Access to services for juvenile court-involved youth in the United States: a social and neurobiological case for the juvenile mental health advocacy project model

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ACCESS TO SERVICES FOR JUVENILE COURT-INVOLVED YOUTH IN THE UNITED STATES: A SOCIAL AND NEUROBIOLOGICAL CASE FOR THE JUVENILE MENTAL HEALTH ADVOCACY PROJECT MODEL

by

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DEDICATION

This thesis is dedicated to those who have been harmed by injustices in our legal and medical systems, with deep sorrow and the hope that these wrongs might be rectified for future generations.
I owe a huge thank you to the Juvenile Mental Health Advocacy Project evaluation team, particularly Trish Elliott and Emily Feinberg, for allowing me to come on board a project that has helped me to grow tremendously. I also want to thank Dr. Hee-Young Park for serving as my advisor during a transformative two years. Thank you for being a mentor and instilling in me a positive work ethic and skills for the future. Finally, thank you for believing in me.
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ELIZA NGUYEN

ABSTRACT

Youth involved in the juvenile justice system have a well-documented need for mental, behavioral, and emotional health services, but they face barriers to accessing appropriate and timely care. Research indicates a high need among youth involved in both the juvenile justice and mental health systems—or youth with dual involvement—and few programs addressing their need exist. The social risk factors of juvenile justice involvement are well-defined and studies indicate that the intersectionality of historically oppressed identities put certain youth at high risk for dual involvement. In particular, racial/ethnic minorities and female youth with mental health needs appear to be at-risk populations for dual involvement; they also have substantial barriers to care. Moreover, the neurobiological characteristics of mental illness among youth have begun to be characterized. Studies of the functional and structural markers of mental illness show that youth with conduct disorder, oppositional defiant disorder, attention deficit hyperactivity disorder, and depression show neurological changes that have behavioral correlates predisposing young people with these diagnoses to juvenile justice involvement where they have limited healthcare resources. Evidence from these fields—social science and neuroscience—provide a justification for programs that work across systems to provide dually involved youth access to health, educational, and social services. In
Massachusetts, the Juvenile Mental Health Advocacy Project (J-MHAP) operates a pilot program in the Middlesex and Essex County Juvenile Courts, with the primary goal of providing these youth access to the multidisciplinary care they require. Distal goals include preventing further movement into the criminal justice system, and saving costs across various agencies and interest groups. Operating through court-appointed Mental Health Advocates (MHAs), J-MHAP is a unique model that uses advocates within the court system to coordinate services and improve access. It is a model that could make strides toward reducing injustices within the legal and healthcare systems.
# TABLE OF CONTENTS

TITLE .............................................................................................................................i
COPYRIGHT PAGE ..........................................................................................................ii
READER APPROVAL PAGE ............................................................................................iii
DEDICATION ....................................................................................................................iv
ACKNOWLEDGMENTS ...................................................................................................... v
ABSTRACT ...................................................................................................................... vi
TABLE OF CONTENTS ..................................................................................................... viii
LIST OF ABBREVIATIONS ............................................................................................ x
INTRODUCTION ................................................................................................................ 1
  Modern institutions and mental illness ........................................................................ 2
  Youth in the criminal justice system ............................................................................ 4
PUBLISHED STUDIES ...................................................................................................... 9
PART I. SOCIAL DETERMINANTS OF DUAL INVOLVEMENT .............................. 14
  Social determinants of juvenile justice involvement ................................................ 15
  Social determinants of dual involvement ................................................................... 19
  The school-to-prison pipeline ..................................................................................... 23
PART II. NEUROLOGICAL CORRELATES OF JUVENILE JUSTICE INVOLVEMENT ........................................................................................................... 25
<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adolescent Neurological Development</td>
<td>27</td>
</tr>
<tr>
<td>Neurological Correlates of Common Mental Illnesses in Adolescents</td>
<td>31</td>
</tr>
<tr>
<td>Conduct Disorder and Oppositional Defiant Disorder</td>
<td>33</td>
</tr>
<tr>
<td>Attention Deficit Hyperactivity Disorder</td>
<td>36</td>
</tr>
<tr>
<td>Comorbid CD/ODD and ADHD</td>
<td>40</td>
</tr>
<tr>
<td>Depression</td>
<td>42</td>
</tr>
<tr>
<td>A look at Justice-Involved Youth</td>
<td>43</td>
</tr>
<tr>
<td>Limitations</td>
<td>44</td>
</tr>
<tr>
<td>PART III. THE JUVENILE MENTAL HEALTH ADVOCACY PROJECT</td>
<td>46</td>
</tr>
<tr>
<td>Juvenile Mental Health Advocacy Project Model</td>
<td>47</td>
</tr>
<tr>
<td>Preliminary Evaluation Findings</td>
<td>48</td>
</tr>
<tr>
<td>CONCLUSION</td>
<td>50</td>
</tr>
<tr>
<td>APPENDIX 1: DSM-V DIAGNOSTIC CRITERIA FOR OPPOSITIONAL DEFIANT DISORDER</td>
<td>53</td>
</tr>
<tr>
<td>APPENDIX 2: DSM-V DIAGNOSTIC CRITERIA FOR CONDUCT DISORDER</td>
<td>55</td>
</tr>
<tr>
<td>APPENDIX 3: DSM-V DIAGNOSTIC CRITERIA FOR ATTENTION DEFICIT HYPERACTIVITY DISORDER</td>
<td>59</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>64</td>
</tr>
<tr>
<td>CURRICULUM VITAE</td>
<td>83</td>
</tr>
</tbody>
</table>
LIST OF ABBREVIATIONS

AAP ................................................................. American Academy of Pediatrics
ADHD ............................................................. Attention Deficit Hyperactivity Disorder
APA ................................................................. American Psychological Association
BHJJ ................................................................. Ohio Behavioral Health/Juvenile Justice Initiative
CD ................................................................. Conduct Disorder
J-MHAP ......................................................... Juvenile Mental Health Advocacy Project
MHA ................................................................. Mental Health Advocate
NCD ................................................................. National Council on Disability
ODD ............................................................... Oppositional Defiance Disorder
OJJDP ............................................................. Office of Juvenile Justice and Delinquency Prevention
SAMSHA ....................................................... Substance Abuse and Mental Health Services Agency
SES ............................................................... Socioeconomic Status
INTRODUCTION

There is a long history of institutionalizing individuals with mental illness, globally. Formal origins of public asylums for individuals considered ‘insane’ trace back to 14th century England, when Bethlem Royal Hospital began caring for people with mental illness (Whittaker, 1947). The prevailing image of the mentally ill at that time was a bestial creature incapable of reasoning and thus sentenced to confinement and brutal punishment. The perceived animalistic nature of these individuals dictated the troubling conditions in which they lived: rooms had few windows, they ate a poor diet, they had inadequate clothing, and poor hygiene (Andrews, 1991). Many were restrained in chains and the institutions were often tourist sites for the public to gawk at the mentally ill for entertainment (Andrews, 1991). These institutions allowed the systematic dehumanization of individuals with mental illness, establishing a long history of injustice.

In the 18th century, psychiatric practice shifted to a more humanitarian lens, with attempts to understand the nature of psychiatric illnesses. A new model of “moral therapy,” famously championed by French physician, Phillipe Pinel—who has since been mythologized as the liberator of the mentally ill—signified positive change, though it fell short of expectations (Digby, 1983). While moral therapy focused on humanizing patients, psychiatric institutions rarely offered necessary therapy or rehabilitation—they remained custodial rather than curative (Grobb, 2005). According to Symonds (1994), the effect of correctional facilities during this period “was the segregation of insane people.” They were effectively removed from society with little hope of recovery or reentry.
Modern institutions and mental illness

We can trace the history of the psychiatric institution from the aforementioned asylum period, through the deinstitutionalization movement in the United States—which sought to bring mental healthcare into community settings—to the subsequent rise of mass incarceration—the modern version of the asylum that currently exists in the United States (Rembis, 2014). Though psychiatric institutions were largely replaced by community-based outpatient clinics, their function of providing custodial care to individuals with mental illness has been adopted by the modern prison system (see: Ford, 2015; Rembis, 2014).

A recent report by the Substance Abuse and Mental Health Services Administration (SAMSHA) reported that up to 34% of jail inmates have a “recent history” of disorders such as depression, bipolar, and posttraumatic stress disorder, while up to half reported having any type of mental illness, including anxiety disorders and psychosis (SAMSHA, 2015). Moreover, over 70% reported having ever been diagnosed with substance use disorder. Notably, these rates “far surpass those found in the general population” (SAMSHA, 2015). According to the National Alliance on Mental Illness, approximately 6.9% of the population in the United States suffers from major depression, while 18.1% have anxiety, 2.6% suffer from bipolar disorder, and just over 1% have been diagnosed with schizophrenia, much lower than rates of mental illness among the prison population (National Alliance on Mental Illness, 2013). SAMSHA’s (2015) report cites changes in drug laws and a lack of publically provided mental health services as leading causes of this disparity.
In her book *The New Jim Crow*, Michelle Alexander (2012) highlights the systematic targeting of racial and ethnic minorities by the legal and criminal justice systems, outlining the long history of injustice leading up to the current state of mass incarceration. While Alexander (2012) focuses primarily on the structure of the legal system in the United States and the historical events that have shaped it, her book provides an important understanding of the criminalization of mental illness, in particular, substance use disorders. Sensationalized events and campaigns, such as the war on drugs, have led, not only to a public misunderstanding of mental illness, but to unjust discrimination against the mentally ill such that they are disproportionately incarcerated and consequently denied treatment (Ford, 2015; Alexander, 2012).

The medical injustices perpetuated by the criminal justice system contribute to the marginalization of minority and underserved populations, who suffer as a result of implication in criminal activities. Specifically, accessing physical and mental health services within the court system remains a challenge for incarcerated populations. Psychiatric services in prisons rely substantially on medication and sedation, and focus much less on rehabilitation (Barnert, Perry, & Morris, 2016). Individuals released from prisons leave lacking continuity of care and the resources to obtain care; often, they cycle in and out of prisons (Woods, Lanza, Dyson, & Gordon, 2013). Even individuals who do not receive a prison sentence, but are nonetheless justice-involved, are rarely directed to mental health services. Consequently, people with mental illness who are involved in the criminal justice system face systematic discrimination that prevents them from
prospering, keeps them institutionalized, and often denies them access to appropriate mental health services.

However, a new option for justice-involved individuals needing mental health services has been developed over the past decade. The U.S. Department of Justice and SAMSHA currently collaborate to change the norms around providing healthcare to individuals with mental illness rather than sentencing them to an institution. The organizations have funded the creation of mental health courts nationwide, which seek to divert individuals with mental illness from prisons to community-based mental health treatment under the supervision of the judiciary (Bureau of Justice Assistance, n.d.). People going through the mental health court process resolve their cases with minimal punishment and fewer repercussions following status hearings, which ensure compliance with treatment (Bureau of Justice Assistance, n.d.). Still a new institution, the mental health courts seek to ameliorate the problematic history of institutionalizing people with mental illness, has led to its criminalization. As of 2005, there were approximately 125 of these courts in operation across the country (Bureau of Justice Assistance, n.d.).

Youth in the criminal justice system

By the 18th century, the first traces of a juvenile corrections system was developing in the United States. Facilities specifically for the housing of juvenile offenders were established in large cities and youth were understood to be developmentally different from adults (Sickmund & Puzzanchera, 2014). In 1899, the first juvenile court was established in Illinois. According to a report by the Office of Juvenile Justice and Delinquency Prevention (OJJDP), the nascent courts operated under
the philosophy that court-involved youth required state protection in order to receive appropriate rehabilitation; it did not emphasize punishment (Sickmund & Puzzanchera, 2014). However, courts were relaxed in procedure and activity, and rates of juvenile offending continued to increase throughout the 20th century, leading to the formalization of juvenile court processes. Though states still maintained an emphasis on rehabilitation and child welfare rather than punishment, harsher penalties and the option to be tried as an adult in criminal court surfaced during this period (Sickmund & Puzzanchera, 2014).

Today, youth before juvenile courts are classified as delinquents or status offenders. Delinquents are youth who commit traditional crimes, such as vandalism, arson, and theft; status offenders are in violation of laws such as those pertaining to truancy, alcohol possession, or running away from home (Sickmund & Puzzanchera, 2014). Delinquent youth often receive a probation sentence along with additional orders, such as “restitution to the community or victim,” though some are placed in residential facilities resembling, to varying degrees, prisons (Sickmund & Puzzanchera, 2014).

According to statistics from the OJJDP, juvenile courts formally processed 1.6 million delinquency cases in 2000. Of these cases, approximately one-quarter resulted in youth being placed in a detention or other residential facility (Puzzanchera, Stahl, Finnegan, Tierny & Snyder, 2004). National estimates of the number of status offenses is not available due to variations in processing and jurisdiction, though it has been estimated that approximately 17% of runaway cases and 10% of “ungovernability” cases result in detainment or placement (Puzzanchera, Stahl, Finnegan, Tierny & Snyder, 2004). Status

1 The term ‘ungovernability’ refers to youth whose parents are unable to appropriately control them.
offenders in states that receive funding from the OJJDP are prohibited from being
detained unless their offense violates a court order, as mandated in the Juvenile Justice
Despite these regulations, a 2003 investigation by the Special Investigations Division of
the U.S. House of Representatives Committee on Government Reform revealed that
detention centers in 33 states hold mentally ill youth while they wait for mental health
services to become available (Bender, 2004). This injustice perpetuates the history of
institutionalizing the mentally ill and fails to work toward the rehabilitation of a
vulnerable population.

The physical health of this population has recently been characterized, with
evidence indicating an immense level of need (Golzari, M., Hunt, S., & Anoshiravani, A.,
2006). Studies have found that as many as 76.9% of incarcerated youth report a
preexisting medical condition at the time of admission (American Academy of Pediatrics,
2011). Moreover, rates of dental needs, traumatic injuries, and sexually transmitted
diseases among the justice-involved youth exceed those observed in the general
Youth with low socioeconomic status (SES), particularly those living in “traumatic
environments” face an additionally increased burden of illness as a result of poor
housing, poor food security, and unsafe living situations (American Academy of
Pediatrics, 2011). Evidence also suggests that there is a lasting effect of juvenile
incarceration on mortality (Callahan, Cocozza, Steadman, &Tillman, 2012; Coffey, Veit,
Furthermore, rates of mental illness among court-involved youth are strikingly high, though a minority of youth actually receives services. According to Barnert, Perry and Morris (2016), approximately “two-thirds of incarcerated boys and three-quarters of incarcerated girls meet criteria for at least one psychiatric diagnosis.” While data on the mental health of status offenders is not available, several sources suggest that they have unmet mental health needs. One such study estimated that half of youth on probation have a severe mental illness (Lyons, Baerger, Quigley, Erlich & Griffin, 2001). Among the most prevalent diagnoses in the juvenile justice population are behavioral disorders, which include attention deficit hyperactivity disorder (ADHD) and conduct disorder (CD), depression, and substance use; rates of co-occurring mental illness, or comorbidities, among this population are also elevated (Callahan, Cocozza, Steadman, & Tillman, 2012). Moreover, Burke, Mulvey & Schubert (2015) found that only 20% of youth in a sample of adolescents with mental health needs involved with the courts received mental health services two and three years after baseline measures. Thus, an apparent unmet need exists for this population.

Similar to their adult counterparts, juvenile mental health courts have emerged over the past several years, though only about 40 in the country had been identified in 2011 and outcomes remain unknown (Callahan, Cocozza, Steadman, & Tillman, 2012). These mental health courts are designed to address the needs of youth with mental illness beyond what the traditional court system can offer. For example, there is a separate court docket for youth with mental health needs indicating special attention; they are often required to receive community supervision; and a multidisciplinary team commonly
oversees the cases (Callahan, Cocozza, Steadman, & Tillman, 2012). Youth appearing before these courts and in the juvenile justice population, generally, comprise a population with a substantial need for services, though little research has been done to explore justice-involved youth with mental health needs.

This thesis seeks to understand the unique needs and characteristics of youth with mental illness in the juvenile justice system—also referred to as dually involved youth or youth with dual involvement—in order to justify the development of multisystemic programs that will be most successful in improving their mental and behavioral health outcomes. After presenting a review of the literature on existing programs for this population, the first section of this thesis will highlight the social and ecological risk factors of dual involvement, arguing that the intersectionality of historically oppressed identities increases the likelihood that a youth with mental health needs will encounter the juvenile justice system. The next section highlights neuroscience research on adolescent brain development and the unique neurological characteristics of youth with mental illness. It will focus specifically on the neurobiology of disruptive behavioral disorders, ADHD, and depression, arguing that youth with these diagnoses exhibit neurological changes that have behavioral correlates predisposing them to characteristics targeted by the juvenile justice system. Finally, a case study of the Juvenile Mental Health Advocacy Project (J-MHAP)—a Massachusetts-based program to increase access to appropriate and timely services for court-involved youth—will be presented. Through the work of Mental Health Advocates (MHAs), the program reaches multiple systems to improve coordination and access to care among youth with dual involvement. Ultimately,
this thesis argues that court-involved youth have substantial unmet mental health needs that should be addressed in the community through coordination of health, education, and social services. I argue that models like J-MHAP have the potential to meet the complex multisystem needs of this population.

PUBLISHED STUDIES

There are only a handful of programs in existence that aim to increase access to health, educational, and social services for youth with dual involvement, and few have been evaluated. Among them are diversion programs, which attempt to steer youth away from the juvenile justice system and into community settings; however, they vary significantly in scope, structure, and programmatic activities. Only diversion programs with targeted activities spanning multiple systems and that have been evaluated will be considered in this section, though it is important to note that vastly different diversion program models exist.

One of the best-established and thoroughly evaluated programs of this type is the Ohio Behavioral Health and Juvenile Justice initiative (BHJJ), a statewide initiative to improve outcomes for “multi-need, multisystem youth and their families” (Kreschmar, Butcher, Kanary, and Devens, 2015). The program works through multidisciplinary teams made up of individuals in juvenile justice, healthcare, educational, and social services that collaborate across agencies to provide tailored services to court-involved youth with felony charges. Established in 2005, the program appears to have positive
outcomes in many areas for Ohio’s highest risk youth. From 2013-2015, 72% of youth in the program completed their treatment plan and showed “statistically significant improvements” in mental health, daily functioning, school and other social activities; they moreover demonstrated decreased substance use (Kreschmar, Butcher, Kanary, and Devens, 2015). Seventy percent of youth who completed the BHJJ treatment, did not recidivate in the year following treatment and only 3.5% were incarcerated after program enrollment (Kreschmar, Butcher, Kanary, and Devens, 2015). The evaluation was limited by sample size constraints, though the results point to positive outcomes.

Another well-developed program is Reclaiming Futures, a model that assists youth in the juvenile justice system with substance abuse problems to decrease their use and improve health outcomes (Butts, Roman & Gitlow, 2009; Willison et al., 2010). An integral aspect of the model’s six stages is care coordination, which involves families and providers from multiple areas of care within the community. Like BHJJ, Reclaiming Futures is guided by the idea that youth involved in both the justice and mental health systems require treatment that goes beyond what exists in singular systems—treatment that is grounded in the community and accomplished via collaboration between juvenile justice workers, families, providers and, in some instances, schools. Youth in the program had unique opportunities to build self-efficacy by serving on youth advisory councils, participating in community-based activities, and fostering relationships with adult mentors, during their course of mental health treatment (Willison et al., 2010). Because the program was funded in different locations across the country, each site differed according to available resources (Willison et al., 2010). While evaluation results
indicated that the program had a positive impact in some systems, outcomes for youth varied across sites. For example, in Santa Cruz, evaluation findings suggested an improvement in recidivism rates, while the New Hampshire and Chicago programs found inconclusive results, and youth at the Seattle site were more likely to be reinstitutionalized as compared to youth not in the program (Butts, Roman & Gitlow, 2009).

Utilizing a similar paradigm, the Connections program in Clark County, Washington follows a wraparound model, which “refers to a process of organizing and coordinating service delivery for children and families with complex needs involved with multiple service providers” (Pullman et al., 2006). Wraparound programs provide services that encompass education, housing, healthcare, and juvenile justice, among other areas. In Clark County, Connections coordinates services for youth involved in the juvenile justice system who also receive public mental health services. To improve collaboration across systems, the Connections teams are comprised of “a mental health professional…a family assistance specialist, a probation counselor, and a juvenile services associate (Pullman et al., 2006). While each provider specializes in a specific domain, regular meetings involving the care team, youth, and families allow the program to unite the unique systems and agencies serving these at-risk youth in an individualized manner. Connections also aids youth in transitioning out of the probationary period by connecting them with community-based services for continued care (Pullman et al., 2006).
An evaluation study comparing youth in Connections to similar youth not in the program found significantly better outcomes for youth receiving wraparound care. They were significantly less likely to commit an offense after program involvement, including a felony offense; they additionally spent significantly less time in detention centers than their peers who were not in the program (Pullman et al., 2006). However, it is important to note that the groups in the evaluation study were not randomized and thus the treatment and control groups in the two samples were different, which may have caused differential outcomes.

Jeong, Lee and Martin (2013) conducted an evaluation of the Special Needs Diversion Program (SNDP)—a program targeting dually involved youth in Texas. The SNDP model mirrors that of the Connections program in that it operates via a multidisciplinary service team, delivering tailored community-based care to at-risk youth (Jeong, Lee & Martin, 2013). Families and care teams collaborate extensively in their work diverting youth from juvenile justice involvement and residential placement. The evaluation found that SNDP significantly reduced recidivism rates in the treatment group as compared to youth in the control group who did not receive specialized services (Jeong, Lee & Martin, 2013). An important limitation of the evaluation was that the study population was informally, rather than formally, involved in the juvenile justice system; results from one subpopulation within this system may not be generalizable to others.

Wraparound programs structured similarly to Connections and SNDP have also been evaluated, though the evaluations have substantial limitations. Small sample sizes and internal validity threats dampen the impact of the study findings, as these factors
potentially misrepresent the programs’ real effects (Anderson, Wright, Kooreman, Mohr & Russell, 2003; Carney & Buttell, 2003; Kamradt, 2000). While evaluation findings for these programs should be considered with caution, the results show reduced recidivism rates, decreases in residential service use, and improvements in educational and social outcomes in each of the cases.

Other models have touched on similar theories presented here. For example, Multisystemic therapy has been used to provide skills to youth, their families, and other adults in the community to “restructure a youth’s ecology to support prosocial development and reduce delinquent behaviors” (Mitchell, Bender, Kishna & Mitchell, 2010). Using elements of social ecological theory to support the development of ecological resources, MST incorporates different areas of a youth’s life into therapeutic work; however, MST does not cross service systems and does not take as integrative of an approach as the programs presented above and thus is inherently different (Mitchell, Bender, Kishna & Mitchell, 2010). Additionally, in the UK and in Australia, a trend in service delivery has emerged in court liaison programs for individuals with mental illness (Sly, Sharples, Lewin, & Bench, 2009; Brett, 2010; McInerny et al., 2013). The rationales underlying these programs are quite similar to the domestic programs presented, though they have not been tailored to meet the specific needs of adolescents and focus primarily on adults.

These studies highlight the need for comprehensive research on the health of court-involved youth with mental health needs, their service use, and the programs that serve them. The lack of rigorous research is an important barrier to understanding the
mental health of justice-involved youth. A further limitation is that recidivism is the most common outcome evaluated in evaluations of these types of programs, leaving health and service use outcomes largely ignored. The existing data is unsuccessful in quantifying impact in these two areas, which is important because these data could be vital in characterizing the disposition of youth involved in the justice system and developing programs to meet their needs. Health and service data could inform system changes to reduce the burden of mental illness among this population.

PART I. SOCIAL DETERMINANTS OF DUAL INVOLVEMENT

A handful of complex social determinants are correlated with initiation and persistence in the juvenile justice system, including race/ethnicity, SES, and child maltreatment (Burfeind & Bartusch, 2010). The structure of the juvenile justice system, itself, contributes to the complexity of these determinants. Youth can become involved in the court through an array of offenses, thus the idea of court involvement encompasses a broad spectrum of case types. As noted previously, cases are categorized as either delinquency cases or status offenses. Juvenile delinquency cases are defined as offenses “committed by juveniles that, if committed by an adult, could result in criminal prosecution” (Puzzanchera, Stahl, Finnegan, Tierny & Snyder, 2004). They include offenses committed against a person, against property, drug law violations, and public
order offenses. Status offenses are offenses “that are illegal only because the person committing them is of juvenile status” (Puzzanchera, Stahl, Finnegan, Tierny & Snyder, 2004). Running away from home, truancy, ungovernability, and liquor law violations have been noted as the major status offense categories (Development Services Group, Inc., 2015). Thus vastly varying social determinants influence whether a youth comes in contact with the juvenile justice system. Using a social ecological approach, this section will explore the most significant determinants of justice involvement for dually involved youth—those who receive services from both the juvenile justice and mental healthcare systems. It will first review the social determinants of juvenile justice involvement for all youth and then assess the literature on dual involvement, hypothesizing that the intersectionality between historically oppressed identities puts certain youth at greater risk of dual involvement and worse health outcomes.

**Social determinants of juvenile justice involvement**

Data on social risk factors for youth involvement in the juvenile justice system is sparse, though a few themes have emerged from the research. The existing data suggest that minority youth and youth with low SES are at increased risk of involvement in the juvenile justice system (see: Hawkins et al., 2000; Cottle, Lee & Heilbrun, 2001; Shader, n.d.; Sickmund & Puzzanchera, 2014). National statistics on juvenile offending reveals that African American youth comprised 31% of arrests for serious juvenile offenses, and

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*According to the OJJDP, crimes against a person are categorized as the following: criminal homicide, forcible rape, robbery, aggravated assault, simple assault, other violent sex offenses, and other person offenses. Property crimes include: burglary, theft, motor vehicle theft, arson, vandalism, trespassing, stolen property offenses, and other property offenses. Public order offenses are defined as: obstruction of justice, disorderly conduct, weapons offenses, liquor law violations, nonviolent sex offenses, and other public order offenses (Puzzanchera, 2004).*
51% for violent crimes in 2010, though they made up 17% of the total United States population at that time (Sickmund & Puzzanchera, 2014). Moreover, a report by the American Academy of Pediatrics (AAP) highlights the substantial relationship between low SES and youth justice involvement, noting, “poverty is likely to be the underlying factor that most influences trends in juvenile crime” (AAP, 2011).

The AAP report highlights the strong correlation between low SES, minority status, health status, and juvenile justice involvement, revealing associations that describe how historical oppression has shaped the juvenile justice population. Moreover, because low SES youth are more likely to lack insurance coverage and a regular provider, they are more likely to receive inadequate or no physical and mental healthcare, which could affect their risk of juvenile justice involvement and consequent health outcomes.

Looking at family functioning, Gavazzi, Bostic, Lim, and Yarcheck (2008) studied the moderating effect of race/ethnicity and gender on juvenile justice involvement, revealing a significant interaction between these variables. On measures of family conflict among justice-involved youth, African American females reported the highest levels of conflict, followed by Caucasian females. Male youth reported the lowest conflict levels and did not differ significantly by race (Gavazzi, Bostic, Lim, & Yarcheck, 2008) Importantly, Graves, Frabutt and Shelton (2007) have noted that because female youth have historically been granted “chivalrous treatment” by the courts, they present with more challenging cases and complex problems by the time they are institutionalized. Recognizing the overrepresentation of minority youth in the juvenile justice system, as well as the differential treatment of women, one can construct a web of interconnecting
oppressive factors that may contribute to the demographics of youth involved in the juvenile justice system. Understanding the relationships between multiple factors could be impactful in designing systems and programs that protect at-risk youth.

Furthermore, research has revealed interpersonal and community level determinants that play a role in juvenile justice involvement. Of those, family relationships, school functioning, and community characteristics stand out as primary contributing factors. A meta-analysis of 66 studies characterizing predictors of youth violence cites child maltreatment, low parental involvement, family conflict, and separation from one or both parents among the family factors contributing to violence in young people (Hawkins et al., 2000). Tarolla, Wagner, Rabinowitz, and Tubman (2002) found similarly reported risk factors across several studies, adding high family stress to the list.

Contributing to the burden of social problems justice-involved youth face are difficulties related to schools, specifically low school attendance, commitment, and achievement. A summary of findings from the Survey of Youth in Residential Placement found that 21% of youth in residential facilities reported that they were not enrolled in school at the time of placement and 61% said they had been expelled or suspended in the year prior to placement (Sedlak & McPherson, 2010). The survey also found that 48% of these young people were functioning below their appropriate grade level and 30% said they had a learning disability (Sedlak & McPherson, 2010). Across the board, these statistics reveal dispositions far worse than nationally reported averages for each
measure. The study suggests that these vulnerable youth may not be receiving the services required to meet their educational needs.

Finally, community characteristics further predict juvenile justice involvement. The OJJDP meta-analysis found that along with poverty, community disorganization and exposure to crime and violence were risk factors for youth violence. A study by Chung and Steinberg (2006) assessed the neighborhood, peer, and parental factors associated with juvenile offending in a sample of male offenders in Philadelphia enrolled in a longitudinal juvenile justice study. Results revealed that interactions between community and interpersonal factors might account for delinquency risk. Via self-report measures, they concluded that neighborhood disorder, which captured variables such as physical appearance and gang activity, is directly related to youth-reported delinquent behavior (Chung & Steinberg, 2006). Moreover, neighborhood social cohesion, which includes social integration and intergenerational relations, was indirectly related to delinquency through its interaction with parental and peer relationships (Chung & Steinberg, 2006). That is, youth from neighborhoods with low social cohesion and poor parental and peer relationships had the highest risk of delinquency, though positive interpersonal relationships proved to be protective. The association indicated that complex relationships between social-ecological levels that have not yet been thoroughly explored.

Ludwig, Duncan, and Hirshfield’s (2001) study on the Moving to Opportunity program in Baltimore supports these findings as well as the need for further examination. They found that among families receiving federal assistance to move from high- to low-poverty communities, juvenile violent crime rates decreased up to 50% as compared to
control families. They note potential confounding factors that could contribute to this finding, such as differences between local criminal justice systems that would be important to understand in future studies, though their results point to community level factors impacting justice involvement (Ludwig, Duncan, and Hirshfield, 2001).

While other factors have been associated with juvenile justice involvement, those highlighted above are some of the most salient and well supported. Interactions between poverty, gender, and race/ethnicity are vital to the understanding of the juvenile justice population and the risk of juvenile offending. Moreover, poverty and race/ethnicity are consistent underlying variables whose effect seems omnipresent. Understanding these factors has the potential to target appropriate groups who are affected by these fundamental determinants.

**Social determinants of dual involvement**

Social risk factors for youth involvement in both the mental health and juvenile justice systems have not been well characterized, though available research suggests that there are unique determinants of dual involvement. The few studies that have attempted to understand this population and its relationship to justice-involved youth without mental health needs have begun to elucidate the specific risk profiles of youth with dual involvement. Importantly, the literature indicates that the youth who are most impacted by dual involvement are those whose intersecting identities include historically oppressed groups—specifically oppressed racial and gender groups. This research could inform system change and program development in order to better serve the needs of high-risk youth.
Evaluation data from BHJJ provides demographics for youth enrolled in the program. Overall, demographic data indicates that many underserved youth receive services from the program. Youth in BHJJ were more often male (58.4%) than female (41.6%) and more often Caucasian (52.3%) than non-Caucasian (39.3%) (Kretschmar, Butcher, & Flannery, 2014). However, in later years, program demographics shifted such that between 2011 and 2013, it served more minority youth (57.1%) than Caucasian youth, as well as more low SES youth (Kretschmar, Butcher, & Flannery, 2014). The average household income for families in the study was between $20,000 and $24,000, with almost half (47.7%) reporting incomes less than $20,000 (Kretschmar, Butcher, & Flannery, 2014). In 2013, the Federal Poverty Level for a family of 4 was $23,550 (“2013 Poverty Guidelines,” 2015). It is likely that many of these families fell into this income bracket, or were marginally above it.

Moreover, BHJJ youth expressed challenges across several social ecological levels, including interpersonal and community levels. Over 60% of youth lived in single-family households and approximately 15% were living with people other than their biological parents during the time of the study—statistics that indicate high levels of family stress and/or conflict (Kretschmar, Butcher, & Flannery, 2014). Hawkins et al. (2000) reported that some studies found an association between having a single-parent family and being convicted of violence offenses in adolescence, though they indicated a need for multivariate studies on this phenomenon. Moreover, over one-third of BHJJ enrollees received mostly grades of Ds and Fs in school at time of enrollment; 29% reported receiving mainly Cs and Ds (Kretschmar, Butcher, & Flannery, 2014). Poor
school performance could be linked to learning problems, low attendance levels, and lack of engagement in school, among other factors. While this captures only youth in the program and not all dually involved youth, this data can serve as a starting point to understanding this population’s characteristics.

Two important studies by Gavazzi, Bostic, Lim and Yarcheck (2008) and Graves, Frabutt, and Shelton (2007) assessed social risk factors for dually involved youth. Both looked at the intersectionality between race, gender and mental health status on dual involvement among their study populations, which revealed important preliminary findings. Gavazzi, Bostic, Lim and Yarcheck (2008) sampled court-involved youth and assessed their mental health symptoms, characterized as externalizing and internalizing symptoms. The authors examined the interaction between race/ethnicity, gender, and family functioning in a sample of court-involved youth with mental health needs. In general, they found that female adolescents exhibited more internalizing symptoms (for example, depression or anxiety) than male adolescents who largely reported externalizing symptoms (such as hyperactivity); however, when analyzed by racial group, the data indicated that African American females reported greater externalizing symptoms (Gavazzi, Bostic, Lim & Yarcheck, 2008). They note the significance of this finding as externalizing behaviors are related to exposure to violence or abuse. Moreover, for African American youth overall, they found that family functioning mediated the relationship between gender and mental health symptoms (Gavazzi, Bostic, Lim & Yarcheck, 2008). Importantly, the authors commented that observed racial differences in their study could be due to challenges arising from socioeconomic inequality, such as
“unemployment, lack of health and mental health insurance, a pileup of family transitions, and/or living in a dangerous neighborhood” (Gavazzi, Bostic, Lim & Yarcheck, 2008). Nevertheless, their results demonstrate the impact of intersecting social identities that have historically been disadvantaged—namely race and gender, and potentially SES—on dual involvement.

Graves, Frabutt, and Shelton (2007) sampled youth from a community mental health program and analyzed data from individuals who claimed they had been involved in the court system. While Graves, Frabutt and Shelton (2007) did not find significantly higher dual involvement among racial/ethnic minorities alone, they found significant differences in youth with intersecting identities. Female adolescents with mental illness were determined to be more severely impaired than their male counterparts who were involved in the juvenile justice system. As previously noted, Gavazzi, Bostic, Lim and Yarcheck (2008) report that adolescent girls are stereotypically more challenging to work with; this is in part due to the severity of their co-morbid mental health diagnoses. African American females, moreover, were more likely to be dually involved than Caucasian females, though there was not an overall significantly significant difference between the number of African American and Caucasian youth who were involved in both the juvenile justice and mental health systems. The authors hypothesized that the observed difference in symptom severity between male and female youth could be due to the historically “chivalrous treatment of female offenders in the initial stages of criminal processing,” a discriminatory process that potentially leads to a neglect of mental health needs and worse overall outcomes for justice-involved women (Graves, Frabutt, &
Shelton, 2007). Graves, Frabutt and Shelton (2007) did not find differences in dual involvement across socioeconomic levels and also found that it was not predicted by school involvement. They found that for all youth, the number of living situation transitions was significantly correlated with dual involvement. While further studies on this population should be done, these findings are important, because SES and school involvement have been noted as significant predictors of juvenile justice involvement overall. Together, these studies reveal findings indicating that youth whose intersecting social identities encompass historically oppressed groups may be at risk for dual involvement. They point to key differences between the dually and singularly involved populations, which could inform future policy decisions and support further research.

The school-to-prison pipeline

Arising out of “zero tolerance” policies that became common in schools during the 1990s, the school-to-prison pipeline has been implicated in prejudicially involving youth in the juvenile justice system and increasing rates of youth incarceration (Wald & Losen, 2003). The pipeline “refers to policies and practices that push the nations schoolchildren, especially those most at risk, out of classrooms and into juvenile and criminal justice systems” (National Council on Disability, 2015). The AAP (2013) notes that many schools have used the zero-tolerance trend to discipline low-level offenses such as truancy and verbal disrespect, as opposed to the violent and dangerous offenses it was meant to address.

These policies have contributed to the state of the juvenile and adult justice systems today. Since 1974, the number of students suspended from schools has almost
doubled, though harsh policies have disproportionately affected racial minority youth who often attend schools with harsher disciplinary practices than those of their Caucasian counterparts (Wald & Losen, 2003). Wald and Losen (2003) report that while African American students make up 17% of students in the United States, they represent 34% of individuals suspended from school. They also report findings from one study suggesting that minority youth are punished more severely for mild infractions than white students in similar situations. As such, the authors report that as of 1997, 68% of all state prison inmates had not received a high school diploma. Over one-third of this population reported academic or behavioral problems as the primary reason for dropping out, while only 11% stated leaving school because of a criminal conviction (Wald and Losen, 2013). These reports show that the school-to-prison pipeline unnecessarily takes youth out of schools and differentially impacts underserved minorities.

Not only are minority youth differentially affected by the school-to-prison pipeline, youth with disabilities—including learning disabilities and mental illness—also appear to be unjustly impacted. A report by the National Council on Disability (NCD) (2015) has described this phenomenon. Though students with disabilities represent 12% of all students in the United States, they make up 25% of school-related arrests (NCD, 2015). For underrepresented minority youth with disabilities, 27% of males and 19% of females were suspended at least one time in the 2011-2012 school year, effectively segregating these students from their non-minority and/or non-disabled peers. Moreover, the report noted that while African American youth comprised 18.7% of the population of disabled students, they were 49.9% of disabled youth in correctional facilities (NCD,
These data suggest that discriminatory practices and inadequate educational and mental health services facilitate these youth entering the juvenile justice system. The statistics describing educational attainment highlight the need to keep youth in schools and provide them with appropriate services for equitable educational opportunities.

The social determinants of juvenile justice and dual involvement have been characterized in recent years. They include minority status, gender, family functioning, mental illness, learning disabilities and SES. The intersectionality between historically oppressed identities, including race, gender, and mental health status appears to affect the probability of dual involvement and may have a mediating effect on the burden and depth of involvement. It is important to understand the nature of intersectionality and the ways in which it affects risk of harm so that systems can be better structured to address the needs of dually involved youth.

PART II. NEUROLOGICAL CORRELATES OF JUVENILE JUSTICE INVOLVEMENT

During adolescence—a period that begins as early as 8 years of age and concludes by age 24—significant developments in a young person’s physical and mental states occur, making it a particularly vulnerable period (McNeely & Blanchard, 2009). Aside from pubertal changes commonly associated with physical development during adolescence, cognitive and emotional changes are also notable during this period. Among the cognitive advancements are the abilities to think logically, plan for the future, and set
goals, which allows young people to develop maturity in decision making (McNeely & Blanchard, 2009). With regard to emotional development, youth begin to establish a self-identity, learn to manage emotions, relate to others with empathy, and resolve conflicts. But despite the maturity that emerges by the end of this period, adolescence can bring about challenges before adult skills are fully functioning, thus evoking the stereotypically moody, irresponsible, and irrational teenager.

Patterns of physical, cognitive, and emotional development vary widely among individuals. Gender and ethnic differences, for example, have been noted as complicating factors in understanding the range of manifestations of adolescent development (Gentry & Campbell, 2002). A guide by the American Psychological Association (APA) about adolescent healthcare noted that the differential socialization of male and female youth tends to promote the development of gender normative characteristics such as submissiveness and low self-esteem in females and aggression and anger in males (Gentry & Campbell, 2002). Moreover, ethnic differences affect adolescent development. Asian American families, for example, generally maintain collectivist rather than individual ideals and African American families value “spirituality, family, and respect” (Gentry & Campbell, 2002). Ethnic differences among races add more variation to developmental processes.

The APA has also written about the effect of learning disabilities on youth maturation and the potential misperception of behavior among youth with learning disabilities. Notably, hormonal changes during adolescence can “exacerbate learning disabilities” that may have been easy to compensate for early in schooling (Gentry &
Youth with learning problems can exhibit poorer cognitive abilities, including poor reasoning and verbal skills, than their peers, which are often interpreted as behavioral problems (Gentry & Campbell, 2002). Without proper school and disability services to accommodate these youth, they are at risk for negative outcomes such as violent behavior and suicidality.

The changes described above constitute physical and behavioral manifestations of physiological, biochemical, and neurological transformations that occur during adolescence. They have substantial social consequences and can play a role in determining a young person’s life trajectory. The following section will describe normal neurobiological changes that occur during adolescence. It will then discuss common mental illnesses among juvenile justice-involved youth and their neurological correlates, arguing that normal changes in the adolescent brain combined with mental illness make youth with mental health needs particularly vulnerable to encounters with the juvenile justice system due to the behavioral manifestations of these changes. This argument justifies the call for improved services to improve access to quality services that address the unique needs of court-involved youth with mental health challenges.

**Adolescent Neurological Development**

Substantial changes in brain structure and function occur during normal adolescence. A guide published by Johns Hopkins University (2009) outlines changes that occur during this period, highlighting alterations in the prefrontal cortex (PFC) and differential development of key areas governing risk/reward assessments as important to the understanding of adolescent behavior (McNeely & Blanchard, 2009). According to
researchers, two periods of synaptic pruning—stages during which non-essential connections in the brain’s grey matter are eliminated for increased signaling efficiency—happen over the developmental period. The first is around age 3 and the second occurs around the time of puberty, from about age 13 to age 18 (McNeely & Blanchard, 2009). During the second pruning phase, the PFC—the most anterior lobe of the brain—is one of the primary areas that undergoes the trimming process; it is important in executive functioning, which includes planning, reasoning, problem solving, and response inhibition (Fuster, 2008). However, the PFC is thought to be one of the last regions to mature, since pruning has been hypothesized to occur in a posterior to anterior direction (McNeely & Blanchard, 2009). After brain maturation is complete, which can occur as late as one’s mid-twenties, executive functions should be well controlled, though throughout adolescence, changes in this region can have wide-ranging behavioral manifestations (McNeely & Blanchard, 2009).

A paper by Luciana (2013) echoes the importance of the developing PFC, and elucidates the nuances of its functionality, noting that its ability to recruit and communicate with other cortical regions impacts executive functioning and decision-making. In particular, she recognizes that connections involving the PFC are integral to adolescent behavior. For example, the dorsolateral PFC forms connections with the “mediodorsal thalamus…the dorsal striatum (primarily the caudate nucleus)…[and] the inferior parietal cortex,” which are regions implicated in tasks related to working memory such as planning and executive control (Luciana, 2013). Decreases in gray matter and increases in white matter during development may streamline communication to improve
the management of stimuli, which require an integrated effort between these regions (Luciana, 2013; Harman, 2013). Furthermore, the ventromedial PFC is associated with the limbic system, including the amygdala, the hypothalamus, and the ventral striatum, which control “reward-based decision-making” and motivation (Luciana, 2013; Court, 2013). Luciana (2013) cites research findings suggesting that adolescents show increases in the ventral striatum above adult levels in response to the understanding of reward outcomes. They, in turn, show “blunted responses” in the amygdala, the orbitofrontal cortex, and the anterior cingulate in response to losses. These studies suggest that adolescents do not manage anticipation and planning events in the same way as adults and younger children—a finding that correlates with observed adolescent behavior.

Within the brain, different regions communicate through neuronal signals, which travel via chemical and electrical processes that allow impulses to travel from the axon of a neuron to its dendrites, which synapse with the dendrites of adjacent neurons to transmit information throughout the entirety of the brain (Purves et al., 2001). Covering sections of the neuronal axon, a fatty myelin sheath increases the conduction speed of electrical impulses. Without this sheath—observed as white matter in the brain—impulses are slower and communication is less efficient (Purves et al., 2001). According to Harman (2013), myelination has been associated with the “ability to plan ahead, weigh risks, and the making of complicated decisions.” Normal synaptic pruning during adolescence includes the proliferation of myelin through regions with which the PFC is associated (Luciana, 2013). Though there is some debate around the effect of myelination during adolescence, it has been suggested that the phenomenon may be
associated with increasing efficiency in decision-making and inhibitory control, which peaks at the onset of adulthood (Luciana, 2013). Thus, given the maturation processes that occur in young people, it may be possible that they are unable to make appropriate judgments in a timely manner. In combination with an underdeveloped PFC, these factors provide evidence of non-pathological immaturity in young people.

A final developmental process that is important to the understanding of normal adolescent behavior is the change in density and distribution of dopamine receptors in the brain. Dopamine is a neurotransmitter found in both the brain and the body. In the brain it influences executive functions, motivation, and reinforcement, among other processes. Harman (2013) and Court (2013) discuss the proliferation of receptors in limbic and prefrontal cortical structures, which impact emotion and executive function, respectively. The changes increase reward-seeking behavior and motivation, particularly since the PFC recruits these regions to play a role in determining the value of choices (Luciana, 2013). Luciana (2013) hypothesizes that increased dopamine response during adolescence triggers thrill-seeking and exploratory behaviors. This changing activity contributes to the noted patterns in adolescent behavior.

While this near-universal developmental process occurs in most adolescents, a wide range of normal behavioral correlates can manifest in traditionally positive or negative ways. The APA notes that “no adolescent can be fully understood outside the context of his or her family, neighborhood school, workplace, or community” and that factors such as gender, race, and sexual orientation may moderate developmental changes (Gentry & Campbell, 2002). Houston, Herting and Sowell (2013) write about differential
brain development that occurs in adolescents with differing traits. For example, the volume of the caudate nucleus in girls peaks, on average 3.5 years earlier than in boys; adolescent boys have larger amygdalae than their female counterparts. Moreover, youth demonstrating advanced phonological skills showed earlier thickening of the frontal gyrus, while those with greater motor ability had thinning in the left motor cortex (Houston, Herting, & Sowell, 2013). Certainly, this is just a small sampling of the myriad changes that occur during adolescence; one young person’s developmental trajectory is likely to differ from another’s, though it is important to understand the range of normal phenotypes among adolescents in order to provide them appropriate health, educational, and social services.

**Neurological Correlates of Common Mental Illnesses in Adolescents**

The preceding pages have outlined important changes in the adolescent brain during puberty. Importantly, there is vast variation in the range of normal development and behavior during this period; however, the presence of mental illness modifies developmental trajectories and outward expression of adolescence. These disorders alter patterns in cortical volumes, pruning, and neurotransmitter release and can be problematic for youth, especially those without adequate social support and medical services. They can put youth at risk for behaviors associated with juvenile justice involvement.

Conduct disorder (CD), oppositional defiant disorder (ODD), and attention deficit hyperactivity disorder (ADHD), and depression have been noted as the most prevalent mental illnesses among the juvenile justice population (Shufelt & Cocozza, 2006). In a
sample of court-involved youth and their parents, Burke, Mulvey & Schubert (2015) found that almost 75% of youth in the sample met criteria for at least one of these disorders. Finally, within the BHJJ population, study sites reported females as being most frequently diagnosed with ODD (41.3%), ADHD (26.5%), and depressive disorders (23%). Among male participants, the most common diagnoses were ADHD (42.5%), ODD (38.9%), and CD (21.2%) (BHJJ, 2014). These prevalence rates are much lower than those reported for the youth population ages 3-17 nationally (Centers for Disease Control and Prevention, n.d.).

Individuals with CD, ODD, or ADHD, often defy accepted behavioral norms. According to the Diagnostic and Statistical Manual 5th ed. (2015), ODD is defined as “a pattern of angry/irritable mood, argumentative/defiant behavior, or vindictiveness” (See Appendix 1). It includes the active defiance of rules and loss of temper. CD is described as persistent violation of “basic rights of others” and “age-appropriate societal norm or rules,” including bullying, fighting, and destruction of property (American Psychiatric Association, 2013; also see Appendix 2). These disorders are often considered in cases of self-control problems or difficulties in emotion regulation. Classified as a neurodevelopmental disorder, ADHD is diagnosed in individuals who have “a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with function or development” (American Psychiatric Association, 2013; also see Appendix 3). Often, individuals with ADHD will exhibit difficulty in follow-through, organization, and staying seated. They also commonly lose things and fidget with hands or feet (American Psychiatric Association, 2013).
Co-morbid diagnoses are also common among this population (Shufelt & Cocozza, 2006). In their meta-analysis of court-involved youth, Burke, Mulvey and Schubert (2015) found that half of youth who met criteria for one mental illness met criteria for at least one other. ODD and CD were noted as the most common diagnoses associated with comorbid disorders and youth also presented with a high prevalence of substance-related comorbidities. Data from BHJJ indicates that male and female youth enrolled in the program had an average of 2.31 diagnoses per person (Kretschmar, Butcher, & Flannery, 2014). While a serious multiplicity of mental illness diagnoses exists among this population, research indicates an underutilization of mental health services, pointing to a need for improvements in diagnostic capability and treatment.

Aside from problems with diagnosis and management, these disorders alone can have a tremendous impact on the likelihood that an adolescent will encounter the juvenile justice system. They predispose youth to behaviors that are more impulsive, risky, and socially unacceptable than their peers without mental illness. Moreover, these youth may exhibit behaviors common among individuals entering the school-to-prison pipeline, such as “disrupting school,” and “being beyond the control of schools,” as previously noted (Wald & Losen, 2003). Thus, they may be more prone overall to entering the justice system where they will likely receive few services.

**Conduct Disorder and Oppositional Defiant Disorder**

Scientists attempting to isolate structural abnormalities associated with CD and ODD (also called disruptive behavioral disorders) have found differences in key areas that could contribute to characteristic behaviors among adolescents with these mental
illnesses (Hyatt, Haney-Caron, & Stevens, 2012; Wallace et al., 2014; Fairchild et al., 2011; Sarkar et al., 2014). Research points to important structural changes that may cause youth with these diagnoses to behave in socially inappropriate and unacceptable ways and thus lead them toward juvenile justice involvement.

According to Matthys, Vanderschuren and Schutter (2013), research of ODD and CD have considered the two diagnoses as similar disorders, with ODD being a potentially milder form of CD. Noting this historical trend, CD and ODD will be considered jointly here due to the nature of neurobiological research of disruptive behavior disorders to this point. Broadly, the amygdala and the PFC, as well as temporal and parietal regions have been shown to exhibit the most convincing evidence of structural and functional deficits. A study by Fairchild et al. (2011) of male adolescents with CD found that compared to healthy controls, youth with CD had reduced gray matter volume in the amygdala as well as in adjacent structures. The amygdala is important in the integration of sensory information and emotional learning, including fear and pleasure responses. Its neighbor, the insula is also involved in emotional regulation and provides input to the amygdala to assist in its function (Kringelbach, 2013). Wallace et al. (2014) echoes findings related to the amygdala, adding that structures within the basal ganglia—a spiraling body that leads to the amygdala—exhibit reductions in volume. While the basal ganglia is known to play a prominent role in motor control, it is also important in affect regulation and cognitive functions such as learning and memory (Knierim, n.d.; Kringelbach, 2013).

At the cortical level, changes in the prefrontal, temporal, and parietal regions have been shown to have structural deficits, though findings are not as robust as those for...
subcortical areas. Matthys, Vanderschure and Schutter (2013) report finding under
activation in prefrontal regions during reward-related tasks as well as reductions in
prefrontal volumes. Wallace et al. (2014) report that in their adolescent sample, youth
with CD had decreased parietal and temporal cortical thickness as well as thinning of the
posterior cingulate cortex, which is part of the stimulus-processing limbic system (see
also: Sarkar et al., 2012). Their study revealed no differences in cortical surface area in
any region. Hayatt et al. (2012) likewise found thinning of temporal and parietal regions.
Deficits in folding or gyrification—a phenomenon, which increases surface area and has
been linked to more connections and greater cognitive abilities—were also reported in
their study. Prefrontal regions were most prominently described as exhibiting reduced
folding.

As association cortices, the parietal and temporal lobes are responsible for
processing sensory input and developing cognitive correlates for that input (Dragoi, n.d.;
Wright, n.d.). The temporal cortex integrates sensory information, emotions, and
behaviors while the parietal cortex integrates somatosensory, visual, and auditory
information and plays a key role in proprioception (Dragoi, n.d.; Wright, n.d). Notably,
lesions in these areas have been associated with emotional and behavioral problems, as
well as disruptions in recognizing sensory stimuli (Wright, n.d). While it is impossible to
make causal claims regarding an individual’s neurobiology and consequent behavior,
research regarding deficits in these regions suggests general behavioral patterns.

Deviations from normal functionality, as measured in studies examining white
matter in cerebral regions are also important in understanding the behaviors of youth with
disruptive behavioral disorders. As previously noted, white matter, or myelin is a marker of efficient communication between neurons. Fractional anisotropy (FA) studies, which measure the integrity of white matter microstructures in the brain, are used to understand possible disruptions in communication (Sarkar et al., 2012). FA abnormalities are used as a marker of impaired communication in the brain. Using FA, Sarkar et al. (2012) found that in a study of male youth ages 12-19, those with CD showed increased FA in the uncinate faciculus, a band, which connects the amygdala with prefrontal brain regions (Von Der Heide, Skipper, Klobusicky, & Olson, 2013). This could be a marker of pathology, perhaps overstimulation, though more research on the white matter structures in youth with disruptive behavioral disorders should be conducted.

**Attention Deficit Hyperactivity Disorder**

Neurological deviations found in youth with pure ADHD appear to be different than those described among youth with disruptive behavior disorders. Understanding abnormalities related to ADHD is important, as it is also frequently diagnosed among dually involved youth. In youth with ADHD, deficits have been found in the PFC and in structures of the basal ganglia. Inappropriate activation of the Default Mode Network (DMN) has also been noted as an abnormal functional finding in youth diagnosed with this disorder; other connectivity issues have additionally been described.

Greven et al. (2015) and He et al. (2015) have revealed findings related to brain structure, suggesting a reduction in brain volume among youth with ADHD. Greven et al. (2015) assert that overall gray matter volume was reduced by 3% in a sample of male youth participating in NeuroIMAGE, a large neuroimaging study of ADHD. Dividing the
group into age-defined brackets revealed smaller volumes in structures of the basal ganglia for younger boys with ADHD and larger volumes in the same structures for older boys with ADHD as compared with healthy controls. No overall white matter volume reductions were noted. In their study of boys age 7-16, He et al. (2015) found that while youth with ADHD did not show gray matter volume reduction overall, they did appear to have reductions in prefrontal regions as well as in the cingulate cortex, which is part of the limbic system. Volume reductions correlated with decreased performance on neurological tests of frontal lobe function and reaction time. A review of the literature by Ma, Duijvenvoorde and Scheres (2016) also highlighted volume reductions in the cingulate cortex. These authors have described their findings as relating to differential developmental trajectories in youth with ADHD, which is exemplified by the age-by-volume interaction in the basal ganglia (Greven et al., 2015). Normal proliferation and pruning may be delayed or altered in this population.

In studies of neurological functionality in youth with ADHD, deficits in white matter microstructures and neurological connectivity have been described (Van Ewijk et al., 2012; Silk et al., 2015). Van Ewijk et al., (2012) reviewed the literature on white matter microstructure abnormalities in ADHD, with little consensus on findings; however Witt and Stevens (2015) write that the most commonly reported deficits have been found in the cerebral peduncle of the midbrain, the corpus callosum—the body that joins the right and left hemispheres of the brain—and in the internal capsule of each hemisphere, which carry information to the basal ganglia and the thalamus, among other regions. The thalamus is associated with functionality in the limbic system and in the basal ganglia
(Swenson, 2006). In a study of white matter microstructure in youth ages 12-18 with ADHD, Witt and Stevens (2015) found reduced FA in 13 tracts—identified as areas of interest based on the literature of youth with ADHD. In the hyperactive subtype they additionally found increased radial diffusivity in these tracts, which is another indicator of white matter microstructure abnormalities. These studies reveal preliminary findings on diffuse white matter abnormalities in youth with ADHD. Notably, white matter is involved with signaling in the brain and some of these regions play a role in transmitting information to areas associated with processing and emotion regulation.

During task performance and at resting state, researchers have discovered abnormalities in neural connectivity in youth with ADHD, even in the absence of structural deviations. Studies suggest that aberrant brain activity in youth with ADHD often occurs in prefrontal regions, the cingulate cortex, and the basal ganglia, as well as motor areas during response inhibition and attention tasks (Cortese et al., 2012; Cubillo et al., 2010). In resting state studies, neurological connectivity in youth with ADHD diverged from that found among healthy controls (Oldehinkel, Francx, Beckmann, Buitelaar & Mennes, 2013; van Rooij et al., 2015). While these authors found decreases in connectivity, Von Rhein et al. (2016) found significantly increased connectivity within the basal ganglia. Though this suggests that there may not be uniformity in observed abnormalities, it points to widespread deficits in key areas for decision-making, stimuli integration, and emotion regulation; these may not be the same for each individual. The differences highlight the spectrum of adolescent development, which could correlate with behavioral differences, even among individuals diagnosed with the same mental illness.
Another neurological deficit found among youth with ADHD symptoms is the inappropriate activation of the Default Mode Network (DMN)—a neural network that “is active during resting state and deactivates during engagement in a cognitive task” (Ma, Duijvenvoorde, & Scheres, 2016; see also: Liddle et al., 2011; Cortese et al., 2012). The counterpart of the DMN is the ventral attention network, which is an area normally active during cognitive tasks. Studies have indicated that greater levels of cognitive stimulation are required to deactivate the DMN and activate the ventral attention network in youth with ADHD as compared with healthy controls (Cortese et al., 2012). In a study using a NeuroIMAGE cohort, youth performed a stop signal test in which they were required to respond to “stop” and “go” signals to measure response inhibition during fMRI testing (van Rooij et al. 2015). While youth in the control group exhibited connectivity in ventral attention regions during the task, including the basal ganglia and the superior frontal gyrus, youth with ADHD showed stronger connectivity with DMN-associated areas, such as the inferior frontal gyrus and the temporal lobe. Gyri are ridges or lips on the cortex of the brain. The authors’ results indicate that impaired connectivity in individuals with ADHD make it challenging for them to suppress “irrelevant networks such as the DMN” during cognitive tasks, something that has been shown as a requirement for successful performance (Spreng, Stevens, Chamberlain, Gilmore, & Schacter, 2010; Gao & Lin, 2012).

Finally, evidence suggests that variations in dopaminergic genes, DAT1 and DRD4 play a role in signaling related to reward and reinforcement (Ma, Duijvenvoorde, & Scheres, 2016; Fernandez-Jaen et al., 2015). DRD4 is a dopamine receptor gene, which
allows dopamine signaling to occur in neurons (Lusher, Chandler, & Ball, 2001). The DAT1 gene is thought to regulate the concentration of dopaminergic synapses as well the duration of dopamine activity in these synapses (Fernandez-Jaen et al., 2015). An allele variation with 10 base-pair repeats has been linked to youth ADHD, which causes there to be an increase above normal levels of the dopamine transporter protein—a protein that removes dopamine from neuron synapses—thus leaving less available dopamine in the synaptic cleft (Fernandez-Jaen et al., 2015). DAT1 is particularly active in the PFC. Examining structural correlates of the 10 repeat allele, a study of youth ages 6-18 found that youth with the allele who had ADHD had significantly reduced thickness of the prefrontal cortex relative to those without the allele, suggesting an etiology for impaired executive functioning in youth with ADHD (Fernandez-Jaen et al., 2015).

Given these data, it appears that youth with ADHD exhibit structural and functional deficits in their brains, which could contribute to ADHD symptomology. Like the changes reported in youth with CD/ODD, neurological changes in young people with ADHD could further predispose them to behaviors that prime them for involvement in the juvenile court system.

**Comorbid CD/ODD and ADHD**

As described in studies assessing mental illness among juvenile justice populations, CD/ODD and ADHD are often diagnosed together. In fact, in many studies assessing the neurological correlates of each diagnosis, samples of youth with pure ADHD or pure CD/ODD were not used. While this is a potential limitation of analysis
concerning pure diagnoses, it is worthwhile to consider the neurobiological correlates of the comorbid diagnoses, given its prevalence among the juvenile justice population.

The literature describes both structural and functional changes that occur in youth with comorbid CD/ODD and ADHD. Structural changes have notably been observed in the basal ganglia as well as in limbic structures (Sterzer, Stadler, Poustka, & Kleinschmidt, 2007). Matthys, Vanderschuren and Schutter (2012) found that these structures, as well as the amygdala, temporal cortex, and prefrontal cortex had reduced volume in youth with both diagnoses. Sasayama et al. (2010) studied children ages 6-12 with comorbid CD/ODD and ADHD as well as pure ADHD. They found that comorbid CD/ODD and ADHD was related to extensive gray matter reductions in cortical and subcortical regions. While the ADHD cohort demonstrated reductions in the temporal lobe, occipital lobe and amygdala, those with comorbid diagnoses showed additional reductions in the temporal sulcus of the temporal lobe and middle frontal gyrus of the frontal lobe (Sasayama et al. 2010). These results indicate additional abnormalities that may correlate with more severe symptomology.

Functional changes have also been observed in youth with comorbid CD/ODD and ADHD. Van Ewijk et al. (2015) studied youth from the NeuroIMAGE cohort with pure ADHD and comorbid CD/ODD and ADHD. They found decreased FA, most notably in the white matter of fronto-occipital fasciculus, which connects the frontal and occipital lobes, in the uncinate fasiculus of the basal ganglia, and in the corpus callosum, as compared with youth with pure ADHD. Again this study suggests more extensive impairment in youth with both diagnoses.
It is important to consider the pathology of comorbid CD/ODD and ADHD among dually involved youth due to the prevalence of these diagnoses in this population. Further research would help in distinguishing individuals with single diagnoses to those with comorbid diagnoses, as well as in elucidating the burden of comorbid mental illness among youth the juvenile justice population.

**Depression**

While disruptive behavior disorders and ADHD were the most commonly reported diagnoses among dually involved youth, depression was also frequently observed among the population. It is likely a substantial contributor to the burden of juvenile justice involvement among youth with mental illness. Though few studies examine the structural and functional deficits in youth with depression, important findings from the literature indicate that both abnormal thickening and thinning in prefrontal regions occur (Whittle et al. 2014). Moreover, Whittle et al. (2014) reported increased amygdala volume, increased size of the nucleus accumbens of the basal ganglia, and prefrontal thinning over the course of adolescence. Fonseka et al. (2016) reported thickening of the frontal gyrus.

Studies of functionality in youth with depression focus on over- and under-activation of brain regions involved in executive functioning, emotion regulation, processing, and attention. Miller, Hamilton, Sacchet, and Gotlib (2015) reviewed neuroimaging studies that showed altered functionality among youth with depression. Their main findings revealed that depressed youth showed overall hyperactivity of the prefrontal cortex, the insula, the cingulate cortex, the thalamus and the temporal cortex.
Hypoactivity was observed in the caudate of the basal ganglia. In another study, Hall et al. (2014) demonstrated reduced amygdala activity in these youth. Moreover, during tasks related to executive functioning, depressed youth exhibited hypoactivation of the cingulate cortex and the insula. Finally, during emotion processing and affective tasks, Ho et al. (2015) found that adolescents with depression showed “inflexible” activation of the DMN, whereas healthy controls show reduced activation. These studies show alteration in brain structure and function among youth with depression, which could play an important role in the behavior of dually involved youth.

* A look at Justice-Involved Youth

Among justice-involved youth, studies have found neurobiological changes that resemble what has been described in youth diagnosed with CD/ODD and ADHD, lending evidence to the idea that this population suffers from mental illnesses, and that structural abnormalities predispose them to encounters with the juvenile justice system. A study of incarcerated males in a high-security prison, assessed aberrations in functional connectivity related to impulsivity (Shannon et al., 2011). In impulsive juveniles, the authors found that activity in motor planning regions were correlated with regions in the DMN. These are the same regions that are overactive in youth with ADHD. An additional study revealed that among a sample of adolescent males who had committed crimes, juvenile offenders had impaired activity in regions involved in emotion processing, including the amygdala, the insula, and the cingulate cortex, when shown unpleasant images (Pincham, Bryce, & Pasco Fearon, 2015). The findings suggest that these youth have reduced emotional responsiveness and impairments similar to those found in youth
with CD/ODD and in those with depression. In fact, they may have undiagnosed mental illnesses that remain untreated.

One study assessing structural abnormalities in delinquent youth looked at gray matter reductions in homicidal youth (Cope et al., 2014). The authors found that homicidal youth had smaller total brain volumes as well as specific gray matter reductions in the temporal lobe, including in the insula and the temporal gyri (Cope et al., 2014). While the study on homicidal youth examines extreme cases that are perhaps not typical of youth offenders overall, it provides a starting point for further studies of its nature, including those involving youth who have committed less serious offenses. Moreover, studies of incarcerated adults have shown structural changes in the prefrontal and temporal cortices as well as in limbic areas, which also suggest directions for research on youth (Yang & Raine, 2009; Dolan, Deakin, Roberts, Anderson, 2002; Cope et al., 2014).

**Limitations**

While these studies show evidence of common neurological disruptions in youth with mental illness involved in the juvenile justice system, they have limitations, which prevent a comprehensive understanding of this population and their needs. A major barrier is that the majority of study samples include only male subjects or very few female participants. This is particularly problematic considering that 28% of delinquency cases in 2013 involved female adolescents. In fact, the growth in female delinquency caseload “outpaced that for males for all offense categories between 1985 and 2013” (Hockenberry & Puzzanchera, 2015). Though a preliminary study on structural
abnormalities in female adolescents with CD revealed a strong overlap with studies considering only male populations, more research is required for a thorough understanding of this underrepresented population (Fairchild et al., 2013). An additional limitation of the research is that it often focuses on incarcerated youth and do not involve status offenders or youth who are not incarcerated, but have nevertheless encountered the juvenile justice system. As such, an understanding of the diversity of youth involved in the juvenile justice system—who still have substantial mental health needs—remains unexplored. Research on these youth would contribute immensely to the existing body of knowledge.

Finally, in understanding court-involved youth, it is important to consider normal developmental trajectories that occur among adolescents. The literature indicates that young people experience vast neurological changes during adolescence. Some of the transformations that occur during this period resemble those that are observed in individuals with certain mental illnesses, making adolescence a particularly vulnerable period. It is possible that youth in the juvenile justice system, including those with diagnosed mental illnesses are experiencing normal developmental changes, though development may be delayed or atypical. Shannon et al. (2011) report that younger subjects in their study of juvenile offenders exhibited neurological connectivity similar to impulsive incarcerated youth. The authors concluded, “impulsivity in the offender population is a consequence of a delay in typical development rather than a distinct abnormality” (Shannon et al., 2011). Moreover, Francx et al. (2015) found behavioral improvements, which correlated with functional neurological improvements, in a
longitudinal study of youth with ADHD. These results indicate that with age, maturity, and appropriate services, youth who might otherwise be resigned to the cycle of justice system involvement can, in fact, make behavioral improvements. Thus, the argument remains the same: youth require comprehensive health care, education, and social services to aid them through what might be a challenging period. Special attention should be given to adolescents with mental health needs, as their mental illnesses can cause neurobiological changes or developmental delays that have behavioral manifestations, which make them prone to juvenile justice involvement.

**PART III. THE JUVENILE MENTAL HEALTH ADVOCACY PROJECT**

The preceding sections have assessed the social determinants and neurological correlates of involvement in both the juvenile justice and mental health systems among adolescents. The evidence presents a need for comprehensive services for at-risk youth, particularly programs that address the social, mental health, and educational needs of this population; however, the availability of programs that understand dual involvement in a holistic manner is limited.

BHJJ and Reclaiming Futures have previously been described as programs that appear to effectively meet the needs of multisystem youth. In February 2015, a new Massachusetts-based program—the Juvenile Mental Health Advocacy Project (J-MHAP)—began piloting a model similar to these existing programs in two juvenile courts in Essex and Middlesex counties in Massachusetts. The program’s concept uses
principles like those exemplified by BHJJ and Reclaiming Futures in that it understands the importance of mental health treatment, as well as social services, educational services, and family involvement in the well-being of young people. This section will describe the program model and highlight preliminary findings on its effectiveness.

_Juvenile Mental Health Advocacy Project Model_

The J-MHAP model uses lawyers with previous advocacy experience who serve as MHAs who interface with youth, their families, court personnel, and individuals from other domains, including education, healthcare, and social services. The MHAs carry out the objectives of J-MHAP, working with multiple systems to meet the needs of court-involved youth (Health Law Advocates, 2014). When a young person encounters the juvenile court system, a court judge—often in conjunction with a mental health evaluation conducted in the court clinic—appoints the youth a MHA. Often, probation officers recommend the appointment of a MHA, though other individuals, such as attorneys, parents, and school officials can also make recommendations (Health Law Advocates, 2014). Youth enrolled in J-MHAP are most commonly before the court on a Child Requiring Assistance (CRA) case, which encompasses runaways, youth who habitually fail to obey the law and/or parental guidance, habitual truants, or habitual school offenders (Health Law Advocates, 2015; Juvenile Justice Geography, Policy, Practice & Statistics, n.d). Parents, legal guardians, custodians, and school officials can file a CRA. On appointment, the court judge defines case scopes, which identify the areas the judge believes the MHA should focus on in her work. Case scopes include beginning
educational services, coordinating mental health services, and securing Department of Youth Services (Feinberg & Elliott, 2016).

Once appointed, the MHA makes contact with the youth, his/her family, and his/her attorney. The MHA assesses needs of the youth with the help of these parties and subsequently defines case goals, which are more specific than the scopes. For example, goals are made around coordinating care and obtaining appropriate school placement (Health Law Advocates, 2015). During the 6-month duration of a given youth’s enrollment in the program, the MHA works with relevant people and agencies to serve the best interest of the adolescent. Importantly, the MHA’s work consists of advocacy efforts aimed at coordinating care across multiple systems. The MHAs attend education team meetings to advocate for eligibility for services, they advocate with the Department of Children and Families for the most salient placement option, and they advocate against juvenile detention, among a myriad other activities (Health Law Advocates, 2014). At the end of the 6-month standard appointment, the MHA can choose to extend the case by 3 months if she believes it to be in the best interest of the youth (Health Law Advocates, 2014). This model demonstrates that the work of the MHA cuts across systems, integrating care from different areas to meet the complex needs of this dually involved population. Their activities serve to meet the goal of improving the behavioral health of justice-involved youth and take a holistic approach to achieving that goal.

Preliminary Evaluation Findings

Evidence from a preliminary evaluation of J-MHAP suggest that the program has made strides in helping dually involved youth access healthcare and other services in its
initial phase, which spanned from February 2015 to December 2015. The most commonly defined case scopes for 82 youth who were enrolled in J-MHAP during this period were to begin or improve special education services (61%), followed by securing community-based mental health services (37%) and coordinating mental health services (33%) (Feinberg & Elliott, 2016). Working within these case scopes, the MHAs were found to be successful in achieving their established goals, with over 60% of goals in each category met. Goals in the categories of “complete assessment or evaluation for youth” (76.%) and “engagement in services” (73.5%) had the highest completion rates. Goals having to do with “school placement/issues” (70.7%), “access to services” (69.5%), and care coordination (69.4%) closely followed (Feinberg & Elliott, 2016). Goals involving “court/juvenile justice issues” (61.5%) had the lowest completion rate.

For youth whose appointments in JMHAP had ended, 81.4% of their established goals had been met. Notably, the MHAs spent the most time interfacing with the court, relative to other systems (Feinberg & Elliott, 2016). They spent almost one-third of their time in communication with “attorneys, probation officers, court clinicians, diversion program, clerks, as well as appearing in court” (Feinberg & Elliott, 2016). While outcome data is not available, the results indicate that the MHAs have successfully reached across different systems to coordinate necessary services for juvenile justice population from two Massachusetts juvenile courts. They have managed to achieve most of the goals they have set for these youth, which integrates a spectrum of needs.

The J-MHAP model, in which one individual coordinates services for youth, advocates for their needs, and tracks them over a period of time appears to be a positive
addition to the existing resources for youth involved in the juvenile justice system with mental health needs. While these evaluation results are preliminary, the MHAs seem to have been able work in a timely manner to accomplish stated goals for youth with complex needs. Their work across systems could potentially break down barriers to accessing care for this population and allow them resources from health, education and social services that can provide them with necessary support. Not only does this model have the potential to improve the behavioral health of individuals in the population, it can also improve their overall functioning and reduce the burden of their mental illness.

CONCLUSION

This thesis has outlined the risk factors for involvement in the juvenile court and mental health systems, highlighting a new program model that has the potential to improve access to health, educational, and social services for this population. In the first section, it describes the social determinants of involvement in both systems. Understanding dual involvement from a social lens, it argues that the intersectionality of identities involving historically oppressed groups creates a significant burden for youth with mental illness, pointing to factors that are important in identifying individuals who may be at risk for juvenile justice involvement. In the second section, it reviews the existing literature on structural and functional neurological deficits in youth with CD/ODD, ADHD, and depression. The findings suggest substantial deficits involving brain regions associated with executive functioning, emotion regulation, attention, and reinforcement. It argues that youth with these diagnoses—which are the most commonly
reported diagnoses among youth in the juvenile justice system—have neurological
deficits with behavioral correlates that predispose them to involvement in the juvenile
justice system. Finally in the third section, this thesis describes the J-MHAP program
model that works to coordinate and integrate multisystem services for court-involved
youth with complex mental health, social, and educational needs. This population
requires intensive services, as they have documented needs that span multiple systems,
which have not been historically integrated into a single care plan. Preliminary findings
from an evaluation of the program suggest program’s early success in improving access
to services for these high-need youth.

A comprehensive understanding of the needs of this population is important, as
the youth who comprise it are immensely affected by mental illness and juvenile justice
involvement. The social determinants along with the neurological characteristics of this
population support the creation of programs that specifically address the complex and
unique needs of these young people. Given the high rates of mental illness among justice-
involved youth, it appears that existing services do not adequately provide care to
individuals with dual involvement. There is room for improvement in the school system,
in mental healthcare, and in social services that can positively influence this population in
multiple domains by shifting the management of individuals with mental illness away
from a punishment oriented lens, to one that is focused on treatment and rehabilitation.

Thus, programs should aim to address the unique needs of youth with mental
illnesses. A multi-systemic approach to improving access to health, educational, and
social services could reduce the burden of mental illness among this population and
decrease barriers to accessing appropriate care. Moreover, these initiatives could reduce the prison population as well as the number of individuals involved in the justice system. While recidivism rates are not available for youth, recidivism in the national prison population is over 50% (Bureau of Justice Statistics, n.d.). In providing comprehensive services that encompass socioeconomic and mental health support, the justice system could become more just and offer opportunities for rehabilitation and re-entry and not solely institutionalization.

In light of recent events in the United States, notably those in Ferguson, MO and in Baltimore, MD, which have revealed racially discriminatory practices within the criminal justice system, a consideration of medical injustices is prudent. History has shown that individuals with mental illnesses have been mistreated by the healthcare system in ways that have shuffled them into institutions, effectively segregating them from individuals without mental illness. Despite efforts at deinstitutionalization, prisons became new warehouses for people requiring mental healthcare, as evidenced by the high rates of mental illness among incarcerated people in the United States. Particularly with the ‘war on drugs,’ rates of mental illness and substance use in the prison population have increased without proper resources to treat these individuals. Youth, as well as adults, have been affected by this discrimination and they are easily trapped in a system that cannot offer them the complex services they require. Thus, programs addressing multiple systems to meet the unique needs of dually involved youth could alter trends in mass incarceration and discriminatory practices within the justice system.
APPENDIX 1: DSM-V DIAGNOSTIC CRITERIA FOR OPPOSITIONAL DEFiant DISORDER

Diagnostic Criteria
313.81 (F91.3)

A. A pattern of angry/irritable mood, argumentative/defiant behavior, or vindictiveness lasting at least 6 months as evidenced by at least four symptoms from any of the following categories, and exhibited during interaction with at least one individual who is not a sibling.

- **Angry/Irritable Mood**
  1. Often loses temper.
  2. Is often touchy or easily annoyed.
  3. Is often angry and resentful.

- **Argumentative/Defiant Behavior**
  4. Often argues with authority figures or, for children and adolescents, with adults.
  5. Often actively defies or refuses to comply with requests from authority figures or with rules.
  6. Often deliberately annoys others.
  7. Often blames others for his or her mistakes or misbehavior.

- **Vindictiveness**
  8. Has been spiteful or vindictive at least twice within the past 6 months.
Note: The persistence and frequency of these behaviors should be used to distinguish a behavior that is within normal limits from a behavior that is symptomatic. For children younger than 5 years, the behavior should occur on most days for a period of at least 6 months unless otherwise noted (Criterion A8). For individuals 5 years or older, the behavior should occur at least once per week for at least 6 months, unless otherwise noted (Criterion A8). While these frequency criteria provide guidance on a minimal level of frequency to define symptoms, other factors should also be considered, such as whether the frequency and intensity of the behaviors are outside a range that is normative for the individual’s developmental level, gender, and culture.

B. The disturbance in behavior is associated with distress in the individual or others in his or her immediate social context (e.g., family, peer group, work colleagues), or it impacts negatively on social, educational, occupational, or other important areas of functioning.

C. The behaviors do not occur exclusively during the course of a psychotic, substance use, depressive, or bipolar disorder. Also, the criteria are not met for disruptive mood dysregulation disorder.

Specify current severity:

- **Mild**: Symptoms are confined to only one setting (e.g., at home, at school, at work, with peers).

- **Moderate**: Some symptoms are present in at least two settings.

- **Severe**: Some symptoms are present in three or more settings.
APPENDIX 2: DSM-V DIAGNOSTIC CRITERIA FOR CONDUCT DISORDER

Diagnostic Criteria

A. A repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate societal norms or rules are violated, as manifested by the presence of at least three of the following 15 criteria in the past 12 months from any of the categories below, with at least one criterion present in the past 6 months:

- **Aggression to People and Animals**
  1. Often bullies, threatens, or intimidates others.
  2. Often initiates physical fights.
  3. Has used a weapon that can cause serious physical harm to others (e.g., a bat, brick, broken bottle, knife, gun).
  4. Has been physically cruel to people.
  5. Has been physically cruel to animals.
  6. Has stolen while confronting a victim (e.g., mugging, purse snatching, extortion, armed robbery).
  7. Has forced someone into sexual activity.

- **Destruction of Property**
  8. Has deliberately engaged in fire setting with the intention of causing serious damage.
  9. Has deliberately destroyed others’ property (other than by fire setting).

- **Deceitfulness or Theft**
10. Has broken into someone else’s house, building, or car.

11. Often lies to obtain goods or favors or to avoid obligations (i.e., “cons” others).

12. Has stolen items of nontrivial value without confronting a victim (e.g., shoplifting, but without breaking and entering; forgery).

   o Serious Violations of Rules

13. Often stays out at night despite parental prohibitions, beginning before age 13 years.

14. Has run away from home overnight at least twice while living in the parental or parental surrogate home, or once without returning for a lengthy period.

15. Is often truant from school, beginning before age 13 years.

B. The disturbance in behavior causes clinically significant impairment in social, academic, or occupational functioning.

C. If the individual is age 18 years or older, criteria are not met for antisocial personality disorder.

*Specify* whether:

- **312.81 (F91.1) Childhood-onset type**: Individuals show at least one symptom characteristic of conduct disorder prior to age 10 years.

- **312.82 (F91.2) Adolescent-onset type**: Individuals show no symptom characteristic of conduct disorder prior to age 10 years.

- **312.89 (F91.9) Unspecified onset**: Criteria for a diagnosis of conduct disorder are met, but there is not enough information available to determine whether the onset of the first symptom was before or after age 10 years.
Specify if:

- **With limited prosocial emotions:** To qualify for this specifier, an individual must have displayed at least two of the following characteristics persistently over at least 12 months and in multiple relationships and settings. These characteristics reflect the individual’s typical pattern of interpersonal and emotional functioning over this period and not just occasional occurrences in some situations. Thus, to assess the criteria for the specifier, multiple information sources are necessary. In addition to the individual’s self-report, it is necessary to consider reports by others who have known the individual for extended periods of time (e.g., parents, teachers, co-workers, extended family members, peers).

  - **Lack of remorse or guilt:** Does not feel bad or guilty when he or she does something wrong (exclude remorse when expressed only when caught and/or facing punishment). The individual shows a general lack of concern about the negative consequences of his or her actions. For example, the individual is not remorseful after hurting someone or does not care about the consequences of breaking rules.

  - **Callous—lack of empathy:** Disregards and is unconcerned about the feelings of others. The individual is described as cold and uncaring. The person appears more concerned about the effects of his or her actions on himself or herself, rather than their effects on others, even when they result in substantial harm to others.

  - **Unconcerned about performance:** Does not show concern about poor/problematic performance at school, at work, or in other important activities. The individual does not put forth the effort necessary to perform well, even when expectations are clear, and typically blames others for his or her poor performance.

  - **Shallow or deficient affect:** Does not express feelings or show emotions to others, except in ways that seem shallow, insincere, or superficial (e.g., actions contradict the emotion displayed; can turn emotions “on” or “off” quickly) or
when emotional expressions are used for gain (e.g., emotions displayed to manipulate or intimidate others).

Specify current severity:

- **Mild:** Few if any conduct problems in excess of those required to make the diagnosis are present, and conduct problems cause relatively minor harm to others (e.g., lying, truancy, staying out after dark without permission, other rule breaking).

- **Moderate:** The number of conduct problems and the effect on others are intermediate between those specified in “mild” and those in “severe” (e.g., stealing without confronting a victim, vandalism).

- **Severe:** Many conduct problems in excess of those required to make the diagnosis are present, or conduct problems cause considerable harm to others (e.g., forced sex, physical cruelty, use of a weapon, stealing while confronting a victim, breaking and entering).
APPENDIX 3: DSM-V DIAGNOSTIC CRITERIA FOR ATTENTION DEFICIT HYPERACTIVITY DISORDER

Diagnostic Criteria

A. A persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development, as characterized by (1) and/or (2):

1. Inattention: Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities:

   - Note: The symptoms are not solely a manifestation of oppositional behavior, defiance, hostility, or failure to understand tasks or instructions. For older adolescents and adults (age 17 and older), at least five symptoms are required.

   a. Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or during other activities (e.g., overlooks or misses details, work is inaccurate).

   b. Often has difficulty sustaining attention in tasks or play activities (e.g., has difficulty remaining focused during lectures, conversations, or lengthy reading).

   c. Often does not seem to listen when spoken to directly (e.g., mind seems elsewhere, even in the absence of any obvious distraction).

   d. Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., starts tasks but quickly loses focus and is easily sidetracked).
e. Often has difficulty organizing tasks and activities (e.g.,
difficulty managing sequential tasks; difficulty keeping
materials and belongings in order; messy, disorganized work;
has poor time management; fails to meet deadlines).

f. Often avoids, dislikes, or is reluctant to engage in tasks that
require sustained mental effort (e.g., schoolwork or
homework; for older adolescents and adults, preparing reports,
completing forms, reviewing lengthy papers).

g. Often loses things necessary for tasks or activities (e.g., school
materials, pencils, books, tools, wallets, keys, paperwork,
eyeglasses, mobile telephones).

h. Is often easily distracted by extraneous stimuli (for older
adolescents and adults, may include unrelated thoughts).

i. Is often forgetful in daily activities (e.g., doing chores,
running errands; for older adolescents and adults, returning
calls, paying bills, keeping appointments).

2. Hyperactivity and impulsivity: Six (or more) of the following
symptoms have persisted for at least 6 months to a degree that is
inconsistent with developmental level and that negatively impacts
directly on social and academic/occupational activities:

- **Note:** The symptoms are not solely a manifestation of oppositional
behavior, defiance, hostility, or a failure to understand tasks or
instructions. For older adolescents and adults (age 17 and older), at
least five symptoms are required.

a. Often fidgets with or taps hands or feet or squirms in seat.

b. Often leaves seat in situations when remaining seated is
expected (e.g., leaves his or her place in the classroom, in the
office or other workplace, or in other situations that require remaining in place).

c. Often runs about or climbs in situations where it is inappropriate. (**Note:** In adolescents or adults, may be limited to feeling restless.)

d. Often unable to play or engage in leisure activities quietly.

e. Is often “on the go,” acting as if “driven by a motor” (e.g., is unable to be or uncomfortable being still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with).

f. Often talks excessively.

g. Often blurts out an answer before a question has been completed (e.g., completes people’s sentences; cannot wait for turn in conversation).

h. Often has difficulty waiting his or her turn (e.g., while waiting in line).

i. Often interrupts or intrudes on others (e.g., butts into conversations, games, or activities; may start using other people’s things without asking or receiving permission; for adolescents and adults, may intrude into or take over what others are doing).

B. Several inattentive or hyperactive-impulsive symptoms were present prior to age 12 years.

C. Several inattentive or hyperactive-impulsive symptoms are present in two or more settings (e.g., at home, school, or work; with friends or relatives; in other activities).
D. There is clear evidence that the symptoms interfere with, or reduce the quality of, social, academic, or occupational functioning.

E. The symptoms do not occur exclusively during the course of schizophrenia or another psychotic disorder and are not better explained by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, personality disorder, substance intoxication or withdrawal).

Specify whether:

- **314.01 (F90.2) Combined presentation**: If both Criterion A1 (inattention) and Criterion A2 (hyperactivity-impulsivity) are met for the past 6 months.

- **314.00 (F90.0) Predominantly inattentive presentation**: If Criterion A1 (inattention) is met but Criterion A2 (hyperactivity-impulsivity) is not met for the past 6 months.

- **314.01 (F90.1) Predominantly hyperactive/impulsive presentation**: If Criterion A2 (hyperactivity-impulsivity) is met and Criterion A1 (inattention) is not met for the past 6 months.

Specify if:

- **In partial remission**: When full criteria were previously met, fewer than the full criteria have been met for the past 6 months, and the symptoms still result in impairment in social, academic, or occupational functioning.

Specify current severity:

- **Mild**: Few, if any, symptoms in excess of those required to make the diagnosis are present, and symptoms result in no more than minor impairments in social or occupational functioning.

- **Moderate**: Symptoms or functional impairment between “mild” and “severe” are present.
• **Severe:** Many symptoms in excess of those required to make the diagnosis, or several symptoms that are particularly severe, are present, or the symptoms result in marked impairment in social or occupational functioning.
REFERENCES


Butts, Jeffrey A., John K. Roman, and Elissa Gitlow (Editors). Organizing for Outcomes: Measuring the Effects of Reclaiming Futures in Four Communities. A Reclaiming


http://doi.org/10.1176/appi.ps.201100113


http://doi.org/10.1177/1049731503253364


http://doi.org/10.1007/s10964-006-9053-6


http://doi.org/10.1136/bmj.326.7398.1064


National Center for Juvenile Justice (NCJJ), with funding from the John D. and Catherine T. MacArthur Foundation.


Lusher, J ., Chandler, C., & Ball, D. (2001). Dopamine D4 receptor gene (DRD4) is associated with Novelty Seeking (NS) and substance abuse: the saga continues . . . ,
http://doi.org/10.1207/S15326918CS0402_2


http://doi.org/10.1017/S0954579412000272

http://doi.org/10.1186/1752-4458-7-18


CURRICULUM VITAE

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Education

Graduate:
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M.S. Medical Sciences & MPH, concentration in Social and Behavioral Sciences

Undergraduate:
Harvard College, Cambridge, MA
September 2010 – May 2014
B.A. History of Science, focus in Mind, Brain, and Behavior.

Research Experience
Graduate Research Assistant, Department of Community Health Sciences
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Laboratory Intern, Department of Developmental and Reproductive Toxicology
Pfizer, Inc., New London, CT
June 2009-August 2010

Teaching Experience
Teaching Assistant, First Aid Certification Course, Harvard Medical School
April 2014

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February 2013-May 2014

Presentations
Couce, John-Paul and Nguyen, Eliza M. “Death By Oxygen: the Oxygen Paradox” 21st

Invited to speak on a panel sponsored by the Harvard Faculty of Arts and Sciences Office of Diversity Relations, “American Masala: Race Mixing, the Spice of Life or Watering Down Cultures?” 10 October 2012.

Employment History

**EMT-Basic**

*Brewster Ambulance*, Boston, MA

*June 2013-August 2013*

**Laboratory Intern**

*Pfizer, Inc.*, New London, CT

*June 2009-August 2010*

**Coach, Tiger Kixx Program (ages 3-5) & Under-9 Age Group**

*Everson Soccer Academy*, New Haven, CT

*Summers, 2006-2009*

Activities

**Harvard CrimsonEMS**

Chief, Spring 2013-Fall 2013
First Rider, Fall 2013-present
Communications Officer, Spring 2012-Fall 2012
Founding Member, Spring 2012

**Tree of Life Educational Fund 501(c)(3)**

Member of the Board of Directors, Fall 2011-present

**The Harvard Crimson**

Senior Beat Reporter, House and Student Life, Spring 2012
Beat Reporter, Gender/Sexuality, Fall 2011
Reporter, Spring 2011

**Harvard College Palestine Solidarity Committee**

Executive Board, Fall 2011-Fall 2013

**Harvard Half Asian People’s Association (HAPA)**

President, Spring 2012-Fall 2012
Social Chair, Spring 2011-Fall 2011
Freshman Representative, Fall 2010
Responsible Investment at Harvard Coalition
Campus Coordinator, Spring 2012-Fall 2012

Harvard Undergraduate Global Health Forum
Executive Board, Fall 2010-Fall 2011

Delta Gamma Fraternity, Zeta Phi Chapter
Member, 2011-2014