78	0.71**	2.78	0.81	0.84		
	6 mos.	1.19	0.99			0.89	0.70			0.88	0.70			1.28	0.75		

Note. Table lists only CANS-MH items with a significant linear effect(s) at 3 months and/or 6 months; dimension totals include all items regardless of significant effects. "Zero-Order" refers to univariate effects of each item/dimension. "Unique" refers to unique effects of each item in binomial, multivariate analysis controlling for all other significant linear and step effects and significant demographic effects. Unique effects of dimension totals were retained from separate multivariate analysis controlling for all other significant effects of dimension totals, as well as significant demographic effects.

a. Problem Presentation dimension does not include Situational Consistency and Temporal Consistency.

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

Table 2 (continued)

CANS-MH Linear Predictors of Each Antisocial Behavior and Depression Outcome vs. All Other Outcomes at 3 Months and 6 Months

CANS-MH Item	Time	Improvement in Both													
		No Improvement Overall				Depression and Antisocial Behavior				Improvement in Antisocial Behavior Only				Improvement in Depression Only	
		Zero-Order		Unique		Zero-Order		Unique		Zero-Order		Unique		Zero-Order	Unique
		OR	z	OR	z	OR	z	OR	z	OR	z	OR	z	OR	z
FUNCTIONING															
School Achievement	3 mos.	1.43**	2.76			0.89	0.60			0.71*	2.50			0.95	0.18
	6 mos.	1.35	1.49			0.75	1.47			0.88	0.63			1.58	1.15
School Attendance	3 mos.	1.27*	1.98			0.88	0.70			0.82	1.48			0.91	0.37
	6 mos.	1.19	0.87			0.98	0.09			0.78	1.16			1.28	0.64
Family Functioning	3 mos.	1.24	1.57			0.54**	3.07	0.46**	2.70	1.08	0.50			1.06	0.19
	6 mos.	1.09	0.44			0.75	1.53			1.18	0.82			1.28	0.63
School Behavior	3 mos.	1.20	1.35			0.86	0.72			0.80	1.51			1.35	1.04
	6 mos.	1.62*	2.15			0.82	0.94			0.63*	2.09	0.55*	2.37	2.00	1.52
Total	3 mos.	1.29*	2.09			0.87	0.77			0.80	1.76			1.01	0.00
	6 mos.	1.26	1.24			0.85	0.87			0.80	1.13			1.66	1.41
CARE INTENSITY															
Service Permanence	3 mos.	1.16	1.33			0.64*	2.31			1.05	0.37			0.95	0.20
	6 mos.	1.02	0.14			0.97	0.17			1.00	0.02			1.00	0.01
Total	3 mos.	1.23	1.88			0.70*	2.00			0.92	0.69			1.05	0.21
	6 mos.	1.19	1.02			0.93	0.46			0.86	0.81			1.16	0.44
CAREGIVER NEEDS															
Involvement with Care	3 mos.	0.84	1.15			0.90	0.47			1.28	1.53			1.05	0.13
	6 mos.	1.12	0.54			0.73	1.44			0.98	0.11			2.26*	1.98
Supervision	3 mos.	1.06	0.42			0.72	1.46			1.04	0.25			1.26	0.73
	6 mos.	1.15	0.68			1.08	0.38			0.62*	2.05	0.53*	2.14	2.10	1.76
Total	3 mos.	0.94	0.59			0.85	0.94			1.13	1.03			1.16	0.63
	6 mos.	1.15	0.78			0.85	0.95			0.93	0.42			1.45	1.14

Note. Table lists only CANS-MH items with a significant linear effect(s) at 3 months and/or 6 months; dimension totals include all items regardless of significant effects. "Zero-Order" refers to univariate effects of each item/dimension. "Unique" refers to unique effects of each item in multivariate analysis controlling for all other significant linear and step effects and significant demographic effects. Unique effects of dimension totals were retained from separate multivariate analysis controlling for all other significant effects of dimension totals, as well as significant demographic effects.

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

Table 2 (continued)

CANS-MH Linear Predictors of Each Antisocial Behavior and Depression Outcome vs. All Other Outcomes at 3 Months and 6 Months

CANS-MH Item	Time	Improvement in Both													
		No Improvement Overall				Depression and Antisocial Behavior				Improvement in Antisocial Behavior Only				Improvement in Depression Only	
		Zero-Order		Unique		Zero-Order		Unique		Zero-Order		Unique		Zero-Order	Unique
		OR	z	OR	z	OR	z	OR	z	OR	z	OR	z	OR	z
STRENGTHS															
Optimism	3 mos.	1.94***	3.65	1.94**	3.08	0.48**	2.65			0.71	1.83			0.79	0.67
	6 mos.	1.28	0.87			0.42**	2.97	0.46*	2.18	1.89*	2.12	2.40*	2.28	1.20	0.33
Interpersonal	3 mos.	1.60**	2.94			0.55*	2.50			0.73	1.89			1.47	1.10
	6 mos.	2.12**	3.02	1.98*	2.38	0.39***	3.76			1.04	0.16			1.89	1.34
Family	3 mos.	1.47**	2.72			0.61*	2.40			0.82	1.31			1.08	0.24
	6 mos.	1.41	1.63			0.58*	2.50			1.24	0.99			0.99	0.03
Vocational	3 mos.	1.36**	2.66			0.71*	2.00			0.77*	2.09	0.67**	2.58	1.53	1.42
	6 mos.	1.25	1.31			0.68*	2.33			1.06	0.32			1.71	1.51
Educational	3 mos.	1.32*	2.32			0.83	1.04			0.83	1.41			0.82	0.72
	6 mos.	1.31	1.52			0.71	1.94			0.96	0.23			1.57	1.30
Well-being	3 mos.	1.47	1.94			0.52*	2.46			0.88	0.60			1.35	0.64
	6 mos.	1.42	1.19			0.36***	3.47			1.73	1.67			3.44	1.70
Talents/Interests	3 mos.	1.22	1.48			0.70	1.83			0.84	1.18			1.80	1.90
	6 mos.	1.37	1.54			0.54**	2.87			1.38	1.47			1.02	0.06
Inclusion	3 mos.	1.11	0.77			0.74	1.55			1.13	0.79			0.75	0.97
	6 mos.	1.25	1.11			0.39***	4.34	0.42**	3.01	1.87**	2.81	2.08*	2.44	1.88	1.51
Relationship Permanence	3 mos.	1.08	0.55			0.84	0.83			1.12	0.71			0.62	1.43
	6 mos.	1.63*	2.16			0.53**	2.79			1.21	0.82			0.93	0.18
Spiritual/Religious	3 mos.	1.05	0.42			0.81	1.13			1.04	0.29			1.04	0.13
	6 mos.	1.02	0.10			0.63*	2.39			1.49	1.95			1.50	0.97
Total	3 mos.	1.41**	2.93	1.35*	2.04	0.66**	2.59			0.84	1.40			1.06	0.21
	6 mos.	1.48*	2.18	1.48*	2.18	0.43***	4.43	0.43***	4.43	1.41	1.87			1.74	1.53

Note. Table lists only CANS-MH items with a significant linear effect(s) at 3 months and/or 6 months; dimension totals include all items regardless of significant effects. "Zero-Order" refers to univariate effects of each item/dimension. "Unique" refers to unique effects of each item in multivariate analysis controlling for all other significant linear and step effects and significant demographic effects. Unique effects of dimension totals were retained from separate multivariate analysis controlling for all other significant effects of dimension totals, as well as significant demographic effects.

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

Table 3
Proportions of Youth With No Improvement Overall at 3 Months and 6 Months Per CANS-MH Item Rating at Baseline

CANS-MH Item		Item Rating at Baseline			
		0	1	2	3
PROBLEM PRESENTATION					
Attention Deficit/Impulse Control	3 months	56.5%	56.8%	44.9%	< 65.0%
	6 months	15.4%	30.2%	32.1%	47.6%
Antisocial Behavior	3 months			48.9%	< 71.9%
	6 months			30.8%	58.3%
Substance Abuse	3 months	42.7%	43.6%	< ^a 62.3%	64.5%
	6 months	26.3%	32.8%	42.3%	18.2%
RISK BEHAVIORS					
Danger to Self	3 months	45.5%	50.3%	< 70.2%	33.3%
	6 months	28.6%	30.4%	< 51.9%	0.0%
Danger to Others	3 months	48.9%	44.6%	54.0%	< 84.2%
	6 months	24.0%	28.7%	37.5%	60.0%
Social Behavior	3 months	32.7%	48.6%	54.5%	< 79.2%
	6 months	30.0%	33.3%	29.7%	45.5%
Crime/Delinquency	3 months	54.5%	40.7%	< 56.5%	65.2%
	6 months	80.0%	30.6%	30.3%	38.9%
FUNCTIONING					
Sexual Development	3 months	52.9%	39.7%	47.8%	< 86.7%
	6 months	32.1%	30.0%	21.4%	60.0%
CARE INTENSITY & ORGANIZATION					
Service Permanence	3 months	51.8%	42.3%	< 57.8%	66.7%
	6 months	31.8%	35.0%	30.8%	37.5%
CAREGIVER NEEDS & STRENGTHS					
Physical/Behavioral Health	3 months	55.1%	44.0%	53.8%	40.0%
	6 months	28.9%	30.0%	< 56.0%	0.0%
Safety	3 months	53.6%	> 40.3%	< 68.2%	50.0%
	6 months	32.1%	26.8%	< 57.9%	
STRENGTHS					
Interpersonal	3 months	25.0%	46.8%	57.4%	61.9%
	6 months	13.3%	25.6%	< 41.9%	60.0%
Educational	3 months	50.0%	41.5%	< 55.0%	61.4%
	6 months	25.0%	26.0%	39.1%	36.4%
Optimism	3 months	25.0%	42.4%	< 60.3%	69.6%
	6 months	14.3%	30.3%	32.4%	40.0%

Note. Only items with a significant zero-order step effect at either 3 or 6 months are included in table. Arrows (>, <) refer to statistically significant differences ($p < .05$) in proportions of youth with no improvement overall. Unique step effect, controlling for all other significant linear and step effects across dimensions in multivariate analysis, is indicated above: aOR = 2.69, $z = 3.40$, $p < .001$.

Table 4
Proportions of Youth With Improvement in Both Depression And Antisocial Behavior at 3 Months and 6 Months Per CANS-MH Item Rating at Baseline

CANS-MH Item		Item Rating at Baseline			
		0	1	2	3
PROBLEM PRESENTATION					
Adjustment to Trauma	3 months	16.3%	13.1%	13.6%	8.0%
	6 months	47.2%	> 25.7%	34.0%	37.5%
Situational Consistency	3 months	5.6%	13.8%	14.0%	12.1%
	6 months	70.0%	> 31.0%	31.4%	37.5%
Temporal Consistency	3 months	8.3%	13.9%	12.4%	14.3%
	6 months	85.7%	> 31.9%	31.4%	33.3%
RISK BEHAVIORS					
Danger to Others	3 months	22.2%	16.9%	> ^a 8.0%	0.0%
	6 months	48.0%	32.2%	32.5%	20.0%
Social Behavior	3 months	20.4%	12.9%	12.7%	4.2%
	6 months	50.0%	> 28.9%	34.4%	36.4%
FUNCTIONING					
Family Functioning	3 months	22.2%	21.2%	> 10.2%	6.2%
	6 months	40.0%	41.4%	31.6%	26.5%
CARE INTENSITY & ORGANIZATION					
Service Permanence	3 months	14.9%	18.0%	> 6.3%	0.0%
	6 months	35.2%	31.7%	28.2%	50.0%
CAREGIVER NEEDS & STRENGTHS					
Physical/Behavioral Health	3 months	13.6%	15.6%	> 3.8%	< ^d 40.0%
	6 months	37.1%	34.3%	16.0%	66.7%
Supervision	3 months	11.3%	17.8%	> 3.2%	18.2%
	6 months	27.8%	36.3%	34.5%	25.0%
Involvement with Care	3 months	16.9%	11.7%	14.5%	10.0%
	6 months	34.3%	39.3%	> 22.2%	20.0%
STRENGTHS					
Family	3 months	27.8%	> 13.1%	10.8%	7.1%
	6 months	47.1%	40.7%	26.3%	16.7%
Interpersonal	3 months	20.0%	16.5%	10.1%	0.0%
	6 months	60.0%	43.3%	> 19.8%	20.0%
Educational	3 months	23.5%	13.8%	8.3%	15.7%
	6 months	65.0%	> 34.2%	24.6%	36.4%
Well-being	3 months	71.4%	> ^c 14.1%	11.1%	15.4%
	6 months	100.0%	46.7%	> 28.2%	20.0%
Optimism	3 months	41.7%	> 14.4%	> 6.1%	13.0%
	6 months	85.7%	> 39.4%	25.0%	20.0%
Spiritual/Religious	3 months	22.9%	11.3%	10.9%	12.5%
	6 months	72.2%	> 32.8%	25.0%	34.6%
Talents/Interests	3 months	25.9%	12.5%	14.1%	6.0%
	6 months	76.9%	> 38.7%	25.0%	31.6%
Inclusion	3 months	21.1%	17.1%	11.9%	10.6%
	6 months	80.0%	48.0%	> 29.3%	13.5%

Note. Only items with a significant zero-order step effect at either 3 or 6 months are included in table. Arrows (>, <) refer to statistically significant differences ($p < .05$) in proportions of youth with improvement in both depression and antisocial behavior. Unique step effects, controlling for all other significant linear and step effects across dimensions in multivariate analysis, are indicated above: ^a $OR = 0.37, z = 1.97, p < .05$; ^b $OR = 27.11, z = 2.88, p < .01$; ^c $OR = .02, z = 3.28, p < .001$.

Table 5

Proportions of Youth With Improvement in Antisocial Behavior Only at 3 Months and 6 Months Per CANS-MH Item Rating at Baseline

CANS-MH Item		Item Rating at Baseline			
		0	1	2	3
PROBLEM PRESENTATION					
Adjustment to Trauma	3 months	30.4%	31.5%	27.3%	32.0%
	6 months	15.1%	< 37.8%	26.4%	25.0%
Temporal Consistency	3 months	58.3%	41.8%	> 27.6%	24.1%
	6 months	0.0%	31.9%	29.1%	24.6%
RISK BEHAVIORS					
Danger to Self	3 months	32.8%	31.5%	19.1%	66.7%
	6 months	27.3%	31.5%	> 11.1%	100.0%
Crime/Delinquency	3 months	45.5%	37.2%	> 25.9%	21.7%
	6 months	0.0%	29.6%	28.9%	16.7%
FUNCTIONING					
School Achievement	3 months	25.0%	< 47.4%	> 26.5%	19.5%
	6 months	28.6%	31.7%	30.8%	22.9%
CARE INTENSITY & ORGANIZATION					
CAREGIVER NEEDS & STRENGTHS					
Safety	3 months	28.2%	38.7%	> 18.2%	50.0%
	6 months	27.4%	31.0%	10.5%	
STRENGTHS					
Educational	3 months	23.5%	37.4%	31.7%	20.0%
	6 months	10.0%	< 34.2%	29.0%	18.2%

Note. Only items with a significant zero-order step effect at either 3 or 6 months are included in table. Arrows (>, <) refer to statistically significant differences ($p < .05$) in proportions of youth with improvement in antisocial behavior only.