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Assessing the relationship between treatment quality, matching and dosage and juvenile justice outcomes among youth with co-occurring substance abuse and mental health disorders

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Introduction

Nearly 730,000 arrests of persons under the age of 18 occurred in the United States in 2018 (Puzzanchera, 2020), with approximately 744,500 cases processed through juvenile courts (Hockenberry & Puzzanchera, 2020). It is well established that upwards of 75% of youth in the juvenile justice system suffer from at least one mental health disorder (e.g., Brosnard et al., 2016; Hovey et al., 2017; Teplin et al., 2002; Wasserman et al., 2002). Further, nearly 61% of system-involved youth have been diagnosed with co-occurring mental health and substance use disorders (Shufelt & Cocozza, 2006; see also Teplin et al., 2002; Wasserman et al., 2002). Critically, research demonstrates that juveniles in out-of-home placements, such as secure detention and residential facilities, suffer a higher prevalence of co-occurring disorders (e.g., Abram et al., 2003), represent the youth with the most serious and/or extensive criminal offending histories and the highest risk for reoffending (e.g., Baglivio, Jackowski, Greenwald, & Howell, 2014). Notably, nearly 25,000 youth are held daily in juvenile justice residential facilities across the U.S. (OJJDP, 2023). As such, effective treatment and (re)habilitative services for youth with co-occurring mental health and substance use disorders placed in juvenile justice residential facilities is paramount if we are to effect positive change among the highest-risk youth in the system's care as well as promote public safety.

Juvenile justice reform and current best practice via the prolific Risk-Need-Responsivity (RNR) model posits focusing on the highest-risk youth, matching services to dynamic risk factors that have a demonstrated association with reoffending (criminogenic needs, identified through valid assessment), and that services are delivered using predominately cognitive and behavioral treatment approaches (general responsivity) as well as individualized to relevant characteristics (specific responsivity; Andrews & Bonta, 2003, 2010). Additionally, treatment and intervention services should be delivered with sufficient integrity and fidelity as well as provided at sufficient dosages in order to evidence the recidivism reductions demonstrated in model evaluation studies (Lipsey,

2009). The Standardized Program Evaluation Protocol (SPEP) developed by Mark Lipsey represents the strongest empirically based approach to providing (and evaluating) both treatment quality and adequate dosage specific to each service type (e.g., cognitive behavioral therapy, individual counseling, social skills training, etc.) for justice-involved juveniles (Lipsey et al., 2010). Lipsey (2009) demonstrated, using a meta-analysis of over 500 high-quality studies, that the recidivism reductions associated with treatment services are not trivial. As example, the average recidivism reduction for those receiving cognitive behavioral treatment is 26%. Notably, Lipsey (2009) demonstrated that the type of service being provided was the strongest factor contributing to remaining recidivism-free, with cognitive behavioral, group counseling, behavioral, mentoring, and case management services all evidencing, on average, recidivism reductions of at least 20%. Lipsey focused on treatment services (counseling, skill building, multiple services) based on their association with recidivism reduction, while surveillance, deterrence, discipline, and restorative services were not associated with reductions in reoffending (on average; Lipsey, 2009). This is highly relevant to the current study as recidivism reductions are shown to stem from risk reduction and protective factor/strengths enhancement (Bonta & Andrews, 2016).

Specifically related to the SPEP in Florida (where the current study was conducted), residential programs are required by contract, and extensively monitored by the Florida Department of Juvenile Justice (FDJJ) for compliance in doing so, to provide a minimum of five days per week of group counseling (predominately cognitive behavioral therapy modalities), as well as individual counseling and family therapy. Further, residential programs are required to provide specific brand name interventions that are evidence-based and/or promising, and required to ensure participating youth receive appropriate dosages (contact hours for a specified period of time, as dictated by the SPEP) while maintaining fidelity and treatment quality of implementation (see Baglivio, Wolff, Howell, Jackowski, & Greenwald, 2018; Baglivio, Wolff, Jackowski, Chapman, Greenwald, &

Gomez, 2018; Baglivio, Zettler, Craig, & Wolff, 2021). As such, the SPEP is a fundamental component of residential programming in Florida.

Initial validation studies of the SPEP demonstrate the efficacy of the approach, as programs receiving higher scores on the SPEP assessment evidence lower recidivism rates (Lipsey, 2008; Lipsey, Howell, & Tidd, 2007; Mulvey, Schubert, Jones, & Hawes, 2020; Redpath & Brandner, 2010). Studies of youth placed in juvenile justice residential facilities in Florida (the focal population of the current study) show that each additional point in the SPEP 10-point rating of treatment quality was associated with an 11% reduction in reoffending (Baglivio, Wolff, Jackowski et al., 2018), while youth who received services matched to their assessed dynamic risk at SPEP-associated dosages evidenced significantly greater reductions in risk during placement and 17% lower subsequent recidivism upon reentry to the community (Baglivio, Wolff, Howell et al., 2018). Importantly, the matching of services to a youth's primary risk/needs plus achieving SPEP dosages combination led to significantly greater reductions in risk during placement and to lower recidivism for both youth with, and those without, extensive adverse childhood experiences (ACE) exposures as well (Baglivio, Zettler et al., 2022).

Unfortunately, and astonishingly, there is a lack of empirical research indicating whether any of these purported and research-supported juvenile justice best practices are effective for youth involved in the juvenile justice system presenting with co-occurring disorders specifically. Examining the effectiveness of matching treatment services while accounting for treatment quality and the dosage of actual services provided (at the individual level) is pivotal among youth placed in long-term juvenile justice facilities as the prevalence of psychiatric disorder has been shown to be highest among such youth—even when compared to youth placed in short-term secure detention upon arrest (Karnik et al., 2009).

The current study aims to address this critical oversight by examining the prevalence of co-occurring disorders among a multiyear, statewide sample of youth completing residential placement within the juvenile justice system in the state of Florida. Three specific goals drive the current study: 1) Determine the prevalence of mental health and substance use disorders, and their co-occurrence among youth placed in long-term juvenile justice facilities across the state of Florida; 2) Assess the impact of service matching to assessed dynamic risk factors, dosage of intervention services actually provided to each youth, and treatment quality/fidelity of those interventions on both changes in risk and protective factors during placement and post-release recidivism outcomes; and 3) provide policy recommendations related to the efficacy of best practices through the combination of service matching/dosage/treatment quality of treatment within residential facilities among youth presenting with co-occurring disorders.

Why Focus on Co-occurring Disorders?

While mental and substance use disorders are common among youth entering the juvenile justice system (e.g., Shufelt & Cocozza, 2006), youth in secure and out-of-home placements evidence even higher prevalence. Specifically, detained youth are up to 3 times as likely as youth who remain in the community to have a diagnosable mental health or substance use disorder (Cauffman, 2004; Kazdin, 2000; Otto, Greenstein, Johnson, & Friedman, 1992; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002; Wasserman, Ko, & Reynolds, 2004). Upwards of 65% of males and 33% of females under some form of juvenile confinement suffer from at least one psychiatric disorder (Teplin et al. 2002; Wasserman et al. 2002; Wasserman et al. 2005). Furthermore, approximately 50% of detained youth present with one or more substance use disorders (McClelland et al. 2004; Teplin et al. 2002), with more than 30% of males and 20% of females still reporting substance use disorders five years after release from out-of-home placements (Teplin et al. 2005). Youth in juvenile justice residential placements are a particularly policy-relevant population as psychiatric disorder prevalence

has been demonstrated highest among long-term incarcerated youth in comparison to general population youth—even when compared to offenders placed in short-term secure detention centers upon arrest (Karnik et al. 2009).

Co-occurring disorders, previously referred to as a dual diagnosis, refer to the presence of *both* one or more mental health disorders/diagnoses as well as at least one substance use disorder (see Hawkins 2009). It is very common for individuals with one psychiatric diagnosis to also qualify for other diagnoses (Ahonen, Loeber, & Brent, 2019; see also Arsenault et al., 2000; Corrigan & Watson, 2005; Fazel, Gulati, Linsell, Geddes, & Grann, 2009a; Fazel, Lichtenstein, Grann, Goodwin, & Långström, 2010; Witt, VanDorn, & Fazel, 2013). Importantly, studies show that the co-occurrence of diagnoses tend to carry a higher risk for serious outcomes than one single type of diagnosis (Ahonen et al., 2019).

In Florida specifically, prior work examining over 10,000 youth placed in juvenile justice facilities, demonstrates the prevalence of mental health disorders across race/ethnicity in male juveniles was 55-66% diagnosed as having conduct disorder, 28-43% with Attention-deficit/hyperactivity disorder (ADHD), 12-18% evidenced mood disorders, 4-8% explosive disorder, 5-6% Oppositional defiant disorder, and less than 5% each of diagnoses of adjustment, anxiety, eating, personality, and schizophrenia disorders/diagnoses (Baglivio, Wolff, Piquero, Greenwald, & Epps, 2017). Female prevalence rates were slightly higher (with the exception of conduct disorder, ADHD, and explosive disorder) at 45-58% diagnosed with conduct disorder, 26-30% with ADHD, 31-38% had mood disorders, 3-7% diagnosed with explosive disorder, 10-17% with Oppositional defiant disorder, 8-12% diagnosed as having anxiety disorders, and less than 5% each of diagnosed adjustment, anxiety, eating, personality, and schizophrenia disorders/diagnoses (Baglivio et al., 2017). Importantly, only 6-10% of males and 21-23% of females in those Florida programs were indicated to have received psychiatric treatment while in placement. Notably, the

extent of neither alcohol use nor substance use increased the odds of psychiatric treatment for males, while both alcohol and substance use problems increased psychiatric treatment among females (Baglivio et al., 2017). More recently, it was shown that 43% of over 12,000 youth placed in long-term Florida juvenile justice residential facilities evidenced substance use problems which interfered with life domains such as disrupting education, causing family conflict, interfering with keeping prosocial friend, causing health problems, contributing to criminal behavior, or causing increased tolerance and/or withdrawal problems (Wolff, Baglivio, Limoncelli, & DeLisi, 2020).

Meta-analysis reveals nearly 61% of all system-involved youth have been diagnosed with co-occurring mental health and substance use disorders (Shufelt and Cocozza 2006; see also Abram et al., 2003; Teplin et al., 2002; Wasserman et al., 2002). Prior research has documented the prevalence of co-occurring disorders among children/adolescents involved in the juvenile justice system (Abrantes, Hoffmann, and Anton 2005; Shufelt and Cocozza 2006; Turner et al. 2004), and a growing body of work has examined differences in court outcomes/dispositions comparing youth with co-occurring disorders to those without (e.g., Walker, Infante, & Knight, 2022; see also Campbell and Schmidt 2000; Cauffman et al. 2007; Espinosa et al. 2013; Gebo 2007). Walker and colleagues leveraged the Pathways to Desistance study data of over 600 juveniles with serious offending histories in examining the impact of mental health, substance use, and co-occurring disorders on juvenile court outcomes (Walker et al., 2022). Notably, findings indicated having any disorder was associated with out-of-home placements, however, having substance use disorders evidenced a stronger association with out-of-home placements (including secure detention). Those youth with co-occurring disorders were at increased odds of residential placement, while mental health disorders alone did not increase likelihood of adjudication (Walker et al., 2022).

Unfortunately, relatively minimal work has focused on the effectiveness of "best practices" in juvenile justice reform for youth with co-occurring disorders with respect to outcomes of success

(reduction in risk and/or recidivism). Walker and colleagues (2022) note the deleterious impact of this knowledge-gap, as a majority of youth involved in the juvenile justice system present with both substance use and mental health disorders concurrently. Worse still, mental health problems and substance abuse are significantly associated with juvenile recidivism (e.g., Trulson et al., 2005). While In their review of the literature, Ahonen and colleagues (2019) note the attributable risk of mentally ill individuals committing violence ranges approximately from 1% to 5% (e.g., Fazel & Grann, 2006; Swanson, 1994: Taylor, 2008; Vinkers, de Beurs, Barendregt, Rinne, & Hoek, 2012), for those with co-occurring disorders the risk of violence is likely substantively higher (Ahonen, Loeber, & Brent, 2019). The impact of substance use and abuse on juvenile offending has been well elucidated (e.g., Mulvey, Schubert, & Chassin, 2010).

Critically, prior work approximated that only 6% of detained youth are referred to mental health or substance abuse treatment during their stay in correctional facilities (Rogers, Zima, Powell, & Pumariega, 2001). Similarly, more recent work using screening and assessment data from both the Massachusetts Youth Screening Instrument-2 (MAYSI-2) and a risk/need assessment found that White males were provided access to mental health services at higher rates than Black males in a specific secure facility (Dalton et al., 2009). Fortunately, and progressively, Florida Administrative Code requires every youth with mental health and/or substance abuse diagnoses within juvenile justice residential facilities be provided screening, assessment, treatment planning and clinical services related to such disorders/concerns (F.A.C., Chapter 63N-1.001-1.015). Yet still, what has thus far not been addressed empirically is whether best practices in treatment provision improve outcomes for youth with co-occurring disorders. Importantly, the current study examines whether youth with co-occurring disorders who receive optimal treatment (discussed below) evidence greater reduction in risk and increases in strengths during placement and subsequently lower reoffending post-reentry and return to the community.

Juvenile Justice Evidence-based/Best Practice Standards

Best practice standards posit that evidence-based juvenile justice systems should rely on leveraging structured decision-making tools such as locally-validated risk assessment, a disposition matrix to guide placement decisions, and standardized methods to evaluate services (Howell, Lipsey, & Wilson, 2014). Data-driven juvenile justice agencies optimize success through a framework of graduated sanctions, from prevention through residential placement and aftercare that are appropriately resourced. Best practice posits only youth assessed as the highest risk be placed in residential programs, and only after community-based alternatives have been exhausted, following the Comprehensive Strategy for Serious, Violent, and Chronic Juvenile Offenders (Baglivio et al., 2014; Howell, 2003; Wilson & Howell, 1993). The Risk–Needs–Responsivity (RNR) model is unequivocally the most dominant paradigm guiding criminal and juvenile justice systems over the last quarter century (Andrews, Bonta, & Wormith, 2006, 2011; Howell, Lipsey, & Wilson, 2014; McGrath & Thompson, 2012; Peterson-Badali, Skilling, & Haqanee, 2015; Vose, Lowenkamp, Smith, & Cullen, 2009). According to the RNR model, juvenile justice systems must focus on risk and offending/reoffending reduction through three primary principles:

(1) *Risk Principle:* The intensity and duration of services should be commensurate with the risk to reoffend level of the youth served, with higher risk youth receiving more intensive services. Critical to the risk principle is the use of a validated assessment of risk and prioritizing resources to higher risk youth;

(2) *Need Principle:* Intervention services should target individualized (based on validated assessment) dynamic, changeable risk factors (criminogenic needs) empirically associated with offending/reoffending with evidence-based interventions; and

(3) *Responsivity Principle:* Services should leverage interventions and strategies proven effective (general responsivity), but with individualized delivery related to characteristics such as gender, culture, motivation to change, intellectual ability, and traumatic exposure (specific responsivity).

Results of prior research support both targeting higher risk individuals (Andrews & Bonta, 2003; Andrews et al., 1990; Baglivio et al, 2014; Lipsey, 2009; Lipsey et al., 2010; Lowenkamp & Latessa, 2005; Lowenkamp et al., 2006; Lowenkamp, Makarios et al., 2010) and matching treatment services to assessed criminogenic needs/dynamic risk (e.g., Andrews et al., 1990; Gendreau, Smith, & French, 2006; Luong & Wormith, 2011; Singh et al., 2014; Vieira et al., 2009; Vitopoulos et al., 2012; Vose et al., 2009). One critical concern leveraged against a large swath of service matching research is that prior work most often examined whether case plans included objectives that were matched to dynamic risk, whether individuals were referred for matched services, or whether there was some indication that the individual "completed" a matched service. However, for optimal effects, targeted treatment must have actually occurred (not simply listed on a case plan without indication of whether it did occur nor how often) and also be facilitated with fidelity (treatment quality) as well as be provided at optimal dosages (Lipsey, 2009). Toward that end, Mark Lipsey developed the Standardized Program Evaluation Protocol (SPEP), leveraging the largest database of hundreds of high-quality studies of interventions to reduce offending and/or reoffending among adolescents.

Standardized Program Evaluation Protocol (SPEP) and Intervention Dosage

Several "evidence-based" registries exist, such as Crime Solutions (crimesolutions.gov) and Blueprints for Healthy Development (blueprintsprograms.org), which include "brand name" interventions and treatment services which have been empirically evaluated to meet criteria for endorsement on the specific registry. These "model" and "promising" programs have treatment manuals, training requirements, and often fidelity monitoring instruments. They also have dictated dosages, such as 30 contact hours over the course of 10 weeks for Aggression Replacement Training (ART; Goldstein. Glick, & Gibbs, 1998). However, many treatment and interventions services provided in real-world settings are generic/homegrown programs or services without formal evaluation (which accounts for the paucity of interventions listed on registries/clearinghouses). Mark

Lipsey (2009) developed the SPEP through leveraging over 500 independent samples from 361 high-quality studies specifically examining interventions with juveniles and having offending/reoffending as an outcome measure. The meta-analysis illuminated the most essential characteristics for programs to achieve significant juvenile offending/reoffending reductions (Lipsey, 2009; 2014, 2018, 2020; Lipsey et al., 2010), which include:

1) Type of service (e.g., group counseling, skills training, cognitive behavioral, family therapy, etc.);
2) Risk level (target higher risk youth);
3) Treatment quality (adhere to the model intent with trained/credentialed staff); and
4) Dosage provided (face-to-face contact hours and duration of actual service in weeks).

The SPEP schematic includes dosage targets unique to each service type (the duration and contact hours for family therapy differs from that needed for group counseling, for example), which were derived from the included high-quality studies of that service type with reoffending as a reported outcome. Importantly, these dosage targets are contact hours of the actual service being provided, not the length of stay in a placement, such as a residential program. For example, a youth in a residential program for 6 months that received ART for 30 lessons over 10 weeks (fidelity to ART) would have a SPEP duration dosage of 10 weeks for that service, not the entire 6 months. The dosage target set is the median values necessary to achieve the average recidivism reduction demonstrated in the meta-analysis, such as dosage needed to achieve 26% reduction in recidivism for cognitive behavioral interventions (Lipsey et al., 2010). A youth must achieve or exceed the dosage target to be considered to have "hit" the targets (e.g., receiving 14.9 weeks of a 15-week target is not considered to have achieved SPEP-indicated dosage). The SPEP assigns points commensurate with each component's (risk, treatment quality, dosage, service type) statistical contribution to reduced delinquency as demonstrated in the meta-analysis and then standardized to a 0-100 scale to ease interpretation (Lipsey et al., 2010).

Several evaluations of the SPEP have been promising, with programs receiving higher scores on the SPEP demonstrating lower recidivism rates than those with lower SPEP scores (Lipsey, 2008; Lipsey, Howell, & Tidd, 2007; Mulvey, Schubert, Jones, & Hawes, 2020; Redpath & Brandner, 2010). Additionally, youth returning to their communities from residential placements in Florida, where the average treatment quality of interventions was higher (as assessed by SPEP guidelines), evidenced lower recidivism post-release than youth returning to the community from programs with lower fidelity treatment, with youth evidencing 11% lower odds of recidivism for every one-point (out of 10 possible points) increase in treatment quality (Baglivio, Wolff, Jackowski, et al., 2018). Further, receiving a treatment service matched to at least one of the youth's top 3 criminogenic needs and provided at optimal SPEP-dictated dosage for that service is shown to have resulted in greater assessed risk reduction from residential facility admission to discharge and a 17% lower recidivism rate post-release (Baglivio, Wolff, Howell et al., 2018). Importantly, matching services to assessed criminogenic needs and providing those services at optimal SPEP dosages is effective at reducing recidivism among residentially-placed youth both without and with extensive adverse childhood experiences (ACEs) exposures (Baglivio Zettler, et al., 2020). What is currently unknown, however, is whether matching services to criminogenic needs, providing services at SPEP-supported dosages, and higher treatment quality leads to similar positive outcomes (risk reduction, protective factor enhancement, and reduced recidivism) for youth with co-occurring mental health and substance use disorders. This is the knowledge gap the current study addresses.

The RNR paradigm is posited to reduce risk, enhance protective factors, and improve public safety through decreased (re)offending likelihood. Additionally, the reduction in risk (and subsequent reoffending) and enhancement of strengths/protective factors achieved through the use of the RNR model is believed to lead to shrinking the massive societal monetary expense needed to address high-risk youth, which has been estimated to exceed $2.6 to $5.3 million at age 18 (Cohen &

Piquero, 2009). Critically, practitioners must ensure dynamic risk reduction and protective factor enhancement are occurring during juvenile justice placement so that anticipated recidivism reduction occurs post-release. This establishes the essential importance of regular and consistent reassessment of each youth during placement (Vincent, Guy, & Grisso, 2012; see also Olver et al., 2007), and that this assessment and subsequent reassessment is focused on dynamic, changeable factors that are empirically related to reoffending (i.e., criminogenic needs).

Dynamic Risk and Protective Factors

Importantly, with respect to measuring progress during placement, the practice of reassessment has been demonstrated to improve predictive validity above that of initial assessment (e.g., Lloyd et al. 2020; Vincent et al., 2012), leading to best practice standards as "repeated assessments…identify fluctuations in areas of risk/need that can be used to inform case management and intervention efforts, even for serious offenders" (Mulvey et al., 2016, pp. 48). Within the treatment/prevention literature, a growing body of work has revealed that change in dynamic risk factors, as assessed by validated risk assessment tools, is measurable and demonstrates change over time, and that the likelihood of subsequent offending decreases when dynamic risk is reduced (Baglivio, Wolff, Jackowski, & Greenwald, 2015; Raynor, 2007; Schlager & Pacheco, 2011; Vose, Lowenkamp, Smith, & Cullen, 2009). This growing body of work has assessed changes in risk assessment scores over time, with less research examining whether such changes translate into increased or decreased recidivism. Interwoven in this notion of changing risk/protective factors over time is concept of whether such changes occur through targeted intervention (targeting services to assessed risk/needs).

More limited is research that has examined whether changes in risk (and/or protective factors) can be attributed to targeted interventions and how these changes may be related to

subsequent reoffending. Notable exceptions have examined changes in the risk of adult probationers as measured by the Level of Service Inventory–Revised (LSI-R; Raynor, 2007; Schlager & Pacheco, 2011; Vose et al., 2009), and the Federal Post Conviction Risk Assessment (PCRA; Lowenkamp et al., 2013). The invaluable findings from this work have informed practice by demonstrating that an individual's total/overall risk score can change over time and that those measured changes predicted recidivism, at least among adult probationers. While associating change in risk over time to subsequent justice system outcomes, a limitation of this work is that it has examined only the composite (overall) risk assessment scores (e.g., low, moderate, high risk), without addressing which specific dynamic risks are best targeted by practitioners to optimize recidivism reduction.

Schlager and Pacheco (2011) demonstrated that both the LSI-R composite scores and most of the subcomponent domain scores decreased during the parole period, while Brooks-Holiday and colleagues (2012) similarly found overall risk and criminogenic need reduction through participation in a reentry program. Both of those studies lend credence to the notion that change occurs, and that risk reduction is possible through programming. Wooditch and colleagues (2014) went further and examined whether reductions in risk/need improved probation outcomes. Among adult probationers, those with demonstrated decreases in risk in domains of familial criminal networks, income, and alcohol use had a lower rate of subsequent self-reported offending, while only changes in leisure/recreational activities were associated with changes in substance use (Wooditch et al., 2014). Examining adult male offenders' participation in a violence reduction program, Couplan and Olver (2020) found that Violence Risk Scale (VRS) change scores were associated with both community violence and general recidivism, controlling for baseline risk, and that those classified as high-risk with low change (little risk reduction) evidenced higher general recidivism. Cohen and colleagues (2016) examined over 64,000 adults under federal probation and found offenders whose risk decreased over time were less likely to reoffend than probationers whose risk was unchanged or

increased, with the exception of low-risk offenders whose risk reduction was irrelevant (as they were already low-risk initially; see also Vose et al., 2013). Similarly, Labrecque and colleagues (2014) found dynamic risk changes were related to recidivism in that both the absolute and the percentage of change in total risk were predictive of reoffending. More important to policy, they demonstrated that the use of reassessment and the calculation of percentage change scores outperformed the use of indicators drawn from a single (initial) assessment.

Recently, Stone and colleagues (2023) examined a 2010 sample of over 3,000 New Zealand parolees under supervision to determine whether acute risk factors decline uniformly or whether distinct group trajectories emerge. Acute risk factors are operationalized as dynamic risk factors that change rapidly over the course of minutes or days. They utilized a joint latent class modeling to identify the presence of distinct groups and measure the likelihood of recidivism as well as the time to recidivate. Their analysis leveraged data from nearly 100,000 dynamic risk assessments administered multiple times by supervision officers. Stone and colleagues (2023) identified four distinct group trajectories for acute dynamic risk factors: increasing acute risk scores, moderate decreasing acute risk scores, low decreasing risk scores, and rapid decreasing group scores. 88% of parolees fell under the low decreasing risk score and moderate decreasing acute risk score groups. They found statistically significant group differences as well, concluding that declines in risk scores are not uniform across parolees. Despite their findings, the joint latent class model did not produce any advantages over the joint models with no latent class structure (Stone et al., 2023).

Interestingly, Davies and colleagues (2023a) conducted a scoping review of previous risk assessment literature to determine whether intraindividual change is relevant to recidivism prediction beyond assessment risk scores at the end of treatment/placement alone. They conclude that current research has not yet established intraindividual change to be sufficient to predict recidivism itself but do find sufficient evidence to warrant further research when post-treatment/placement risk scores

are accounted for. Davies and colleagues (2023a) further suggest empirical tests should control for either baseline or post-treatment/placement risk scores when researching intraindividual change's relevance (e.g., depending on the research question, either control for initial risk or control for exit risk when examining the impact of changes in risk on recidivism).

Importantly, Wanamaker and Brown (2022) assessed changes in both risk *and* protective factors among 2,877 women on community supervision over a 30-month period. Results demonstrated that total overall risk scores reduced over time while total overall strengths increased, and that changes in risk predicted new charges and technical violations while changes in protective scores only predicted technical violations (Wanamaker & Brown, 2022). Notably, changes in neither risk nor strengths predicted new violent offending.

Unfortunately, the study of changes in dynamic risk/needs and subsequent outcomes among justice-involved juveniles is limited. Using the random assignment of at-risk juveniles to a delinquency prevention program, Hay and colleagues (2010) examined random assignment to a delinquency prevention program, finding that although changes in risk-seeking propensity were not attributable to the program itself, the observed changes were associated with subsequent self-reported delinquency. Baglivio and Jackowski (2015) examined the efficacy of a victim-impact restorative justice curriculum in reducing risk among juvenile offenders, finding that those youth randomly assigned to the intervention evidenced significantly more reduction in five criminogenic needs than the control group (peer relationships, antisocial attitudes, skills dealing with others, skills dealing with feelings, and impulse control skills). Although their study demonstrated that targeted intervention leads to a reduction in risk/needs, the study lacked analyses to associate these changes in risk with subsequent reoffending. Examining justice system outcomes among juveniles, Viljoen and colleagues (2017) found that changes in dynamic risk scores, relative to the adolescent's average

risk score, did not predict recidivism among 145 youth under probation supervision in the Greater Vancouver area.

Recently, the Council of State Governments, working towards making risk management and recidivism prevention more uniform, concluded there was greater change from violent reduction programming on dynamic risk factors for high-risk and need groups compared to lower-risk individuals with significantly fewer needs (Olver et al., 2022). These findings are in keeping with both the risk principle (prioritize services to higher-risk youth) and the need principle (target assessed needs empirically related to reoffending) of the Risk-Needs-Responsivity model described above. In a similar intent, Lovatt et al. (2022) aimed to broaden the applicability of youth risk and protective factor assessment tools, addressing the underrepresentation of females and racial/ethnic minorities in juvenile justice research. The author evaluated three assessment tools, the Violence Risk Scale-Youth Version (VRS-YV), Structured Assessment of Violence Risk in Youth (SAVRY), and Structured Assessment of Protective Factors-Youth Version (SAPROF-YV). Lovatt and colleagues (2022) found VRS-YV and SAVRY to have convergent validity, indicating a correlation between higher risk and fewer protective factors, while the SAPROF-YV showed divergent validity. Both VRS-YV and SAVRY demonstrated the superiority of dynamic over static measures in predicting recidivism. Gender differences were noted, with VRS-YV's family concerns domain being particularly relevant for females. Ethnocultural disparities were also observed, with Indigenous youth scoring higher, mainly in violent recidivism rates. SAPROF-YV was deemed better in measuring protective factors compared to SAVRY.

Krushas and colleagues (2024) leveraged a multistate sample of nearly 43,000 justice-involved youth to examine changes in needs assessment scores over time and propensity to reoffending (measured as days-to-recidivism). Findings demonstrated youth whose needs increased (overall increase in risk) or stayed the same were at heightened likelihood to reoffend in comparison

to those whose scores decreased. Results held true when examining changes in each risk/need domain as well where an increase in a specific domain's risk increased the hazard of reoffending (Krushas et al., 2024). Examining risk assessment trajectories, Kitsmiller and colleagues (2022) examined how race/ethnicity and time predict criminogenic risk scores on the Youth Level of Services/Case Management Inventory (YLS/CMI) tool. They leveraged a sample of 611 adjudicated youth ranging from 10 to 18 years of age in a Midwestern U.S. County. Using a fixed intercept model, they found that if it had been over 13.97 months since the initial assessment, the risk scores were predicted to decrease by 0.04 points every additional month. Additionally, evidence suggests that the incremental decrease in risk score stagnates as time increases by 1 month. Kitsmiller and colleagues (2022) demonstrated that risk scores decreased more substantially for White youth as compared to Black youth. Lastly, they concluded that risk scores decreased overall during the first 19 months and then began increasing at a rapid rate until their scores were higher at 48 months than they were at the initial assessment. However, these trajectories differed when analyzed by race in that White youth were found most amenable to risk reduction over time, while risk scores for Black youth remained stagnant. These and similar findings echo a concern with risk assessments related to racial bias, including the inclusion of static (unchangeable, historical) factors, such as criminal history indicators.

Related to this concern, Miller and colleagues (2022) examined the YLS/CMI in a sample of 1,270 juvenile offenders finding the static domain significantly predicted recidivism for White youth, but not for Black youth, while the dynamic domain predicted recidivism for both Black and White youth. Notably, the inclusion of static factors improved prediction beyond that of just dynamic factors for White youth only. Relatedly, Barnes-Lee and colleagues (2023) recently demonstrated that spending longer periods on probation was associated with increases in risk over time and that

the average risk reduction was lower for historically marginalized youth, meaning services may not be as effective for racial/ethnic minorities.

In addition to racial/ethnic bias concerns, recently, scholars have begun to more fully examine the distinction between "stable" and "acute" dynamic risk factors (e.g., Hanson & Harris, 2000). Acute risk factors are argued to change rapidly and are strongly related to recidivism immediacy (timing of recidivism), while stable dynamic risk factors change relatively slowly and are more associated with long-term recidivism risk (Hanson & Harris, 2000). Rapid and/or severe change in acute risk may signal imminent reoffending. Others describe the differences between acute and stable dynamic risk as stable risk factors being individual traits, whereas acute risk factors are either psychological states or triggering events (Beech & Ward, 2004). Davies, Lloyd, and Polaschek (2023b) demonstrated that acute change had a stronger association with imminent recidivism than short-term stable change. Acute risk tended to increase over the 2-3 weeks prior to recidivism. Significantly, acute change predicted imminent recidivism even with controls for the most current acute assessment (Davies et al., 2023b).

Specifically related to youth placed in residential facilities throughout Florida (the current study's focus), examining 12,302 juveniles found greater risk reduction in 6 of 17 dynamic risk domains from admission to release were associated with significantly lower subsequent recidivism rates (Baglivio, Wolff, Jackowski, & Greenwald, 2017). Advancing from prior work, that study included community context measures, finding some dynamic risk changes mitigated the effects of returning to disadvantaged communities (Baglivio et al., 2017). Advancing methodologically, leveraging a sample of nearly 12,000 male and 2,000 female Florida juveniles, propensity score matching was used in one study to ensure youth who subsequently did and did not reoffend were equivalent at initial assessment (at admission) and found that those who abstained from subsequent offending evidenced larger reductions in dynamic risk during residential placement (Baglivio, Wolff

et al., 2018). Further, research has examined the extent to which risk factors *and* promotive factors (factors which have a direct reducing influence on a negative outcome) change over time using a "buffer score" (buffer = promotive − risk). Examining risk assessment trajectories among a multiyear statewide sample of juveniles completing Florida residential placement demonstrated youth exhibit different trajectories of risk and protective factor changes over the course of placement using 90-day reassessments (Baglivio, Wolff, Piquero, Howell, & Greenwald, 2016). Critically, these trajectory groups were associated with subsequent offending. The better a trajectory group started off in terms of a risk-promotive balance (less risk, more strengths), the lower the subsequent recidivism, but, more importantly to treatment advocacy, the more the group improved over time (risk reduction and protective enhancement), the lower the likelihood of reoffending upon reentry (Baglivio et al., 2016). These results suggest youth can make improvements, and that reducing levels of dynamic risk and the extent of improvement is predictive of future success.

However, none of this prior work examined whether such risk reduction was evidenced during placement among youth with co-occurring disorders specifically, nor whether risk reduction translated to lower reoffending among this especially relevant population of youth in the system's care. Additionally, and an unfortunately reality of the vast majority of prior work, most studies have been focused exclusively on risk factors, to the detriment of neglecting "promotive" or protective factors (for exceptions, see Baglivio, Wolff, Piquero, Howell, & Greenwald, 2016; Garritsen, Janković, Masthoff, Caluwé, & Bogaerts, 2024; Wanamaker & Brown, 2022). The limited study that has accounted for both risk and protective factors has indicated that 1) the sum of risk and promotive domains is predictive of chronic serious offending, and 2) that this relationship is often linear, such that the greater the number of risk domains and the lower the number of promotive domains to which a youth is exposed, the more likely subsequent delinquency (Stouthamer-Loeber, Loeber, Wei, Farrington, & Wikström, 2002). The current study begins to address these

shortcomings, with emphasis on both risk and protective factors, including among youth with co-occurring disorders.

Residential Placement Post-Release Recidivism

Unfortunately, the national recidivism rate among youth completing residential placement is relatively unknown. However, specific studies foster our understanding, such as the Serious and Violent Offender Reentry Initiative (SVORI) study indicating approximately 63% self-reported (by juvenile sites) criminal activities and 38% violent or weapons offenses within 15 months post-release (Lattimore & Visher, 2010). A large body of research has further confirmed that youth admitted to juvenile justice residential facilities have the most extensive criminal histories, a greater preponderance of risk factors and fewer strengths, and evidence the worst subsequent outcomes (e.g., Caudill, 2010; Lattimore, MacDonald, Piquero, Linster, & Visher, 2004; Piquero, Brame, Mazerolle, & Haapanen, 2002; Trulson, Haerle, Caudill, & DeLisi, 2016; Trulson, Haerle, DeLisi, & Marquart, 2011; Trulson, Marquart, Mullings, & Caeti, 2005). Most relevant to the current proposal, youth transitioning from Florida juvenile justice residential programs have averaged a one-year re-adjudication rate of 38-48% over the past decade. This rate has remained relatively stable, while the seriousness of the criminal histories of those youth have increased more than 33% over that time (in terms of offense severity and prior offense history), increasingly becoming more "serious" each year (FDJJ, 2022). Heretofore unexplored are the recidivism rates specifically among youth with comorbid mental health and substance abuse disorders. The extent to which the provision of treatment matched to assessed dynamic risk, provided at SPEP-supported dosages with high fidelity/quality affects risk reduction and protective factor enhancement and/or translates to increasing or decreasing recidivism likelihood for youth with co-occurring disorders is critical to the youth involved, justice system policy, and public safety-related concerns.

Current Study & Plan for Report

The current study focuses on understanding the impact of matching treatment services to assessed dynamic risk/needs, achieving dosage targets as set by the SPEP, and treatment quality on 1) risk reduction during placement, 2) protective factor enhancement during placement, and 3) subsequent recidivism, among youth in juvenile justice residential placement with co-occurring mental health and substance abuse disorders. The remainder of this report describes the sample, data, and measures used to address the research questions, followed by the analytic strategy employed, study results, implications for research and policy and practice, study limitations, and concluding remarks.

Sample

The current study leveraged Florida Department of Juvenile Justice (FDJJ) data inclusive of all youth who completed a residential placement across three fiscal years (July 1, 2016 through June 30, 2019). Criteria for inclusion included all youth who had 1) An initial (at admission) and exit (prior to release) Residential Positive Achievement Change Tool (R-PACT) risk/needs assessment completed (required for all youth, necessary for examining risk/protective changes during placement), and 2) Treatment service dosage information of interventions received during placement. Additionally, for youth with multiple residential placements within the three fiscal years examined, only the first residential placement within that period was included. Furthermore, all youth placed in residential programs specifically for juveniles with sexual offending treatment needs were excluded from the current study (based on their low recidivism base rates and differing treatment needs). These criteria resulted in a 5,587 youth that completed a FDJJ residential placement during the study timeframe. Additional exclusions included 2 youth without a MAYSI-2 at admission, 13 youth classified as "other" race/ethnicity, 208 youth placed in programs for juveniles with sexual offenses for sexual offense treatment specifically, and 165 youth who were not from Florida (committed offenses while

visiting Florida) due to concerns about adequate recidivism data, resulting in a final sample of 5,469 youth included in the analysis file. The FDJJ maintains the Juvenile Justice Information System (JJIS) which houses data inclusive of complete offense, placement, risk assessment, and intervention dosage (for youth placed in residential programs) for all youth arrested under the age of 18 in Florida, which was used for the current study, in conjunction with three annual data files of program completions with an indicator of recidivism. Additionally, the Massachusetts Youth Screening Instrument-2 (MAYSI-2) administered at admission to the residential facility was included (which is also maintained in the FDJJ JJIS).

To provide context, FDJJ contracts with private providers for the operation of all juvenile justice residential facilities statewide (uniquely residential placement in Florida is 100% privately operated), which range in capacity from 20 to 96 beds. All programs are "specialized", such that every youth placed in a given facility has similar overarching treatment needs (i.e., substance abuse treatment, comprehensive mental health needs, treatment needs related to sexual offending), where services are individually tailored within the specialized programs. In Florida, only a judge (who operate independently from FDJJ) can dispose a youth in a residential program, and only a judge can release that juvenile. Length of stay in residential is indeterminate; based on the completion of an individualized performance plan and treatment plan, which is guided by both risk/needs assessment results and any clinical diagnoses. Notably, those placed in maximum risk facilities do have a minimum length of stay of 18 months and can be held up to 22 years of age. All youth without a high school diploma or equivalent attend school (within the program, taught by certified teachers) year-round, and all youth are assigned a case manager and a therapist. Additionally, all youth with a mental health or substance abuse condition/diagnosis must receive treatment for that issue as required per Florida Administrative Code. All youth placed in a FDJJ residential program receive individual counseling, family therapy, and treatment groups provided by licensed (or supervised)

mental health professionals, with services based on their individualized assessed needs (as per the R-PACT and clinical assessments). Group therapy includes primarily cognitive behavioral therapies (CBT), social skills training, substance abuse prevention or treatment (dependent on histories and clinical diagnoses), anger management, healthy relationships, and trauma- specific treatment (as applicable). The services provided at each facility are dictated by contract (which services and how many days per week of each). Mental health groups occurred a minimum of five days per week for all programs across the state at the time of the current study.

Further, as per FDJJ policy, all youth are assessed with the Residential Positive Achievement Change Tool (R-PACT) risk/needs assessment at admission, every 90 days thereafter, and prior to release (see http://www.djj.state.fl.us/partners/our-approach/PACT/RPACT). The R-PACT is administered as a semi-structured interview protocol by bachelor-level case management staff who have completed a standardized 2-day Motivational Interviewing training and a 3-day R-PACT software and case planning training (inclusive of interrater reliability exercises). Selection of forced-choice responses to each item produces software-scored dynamic and static risk and protective scores for each domain (with the exception of criminal history which produces only static risk). The R-PACT then "rank orders" dynamic risk domains such that the dynamic risk domain assessed with the highest percentage of the maximum risk score of that domain is ranked highest. For example, a dynamic risk domain scored as having 100% of the maximum possible dynamic risk score of that domain would be ranked above a dynamic risk domain with, say 80% of its maximum possible risk score. The R-PACT is required to be used by service providers in developing the individualized treatment/care plan for each youth.

The R-PACT administered at admission, the R-PACT administered prior to release, and the MAYSI-2 administered closest to residential admission were the source of most study measures, described below. Having an initial (at admission) and exit (prior to residential completion) R-PACT

allows for examining the extent to which dynamic risk and protective factors changed during placement.

Measures

Identifying Co-Morbid Youth

Mental health problems are defined as the presence of one or more major mental or personality disorder as defined by the DSM-V (Diagnostic and Statistical Manual of Mental Disorders (5th edition); American Psychiatric Association, 2013). As such, the current study draws from information on mental health problems captured by the Residential Positive Achievement Change Tool (R-PACT). The following diagnostic categories are included as individual items within the R-PACT assessment: Adjustment, Anxiety, ADHD, Conduct, Eating, Intermittent explosive, Mood, Oppositional defiant, Personality, Schizophrenia, and Psychotic disorders. Youth indicated to have one (or more) such diagnoses were classified as having a *mental health diagnosis* (= 1, else = 0). Of note, substance use diagnoses are not included.

To ensure accurate designation of substance use disorders and therefore co-occurring disorders, the current study leveraged the MAYSI-2 screening of each youth conducted at admission to the residential facility to assess substance use "hits". The MAYSI-2 Alcohol/Drug Use scale examines both the frequency of use of alcohol/drugs, as well as the risk of substance abuse or psychological reaction to lack of access to substances through eight standardized items (Grisso & Barnum, 2006). Prior work has demonstrated a very strong association between the Alcohol/Drug Use scale and meeting DSM-IV criteria for substance abuse/dependence disorder (AUC = ranging from .80 - .87; Hayes et al., 2005; see also Archer et al., 2010; Wasserman et al., 2004).[1] For the

[1] Unfortunately, any record of any substance abuse diagnosis made by clinicians at the residential facility during the course of placement are not stored electronically and thus are unavailable for this sample of youth who have already

current study, the MAYSI-2 "Caution" score was used as the cut-off. Youth evidencing MAYSI-2 Alcohol/Drug Use scale scores above the cut-off score were classified as having an *alcohol/drug use issue* (= 1, else = 0).

The exact diagnostic categories drawn from the R-PACT, coupled with the MAYSI-2 Alcohol/Drug Use scale cut-off scores allowed for capturing the presence of mental health disorders, substance use disorders, and their co-occurrence among youth in residential placement. The measure of co-morbidity was captured dichotomously where youth with both mental health diagnoses (R-PACT indicated) and substance use issues (MAYSI-2 Alcohol/Drug Use scales scores about the cut-off were considered to have co-morbid disorders (= 1, else = 0). 55.7% of the full sample evidenced a mental health diagnosis, 31.5% an alcohol/drug use issue, and 19.1% of the full sample were indicated to have *co-occurring mental health and substance use issues* (see Figure 1).

completed their treatment. The location and availability of these paper records is uncertain, therefore attempting to code this information in manually for each youth in the analysis is likely infeasible. Therefore, we rely on the MAYSI-2 indicators of potential substance abuse uses as our indicator in the current study.

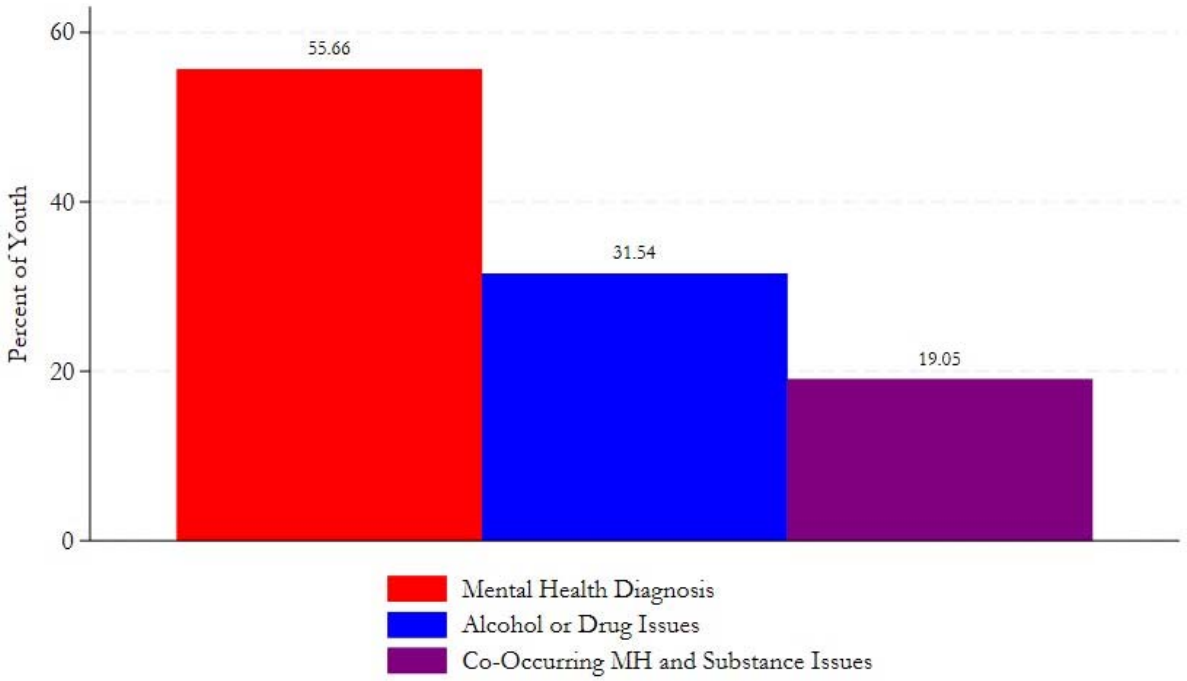

Figure 1: The prevalence of mental health, alcohol or drug issues and their co-occurrence.

Dependent Measures- Change in Risk and Protective Factors

Critical to the current study are the risk/need information assessed at admission, every 90 days thereafter, and prior to release for each juvenile. This assessment, the R-PACT, is administered as a semi-structured interview protocol in which the trained assessor selects forced-choice responses to items across distinct life domains. All R-PACT assessors are bachelor's level case management staff who have successfully completed both a standardized two-day motivational interviewing training and a three-day R-PACT assessment and case planning training. The R-PACT domains include: criminal history, school, use of free time, vocational, relationships, family, substance use, mental health, attitudes/behaviors, aggression, and social skills. The R-PACT software then produces both static and dynamic risk scores for each domain (with the exception of criminal history which results in only a static risk score). Additionally, each domain has static and dynamic protective scores (again,

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with the exception of criminal history). The current study uses both the initial R-PACT (at admission) and exit R-PACT (prior to release) in the calculation of both risk and protective change scores for each dynamic risk domain, dynamic protective scores, and overall dynamic risk and overall dynamic protective (considering all dynamic domains in concert).

In keeping with prior research in this area (Baglivio, Wolff, et al., 2018; Baglivio et al., 2017; Vose et al., 2009), the dynamic risk and dynamic protective change scores for each domain is the percentage change from Time 1 (admission) to Time 2 (discharge), and equals the percentage of the maximum possible risk (or protective) of the exit score minus the percentage of the maximum possible risk (or protective) of the initial score. The more negative the score, the more the risk of that particular domain was reduced during the youth's residential placement.

For example, a youth scoring 8 dynamic risk points of a maximum 10 on a particular domain on the initial R-PACT and 2 dynamic risk points of a maximum 10 on the exit R-PACT for the same domain would have a dynamic risk change score of ((2/10) - (8/10)) = -0.6 or a 60% reduction in risk in that domain. The following dynamic risk and dynamic protective factors domain changes, developed from R-PACT domains, were included (note: each domain produces a software-scored dynamic risk score and a dynamic protective score):

- *3B-Current School Status:* Current academic school status (e.g., values education, comfortable talking to teachers, conduct, removals from classroom, grades);
- *3D-Current Vocational Status*: Current vocational training status (e.g., belief in the value of vocational training, vocational instructors youth feels comfortable talking with, conduct during vocational training, removals from vocational training).
- *4B-Current Use of Free Time*: Current use of structured/unstructured recreation/leisure time (e.g., current involvement in structured non-academic activities, current use of unstructured free time);

- *5B-Employability*: Employability (e.g., understanding what is required to maintain a job, employment aspirations, acquired academic/vocational skills);
- *5D-Supervised Tasks*: Program supervised tasks (e.g., behavior, performance, and cooperation while performing tasks);
- *6B-Current Peer Relationships*: Current relationships
- *7B-Current Family Relationships*: Current parent/caretaker relationships (e.g., contact with parents/caretakers, parent willingness to help youth, parent participation in treatment, parent problem history, sibling problem history, family members youth feels close to, conflict in the household, parent characterization of youth's antisocial behavior);
- *8B-Current Alcohol and Drugs*: Current alcohol and drugs (e.g., attitude towards substance use, types of treatment);
- *9B-Current Mental Health*: Current mental health (e.g., suicidal ideation, type of treatment, compliance, mental health problems interfere with working with youth);
- *10-Attitudes / Behaviors:* Current attitudes and behaviors (e.g., optimism, impulsive, belief in control over behavior, empathy/remorse, respect for property and authority, attitude towards rules and laws, accepting responsibility for behavior);
- *11-Current Aggression*: Current aggression (e.g., frustration tolerance, belief in verbal and physical aggression to solve problems, aggressive behavior);
- *12-Current Skills*: Current skills (e.g., consequential thinking, goal setting, problem-solving, situational perception, monitoring internal and external triggers);
- *12A-Dealing with Others*: Skills for appropriately dealing with others (e.g., listening, starting a conversation, asking a question, saying thank you, introducing self and

others, giving compliments, asking for help, giving and following instructions, apologizing);

- *12B-Dealing with Difficult Situations*: Skills for appropriately dealing with difficult situation (e.g., making and answering a complaint or accusations, dealing with embarrassment, being left out, standing up for a friend, response to frustration, responding to failure, getting ready for difficult conversations, dealing with group pressure).
- *12C-Dealing with Feelings/Emotions:* Understanding one's own feelings, expressing feelings, understanding the feelings of others, dealing with someone else's anger, expressing affection, dealing with fear.
- *12D-Controlling Impulsive Behavior*: Techniques for controlling impulsive behaviors leading to trouble (e.g., reframing, replacing antisocial thoughts with prosocial thoughts, diversion, relaxation, problem-solving, negotiation, relapse prevention);
- *12E-Controlling Aggression*: Techniques for controlling aggression (e.g., asking permission, sharing thoughts, helping others, negotiating, using self-control, standing up for one's rights, response to teasing, avoiding trouble, keeping out of fights);

Dependent Measures- Recidivism

Recidivism was measured dichotomously as future delinquent or criminal behavior operationalized as readjudication or reconviction within 365 days of completion of the residential program (= 1, else = 0). Notably, this measure is inclusive of both juvenile and adult records, as some youth will have been 18 years or older upon completion of residential placement or will have turned 18 years of age during the follow-up period. The recidivism rate of the full sample is 46.6% (see Table 1).

Independent Measures- Treatment Quality, Matching, Dosage

Treatment Quality. The current study operationalized treatment quality based on past research (Baglivio, Wolff, Jackowski, Chapman et al., 2018). More specifically, information on treatment quality was derived from an annual SPEP assessment conducted by FDJJ quality improvement staff who are specifically trained in examining the SPEP treatment quality indicators. The SPEP evaluates how closely delinquency interventions, as provided, align with the features of the most effective evaluated programs in the field, including those with high quality evaluations and demonstrated reductions in recidivism. This allows the treatment quality component of the SPEP to identify shortcomings in treatment fidelity, and provides guidelines for improvement in order to optimize intervention effectiveness.

Treatment quality ranges from a possible zero to ten points. The seven treatment quality indicators, all assessed on either a zero–one or a zero–one–two scale, are summed to arrive at the treatment quality score for each assessed intervention. Treatment quality includes: 1) whether the clinician/staff delivering the service has been trained specifically on that service, 2) whether a detailed manual/protocol dictates delivery of the service, 3) whether independent observation of an actual service being provided adhered to the model protocol (independent/external fidelity monitoring), 4) the extent of turnover in the staff delivering the service, 5) whether the service is monitored for fidelity to the model at least once per month per staff delivering the service (internal fidelity monitoring), 6) whether a process of corrective action remediates identified deficiencies, and 7) whether each clinician/staff delivering the service is evaluated specifically on the delivery of that service (staff evaluation). The quality of the interventions which the youth specifically was provided (i.e., at the youth level) was attributed to each youth (rather than all interventions in the residential facility, only those interventions a given youth actually received composed the *treatment quality score*

for that youth during their placement). This provides a more precise look at the quality of treatment received by youth with co-occurring disorders serving residential placements across the state.

All of the interventions the youth received were considered (range 2-6), such that an average treatment quality score was measured as the mean treatment quality score of all FDJJ-assessed interventions provided to a given youth during their time in residential placement. If a youth received an intervention with a score of five for one intervention, and a score of seven for another, the youth would have an average treatment quality score of six ((5+7)/2 = 6). This conceptualization allows for examining whether the average quality of the interventions a youth receives predicts greater reduction in dynamic risk, enhancement in protective factors, and recidivism. Notably, the median treatment quality rating for the full sample was 8.5 (out of 10), with 51.5% of youth indicated to have scored above the median on treatment quality (see Table 1).

Service Matching. An indicator of matched treatment was used to identify those youth with co-occurring disorders who received a treatment that aligns with one of their primary treatment needs. The classification of a youth's top three needs was based on the initial R-PACT risk/need assessment completed at the time of admission to a residential program (see details on the R-PACT provided above). The percentage of maximum possible risk for each of the 10 dynamic risk domains was used to rank order criminogenic needs (the 3 dynamic domains with the highest percentage of maximum risk = top 3). Whether an intervention received is to be classified as a 'match' to the individualized criminogenic needs was based on the stated intervention description and review of curriculum topics listed in the intervention's table of contents (i.e., the intervention was designed to address a criminogenic need that was one of the youth's top three dynamic risk factors). Youth who received an intervention designed to address his/her highest-ranking dynamic risk domain was classified as having *treatment matches top need* (= 1, all other youth = 0), whereas youth who received at

least one intervention designed to address one of his/her top three highest ranking dynamic domain was classified as *treatment matches top 3 need* (= 1, else = 0).

Adequate Dosage. The first measure of treatment dosage to be used in the proposed study is an indicator of adequate *contact hours*. Contact hours, as per the SPEP, include face-to-face hours of the actual intervention and not any case management, assessment, or other related services that may be provided in conjunction with the service. For example, for Aggression Replacement Training (ART), only hours spent in a group setting receiving one of the required 30 ART sessions count as contact hours. Youth who were provided contact hours at or above those stipulated by the SPEP for a given intervention type (e.g., cognitive behavioral, skill building, etc.) for at least one intervention received were classified as achieving adequate treatment dosage, termed *hit SPEP target hours* (= 1, else = 0).

The second measure of treatment dosage includes an indicator of adequate treatment duration measured in weeks. Again, the service type (cognitive behavioral therapy, family therapy, etc.) dictates the recommended treatment duration as per the SPEP. Youth who were provided at least one intervention during placement at or above the duration of target weeks of service stipulated by the SPEP are classified as having *hit SPEP target weeks* (= 1, else = 0). Finally, a third measure of *hit SPEP weeks and hours* was used to classify youth who achieved/exceeded both the target contact hours and the target weeks of service dictated by the SPEP for at least one intervention received during placement (= 1, else = 0).

Importantly, the service type to which each intervention falls according to the SPEP is classified by FDJJ staff trained by Dr. Lipsey on the SPEP assessment. The FDJJ has been assessing each intervention provided within residential programs using the SPEP assessment since 2014.

Criminal History Covariates

Official delinquency onset and prior offending measures were included to control for the influence of criminal history on study outcomes. Each measure was garnered from the initial R-PACT

administered at admission to the focal residential placement. Importantly, all criminal history measures are automated into the R-PACT software from the FDJJ JJIS, eliminating the need for youth recall of prior referrals (equivalent to an adult arrest) or staff deciphering how to classify prior offending.

Specifically, a*ge at first offense* was classified according to the R-PACT protocol as 12 and under, 13 to 14, 15, 16, or over 16 years of age at the time of his/her first arrest (coded 1-5 such that higher values indicate an older age at time of first referral). *Misdemeanor referrals* groups youth as having none or one, two, three or four, or five or more prior misdemeanor referrals (coded 1-4, higher values indicating more prior misdemeanors). *Felony referrals* groups youth as having none, one, two, or three or more prior felonies (coded 1-4, higher values indicating more prior felony offenses). *Against-person misdemeanors* classified youth as having none, one, or two or more prior violent misdemeanors (coded 1-3, higher values indicating more prior violent misdemeanors). Similarly, a*gainst-person felonies* grouped youth into having none, one or two, or three or more prior violent felony offenses (coded 1-3, higher values indicating more prior violent felonies). *Weapon referrals* is a dichotomous indicator of whether the youth had at least one prior referral for which the most serious offense was a firearm/weapon charge or a weapon enhancement finding. *Felony sexual referrals* distinguished youth who had none, one, or two or more prior felony sexual offense referrals (coded 1-3, with higher values indicating more prior felony sexual offenses).

Importantly, only referrals that resulted in diversion, adjudication withheld, adjudication, deferred prosecution, or referral to adult court are included (e.g., referrals where charges were dropped or the youth was determined what would be the equivalent of "not guilty" in adult court were not included as criminal history).

Demographic and Placement Indicators

Several demographic indicators and measures of the youth's experience in the residential placement were included. *Sex* assigned at birth distinguished females from males (male = 1; 85.9% of the full sample, see Table 1), and Race/ethnicity was captured as a series of dichotomous indicators of *White*, *Black*, and *Hispanic*. Importantly, in keeping with FDJJ protocol, ethnicity supersedes race such that all youth classified as White and all youth classified as Black are non-Hispanic, while Hispanic youth may be either White or Black.

With respect to the youth's residential placement, *length of stay* was measured continuously as days from admission to discharge from the residential facility, a*ge at release* was measured continuously as the age at which the youth was at the time of discharge from the facility into the community, and, finally, *psychotropic medication* was included as a measure of whether the youth had a psychotropic medication alert in the FDJJ JJIS (= 1, else = 0). Importantly, related to psychotropic medication, the FDJJ information system maintains specific critical alerts for each youth that enters the juvenile justice system in Florida. These alerts are mandatory for each youth, where users of the centralized database must add, edit, and update required alerts. One such alert is an indicator of the youth being prescribed psychotropic medication, labeled in the system as "Medication-Psychotropic." Adding this alert for a given youth must be validated by medical staff (for instance, the physician, psychiatrist, or nurses at a residential facility). The current study measures psychotropic medication as a dichotomous indicator, with those having a medication-psychotropic alert coded 1, and all others coded 0. Importantly, parental/guardian consent is required for all psychotropic medication administration to youth (see Wolff, Baglivio, & Intravia, 2022).

Analytic Approach

The current project takes a broad and multipronged approach to the analyses presented in the report. The analyses presented within include a combination of descriptive, bivariate and multivariate statistics designed to answer the main research questions posed in this project.

The analysis begins with descriptive statistics to summarize the characteristics of the sample of youth, which includes demographic information (e.g., age, gender, race, and ethnicity), history of offenses, and our measures of treatment provision. To explore the relationship between categorical variables (e.g., co-occurring mental health and substance use and youth characteristics), chi-square tests are conducted. This test helps to determine if there are significant associations between categorical predictors and whether or not youth were suffering from both mental health and substance abuse issues. These comparisons provide insight into this unique, policy-relevant group of youth within the juvenile justice system in Florida.

T-tests are used to assess the mean differences between groups that received treatments that were matched, of adequate dosage, and of high quality versus those that did not. In this context, "matched" refers to whether the treatment youth received was matched to one of their top three criminogenic needs (as rank-ordered by the R-PACT dynamic risk scoring). "Adequate dosage" pertains to the number of treatment hours and weeks of treatment provided, and indicates whether that duration met or exceeded that recommended by the SPEP protocol. "High quality treatment" relates to the implementation fidelity of the intervention, ensuring it is delivered as intended. By applying t-tests, we compare the average outcomes (e.g., reductions in risk or increases in protective factors) of those who received the intervention under these optimal conditions against those youth who did not. This allows for a nuanced understanding of how treatment matching, quality and dosage contribute to differences in outcomes among youth-serving residential placements in Florida.

Importantly, all differences are assessed among both the full sample of youth as well as for the subsample of youth who suffer from co-occurring mental health and substance use issues.

Ordinary Least Squares (OLS) regression is utilized to model changes in dynamic risk and protective factors which occurred between a youth's entry into the program and their release. OLS regression allows for the analysis of how changes in these factors correlate with our focal measures of the treatment provided, controlling for other variables in the model. This allows us to isolate the effect of treatment matching, dosage and quality on changes in dynamic risk and protective factors during residential placement.

Finally, to predict juvenile recidivism, logistic regression models are employed. These models are particularly suited for binary outcomes, such as reoffending (yes/no). The logistic regression analysis involves multiple predictors, including both static (e.g., history of offenses) as well as the impact of our focal treatment variables, to estimate the odds of recidivism.[2]

Results

Descriptive Results

Table 1 provides a description of the full sample of youth who served a residential placement during the time period being examined. The vast majority of the sample was male (85.9%) and Black (60.9%). Just over half the youth in the sample had received a mental health diagnosis (55.7%), while nearly one-third were identified as having substance use issues (31.5%). Just over nineteen percent of youth in this sample were identified as having co-occurring mental health (MH) and substance use (SU) issues. A large proportion of youth also had a history of Conduct Disorder (CD) or

[2] In the proposal we suggested that we might be able to assess time to recidivism using a series of Cox survival models. Unfortunately, due to changes in the information received by DJJ by other sources (i.e. FDLE) we were unable to obtain pertinent information, such as the date of the recidivism offense, that are required to complete these more nuanced analyses.

Table 1: Sample Description (n = 5,469)

Sex		**TX Matches Top 3 Need**		**Age at First Offense**		**Weapon Referrals**	
Female	14.1%	No	10.3%	12 & Under	29.8%	None	76.7%
Male	85.9%	Yes	89.8%	13 to 14	43.4%	One +	23.3%
Race/Ethnicity		**TX Matches Top Need**		15	15.8%	**Felony Sex Referrals**	
White	26.0%	No	59.6%	16	8.5%	None	98.6%
Black	60.9%	Yes	40.4%	Over 16	2.5%	One	1.3%
Hispanic	13.1%	**Hit SPEP Target Hours**		**Misdemeanor Referrals**		Two +	0.1%
Mental Health Diagnosis		No	15.4%	None or One	39.1%	**Recidivism**	
No	44.3%	Yes	84.6%	Two	21.2%	No	59.5%
Yes	55.7%	**Hit SPEP Target Weeks**		Three or Four	25.3%	Yes	46.6%
Alcohol/Drug Issue		No	24.5%	Five or More	14.3%		
No	68.5%	Yes	75.5%	**Felony Referrals**			
Yes	31.5%	**Hit SPEP Weeks & Hours**		None	5.2%		
Co-Occurring MH & Substance Use Issues		No	30.2%	One	21.1%		
No	81.0%	Yes	69.8%	Two	22.6%		
Yes	19.1%	**TX Quality at or Above Median**		Three +	51.1%		
Conduct Disorder or ODD		No	48.5%	**Against-Person Misds**			
No	34.0%	Yes	51.5%	None	60.4%		
Yes	66.0%	**Psychotropic Meds Ever**		One	24.5%		
ADHD		No	56.1%	Two +	15.1%		
No	61.3%	Yes	43.9%	**Against-Person Felonies**			
Yes	38.7%	**Psychotropic Meds Current**		None	53.4%		
		No	69.4%	One or Two	41.2%		
		Yes	30.6%	Three +	5.4%		

Oppositional defiant disorder (ODD) (66%) and ADHD (38.7%). Nearly forty-four percent of youth had been prescribed psychotropic medication at some point, while just over thirty percent were currently receiving such medication during the focal residential placement.

In terms of the treatment indicators (labeled "TX" in Table 1), it was observed that the vast majority of youth received a treatment that was matched to one of their top three criminogenic needs as required by department policy (89.8%), while a sizeable proportion received a treatment matched to their top (highest ranked) criminogenic need (40.4%). Regarding treatment dosage, three-quarters of youth received the recommended number of weeks in treatment (75.5%), and nearly eighty-five percent of youth received the target hours. When looking at both hours and weeks, nearly seventy percent of youth received the recommended dosage as recommended by Lipsey's SPEP protocol.

Finally, Table 1 provides a tabulation of a number of criminal history measures for the full sample of youth under study. The vast majority of youth serving residential placements during this period had at least one felony referral, while just over half had three of more felony referrals (51.1%). Just over forty-five percent of the youth had one or more against-person felony referrals (46.6%), while much fewer had weapon-related referrals and very few had referrals for sexually-related offenses[3]. Within one year of completion of their residential placement, 46.6% of youth recidivated, defined here as readjudication/reconviction for an offense which occurred within one year of their release.

Comparing Youth with Co-Occurring Disorders

Table 2 provides a comparison between youth who suffer from co-occurring MH and SU issues and the remainder of youth serving a residential placement. Youth with co-occurring issues were more likely to be female. A larger proportion of co-occurring youth were also White as compared to the remainder of the sample. There were no differences in diagnoses for CD or ODD between the groups, while comorbid youth were more likely to have an ADHD diagnosis. As might

[3] A reminder that juvenile sex offender programs were excluded from this analysis.

be expected, youth with co-occurring MH and SU issues were more likely to have been prescribed psychotropic medication, both previously and during the focal placement.

Table 2: Demographics by Presence of Co-Occurring Mental Health and Substance Use Issues

	Not Co-Occurring	Co-Occurring MH & SU	Chi-Square
Sex			
Female	13.1%	18.5%	$X^2 = 20.2$, $p < .001$
Male	86.9%	81.5%	
Race/Ethnicity			
White	22.2%	42.1%	
Black	65.2%	43.0%	$X^2 = 200.7$, $p < .001$
Hispanic	12.7%	14.9%	
Conduct Disorder or ODD			
No	33.8%	34.7%	$X^2 = 0.3$, $p > .05$
Yes	66.2%	65.3%	
ADHD			
No	63.4%	52.4%	$X^2 = 43.1$, $p < .001$
Yes	36.6%	47.6%	
Psychotropic Meds Ever			
No	58.7%	45.1%	$X^2 = 63.8$, $p < .001$
Yes	41.3%	54.9%	
Psychotropic Meds Current			
No	71.6%	60.2%	$X^2 = 51.7$, $p < .001$
Yes	28.4%	39.8%	

Table 3 examines the differences in criminal history between the two groups. Results suggest fewer differences than among the demographic measures. The only significant difference between the two groups was that youth with co-occurring issues had fewer felony referrals than the comparison group, although these results were relatively minor. There were no differences observed in age at first offense, the number of misdemeanor referrals, against-person referrals, or referrals for weapons, or sex offenses. Also important, the youth with co-occurring MH and SU issues recidivated at a nearly identical rate to the remainder of youth.

Table 3: Criminal History by Presence of Co-Occurring Mental Health and Substance Use Issues

	Not Co-Occurring	Co-Occurring MH & SU	Chi-Square
Age at First Offense			
12 & Under	2.5%	2.6%	
13 to 14	8.5%	8.6%	
15	15.5%	17.1%	$X^2 = 4.87$, $p > .05$
16	43.2%	44.5%	
Over 16	30.4%	27.2%	
Misdemeanor Referrals			
None or One	39.1%	39.0%	
Two	21.3%	20.8%	$X^2 = 1.69$, $p > .05$
Three or Four	25.5%	24.6%	
Five or More	14.1%	15.6%	
Felony Referrals			
None	4.8%	6.9%	
One	20.8%	22.3%	$X^2 = 10.05$, $p < .05$
Two	22.6%	22.4%	
Three +	51.7%	48.5%	
Against-Person Misds			
None	61.1%	57.4%	
One	23.9%	26.9%	$X^2 = 5.25$, $p > .05$
Two +	15.0%	15.7%	
Against-Person Felonies			
None	52.7%	56.0%	
One or Two	41.8%	38.9%	$X^2 = 3.50$, $p > .05$
Three +	5.5%	5.2%	
Weapon Referrals			
None	76.9%	75.6%	$X^2 = 0.78$, $p > .05$
One +	23.1%	24.4%	
Felony Sex Referrals			
None	98.6%	98.6%	
One	1.3%	1.4%	$X^2 = 1.37$, $p > .05$
Two +	0.1%	0.0%	
Recidivism			
No	53.4%	53.8%	$X^2 = 0.08$, $p > .05$
Yes	46.7%	46.2%	

Table 4 presents a detailed analysis of the top criminogenic needs among youth serving a residential placement, distinguishing between the full sample of youth and those with co-occurring MH and SU issues. It identifies the primary, secondary, and tertiary needs in both groups. Among

both groups, employability appeared as the top criminogenic need, followed by relationships and attitudes. Other reoccurring domains include school and social skills. The table further breaks down the percentages associated with each need, highlighting the complex interplay of criminogenic needs and the importance of tailored interventions.

Table 4: Top Criminogenic Needs among Youth Serving a Residential Placement

Panel A: Full Sample of Youth					
Top Need Domain	%	**Second Highest Need**	**%**	**Third Highest Need**	**%**
Employability	40.0	Relationships	19.8	Attitudes	20.9
Social Skills	15.5	School	16.9	School	16.6
Relationships	15.2	Social Skills	15.9	Relationships	15.4
Aggression	8.5	Aggression	13.1	Aggression	14.9
School	7.9	Attitudes	12.7	Social Skills	11.3
Substance abuse	4.4	Employability	8.9	Substance abuse	7.8
Attitudes	3.9	Substance abuse	6.2	Employability	5.5
Free time	2.9	Family	3.6	Family	4.7
Family	1.6	Free time	2.4	Free time	2.5
Mental Health	0.1	Mental Health	0.4	Mental Health	0.5
Panel B: Youth with Co-Occurring Mental Health and Substance abuse Issues					
Top Need Domain	%	**Second Highest Need**	**%**	**Third Highest Need**	**%**
Employability	38.5	Relationships	23.0	Attitudes	21.5
Relationships	16.3	School	15.3	Aggression	18.0
Social Skills	14.8	Social Skills	13.2	Relationships	15.3
Aggression	8.7	Attitudes	12.9	School	13.8
School	7.2	Aggression	12.7	Social Skills	10.8
Substance abuse	4.5	Employability	9.7	Substance abuse	8.6
Attitudes	4.1	Substance abuse	6.8	Employability	5.2
Free time	3.1	Family	4.0	Family	4.4
Family	2.5	Free time	2.0	Free time	2.1
Mental Health	0.3	Mental Health	0.4	Mental Health	0.3

Table 5 examines treatment provision between youth with and without co-occurring MH and SU issues. Both groups evidenced high percentages of treatment matching one of their top three needs (89.8% and 89.3%, respectively), indicating a broad alignment of treatment programs with the identified needs. Similar percentages were also observed in treatment matching the top need, with 40.3% for the not co-occurring group and 40.8% for the co-occurring MH & SU group, suggesting

that key criminogenic needs are being addressed at nearly equal rates regardless of the presence of co-occurring MH and SU issues.

Table 5: Treatment Provision by Presence of Co-Occurring Mental Health and Substance Use Issues

	Not Co-Occurring	Co-Occurring MH & SU	Chi-Square
TX Matches Top 3 Need			
No	10.2%	10.8%	$X^2 = 0.31$, $p > .05$
Yes	89.8%	89.3%	
TX Matches Top Need			
No	59.7%	59.2%	$X^2 = 0.69$, $p > .05$
Yes	40.3%	40.8%	
Hit SPEP Target Hours			
No	15.0%	17.2%	$X^2 = 3.00$, $p > .05$
Yes	85.0%	82.8%	
Hit SPEP Target Weeks			
No	23.7%	27.9%	$X^2 = 8.16$, $p < .01$
Yes	76.3%	72.0%	
Hit SPEP Weeks & Hours			
No	29.2%	36.6%	$X^2 = 11.92$, $p < .01$
Yes	70.8%	65.4%	
TX Quality at or Above Median			
No	49.1%	45.6%	$X^2 = 4.24$, $p < .05$
Yes	50.9%	54.4%	

In terms of dosage, results suggest a majority of both groups met the SPEP target hours, though a slightly higher percentage of the not co-occurring group (85.0%) achieved this compared to the co-occurring MH & SU group (82.8%). This difference was not statistically significant, however. Regarding SPEP target weeks, 76.3% of the comparison group and 72.0% of the youth with co-occurring issues received treatment for the recommended number of weeks. This difference, along with the difference in the proportion of youth who received treatment for both the recommended number of hours and weeks (70.8% vs 65.4%) was statistically significant, suggesting youth without co-occurring disorders are more likely to receive appropriate dosage (weeks and hours of face-to-face treatment). Finally, when assessing treatment quality, 50.9% of the comparison group received

treatment that was at or above the median quality, while 54.4% of the youth with co-occurring issues did, indicating a slightly better quality of treatment provision for the co-occurring MH & SU group.

Table 6: Change in Risk During Placement by Presence of Co-Occurring Mental Health and Substance Use Issues

	Not Co-Occurring % Change (Exit - Initial)	**Co-Occurring MH & SU** % Change (Exit - Initial)	**T-Test**
3B-Current School Status	-15.0%	-16.8%	T = 3.2, $p < .001$
3D-Current Vocational Status	-2.5%	-2.5%	T = 0.002, $p > .05$
4B-Current Use of Free Time	-4.8%	-5.1%	T = 0.49, $p > .05$
5B-Employability	-24.8%	-26.2%	T = 1.2, $p > .05$
5D-Supervised Tasks	-3.8%	-4.9%	T =1.86, $p > .05$
6B-Current Peer Relationships	-19.1%	-24.0%	T = 6.6, $p < .001$
7B-Current Family Relationships	-1.3%	-1.9%	T = 3.5, $p < .001$
8B-Current Alcohol and Drugs	-8.4%	-12.0%	T = 7.6, $p < .001$
9B-Current Mental Health	-0.4%	-0.8%	T = 2.7, $p < .01$
10-Attitudes / Behaviors	-16.2%	-19.8%	T = 6.3, $p < .001$
11-Current Aggression	-14.3%	-18.2%	T = 6.1, $p < .001$
12-Current Skills	-24.1%	-25.4%	T = 1.49, $p > .05$
12A-Skills for Dealing with Others	-20.1%	-20.4%	T = 0.43, $p > .05$
12B-Skills Dealing with Difficult Situations	-23.5%	-25.3%	T = 1.9, $p > .05$
12C-Dealing with Feelings/Emotions	-24.3%	-26.6%	T = 2.4, $p < .05$
12D-Controlling Impulsive Behavior	-25.8%	-27.0%	T = 1.2, $p > .05$
12E-Controlling Aggression	-20.0%	-21.1%	T = 1.2, $p > .05$

Table 6 presents bivariate statistics related to changes in dynamic risk during placement for both groups across domains captured in the R-PACT. The percentages displayed represent the percent change in dynamic risk within each domain that occurred between program entry and exit. Results indicate that youth with co-occurring MH and SU issues evidenced larger reductions in dynamic risk across domains, including: Current School Status, Peer Relationships, Family Relationships, Alcohol and Drug Use, Mental Health, Attitudes and Behaviors, and Aggression. Across the other domains listed, the reductions in dynamic risk were substantively similar. Overall,

across all domains, youth with co-occurring MH and SU issues evidenced equivalent, if not greater, reductions in dynamic risk.

The results in Table 7 tell a similar, if not more promising, story in terms of increases in protective factors during residential placement. With the exception of Current Vocational Status, Employability, and Skills for Dealing with Others, youth with co-occurring MH and SU issues evidenced greater increases in protective factors across domains.

Table 7: Change in Protective Factors During Placement by Presence of Co-Occurring Mental Health and Substance Use Issues

	Not Co-Occurring % Change (Exit - Initial)	**Co-Occurring MH & SU** % Change (Exit - Initial)	**T-Test**
3B-Current School Status	24.5%	26.9%	T = -2.86, $p < .01$
3D-Current Vocational Status	10.6%	11.3%	T = -0.81, $p > .05$
4B-Current Use of Free Time	32.9%	38.9%	T = -4.62, $p < .001$
5B-Employability	24.0%	25.8%	T = -1.83, $p > .05$
5D-Supervised Tasks	23.3%	26.5%	T = -3.16, $p < .01$
6B-Current Peer Relationships	20.1%	22.7%	T = -4.17, $p < .001$
7B-Current Family Relationships	22.3%	23.8%	T = -3.45, $p < .01$
8B-Current Alcohol and Drugs	40.8%	49.0%	T = -10.17, $p < .001$
9B-Current Mental Health	33.8%	38.1%	T = -5.75, $p < .001$
10-Attitudes / Behaviors	37.0%	42.8%	T = -6.47, $p < .001$
11-Current Aggression	41.3%	47.7%	T = -6.18, $p < .001$
12-Current Skills	33.0%	35.5%	T = -3.33, $p < .01$
12A-Skills for Dealing with Others	36.9%	39.3%	T = -2.48, $p < .05$
12B-Skills Dealing with Difficult Situation	37.5%	40.5%	T = -2.78, $p < .01$
12C-Dealing with Feelings/Emotions	37.8%	41.4%	T = -3.45, $p < .01$
12D-Controlling Impulsive Behavior	39.8%	42.8%	T = -2.77, $p < .01$
12E-Controlling Aggression	37.4%	40.4%	T = -2.90, $p < .01$

Table 8: Change in Risk and Protective Factors by Treatment Matching: Full Sample of Youth

Panel A: Change in Risk

	TX Not Matched	TX Matched to Top Need	Significant Differences?
	% Change (Exit - Initial)	% Change (Exit - Initial)	
3B-Current School Status	-15.0%	-16.8%	Yes; $p < .001$
3D-Current Vocational Status	-2.5%	-2.5%	No; $p > .05$
4B-Current Use of Free Time	-4.8%	-5.1%	No; $p > .05$
5B-Employability	-24.8%	-26.2%	No; $p > .05$
5D-Supervised Tasks	-3.8%	-4.9%	No; $p > .05$
6B-Current Peer Relationships	-19.1%	-24.0%	Yes; $p < .001$
7B-Current Family Relationships	-1.3%	-1.9%	Yes; $p < .001$
8B-Current Alcohol and Drugs	-8.4%	-12.0%	Yes; $p < .001$
9B-Current Mental Health	-0.4%	-0.8%	Yes; $p < .01$
10-Attitudes / Behaviors	-16.2%	-19.7%	Yes; $p < .001$
11-Current Aggression	-14.3%	-18.2%	Yes; $p < .001$
12-Current Skills	-24.1%	-24.4%	No; $p > .05$
12A-Skills for Dealing with Others	-20.1%	-20.4%	No; $p > .05$
12B-Skills Dealing Difficult Situations	-23.5%	-25.3%	Yes; $p < .05$
12C-Dealing with Feelings/Emotions	-24.4%	-26.6%	Yes; $p < .01$
12D-Controlling Impulsive Behavior	-25.8%	-27.0%	No; $p > .05$
12E-Controlling Aggression	-20.0%	-21.1%	No; $p > .05$

Panel B: Change in Protective Factors

	TX Not Matched	TX Matched to Top Need	Significant Differences?
	% Change (Exit - Initial)	% Change (Exit - Initial)	
3B-Current School Status	24.5%	26.9%	Yes; $p < .01$
3D-Current Vocational Status	10.6%	11.3%	No; $p > .05$
4B-Current Use of Free Time	32.9%	38.9%	Yes; $p < .001$
5B-Employability	24.0%	25.8%	No; $p > .05$
5D-Supervised Tasks	23.3%	26.5%	Yes; $p < .001$
6B-Current Peer Relationships	20.1%	22.7%	Yes; $p < .001$
7B-Current Family Relationships	22.2%	23.4%	Yes; $p < .001$
8B-Current Alcohol and Drugs	40.7%	49.0%	Yes; $p < .001$
9B-Current Mental Health	33.8%	38.1%	Yes; $p < .001$
10-Attitudes / Behaviors	37.0%	42.8%	Yes; $p < .001$
11-Current Aggression	41.3%	47.7%	Yes; $p < .001$
12-Current Skills	33.0%	35.5%	Yes; $p < .001$
12A-Skills for Dealing with Others	36.8%	39.3%	Yes; $p < .01$
12B-Skills Dealing Difficult Situations	37.5%	40.5%	Yes; $p < .01$
12C-Dealing with Feelings/Emotions	37.8%	41.4%	Yes; $p < .001$
12D-Controlling Impulsive Behavior	39.8%	42.8%	Yes; $p < .01$
12E-Controlling Aggression	39.4%	40.4%	Yes; $p < .01$

Note: Differences assessed using a difference-in-means T-Test

Full Sample: Changes in Risk by Treatment Components (Bivariate)

Table 8 shifts our focus to the association between treatment matching and reductions in risk /increases in protective factors across domains. The results presented in Table 8 include the full sample of youth who completed a residential placement during the period under study. The comparison being made is between the youth who had a treatment that was appropriately matched to one of their top 3 criminogenic needs and those who did not. In terms of risk, youth who received a matched treatment evidenced larger reductions in risk across a number of domains, including: Current School Status, Peer Relationships, Family Relations, Drug and Alcohol Use, Mental Health, Attitudes and Behaviors, Current Aggression, and Skills for Dealing with Feelings/Emotions. Similarly, those youth who received matched treatment evidenced larger increases in protective scores across all domains except for Current Vocational Status and Employability. Overall, the results in Table 8 suggest that treatment matching contributes to greater improvement across many of the measured domains.

Table 9 presents a similar look at changes in dynamic factors during placement based on receiving the recommended dosage (weeks and hours) of a given treatment or not. Here it is striking that there are very few significant differences between the groups. In terms of reductions in risk, youth who received the recommended treatment dosage saw greater reductions in risk related to Current School Status, Use of Free Time, and Current Skills. The differences observed between the groups were non-significant across all other domains examined.

Table 9: Change in Risk and Protective Factors by Treatment Dosage: Full Sample of Youth

Panel A: Change in Risk

	Not Recommended TX Dosage % Change (Exit - Initial)	Recommended TX Dosage % Change (Exit - Initial)	Significant Differences?
3B-Current School Status	-14.3%	-15.8%	Yes; $p < .01$
3D-Current Vocational Status	-2.5%	-2.4%	No; $p > .05$
4B-Current Use of Free Time	-3.8%	-5.3%	Yes; $p < .01$
5B-Employability	-25.7%	-24.8%	No; $p > .05$
5D-Supervised Tasks	-3.6%	-4.2%	No; $p > .05$
6B-Current Peer Relationships	-19.7%	-20.2%	No; $p > .05$
7B-Current Family Relationships	-1.4%	-1.4%	No; $p > .05$
8B-Current Alcohol and Drugs	-9.6%	-8.9%	No; $p > .05$
9B-Current Mental Health	-0.4%	-0.5%	No; $p > .05$
10-Attitudes / Behaviors	-16.6%	-17.0%	No; $p > .05$
11-Current Aggression	-15.0%	-15.1%	No; $p > .05$
12-Current Skills	-24.1%	-24.9%	Yes; $p < .05$
12A-Skills for Dealing with Others	-20.4%	-20.1%	No; $p > .05$
12B-Skills Dealing Difficult Situations	-23.1%	-24.2%	No; $p > .05$
12C-Dealing with Feelings/Emotions	-24.7%	-24.8%	No; $p > .05$
12D-Controlling Impulsive Behavior	-25.7%	-26.2%	No; $p > .05$
12E-Controlling Aggression	-19.3%	-20.6%	No; $p > .05$

Panel B: Change in Protective Factors

	Not Recommended TX Dosage % Change (Exit - Initial)	Recommended TX Dosage % Change (Exit - Initial)	Significant Differences?
3B-Current School Status	25.0%	24.9%	No; $p > .05$
3D-Current Vocational Status	12.5%	10.0%	Yes; $p < .001$
4B-Current Use of Free Time	34.3%	33.9%	No; $p > .05$
5B-Employability	24.3%	24.4%	No; $p > .05$
5D-Supervised Tasks	24.7%	23.6%	No; $p > .05$
6B-Current Peer Relationships	21.1%	20.4%	No; $p > .05$
7B-Current Family Relationships	22.5%	22.6%	No; $p > .05$
8B-Current Alcohol and Drugs	43.3%	41.9%	Yes; $p < .05$
9B-Current Mental Health	35.1%	34.4%	No; $p > .05$
10-Attitudes / Behaviors	38.6%	37.9%	No; $p > .05$
11-Current Aggression	42.6%	42.5%	No; $p > .05$
12-Current Skills	34.5%	33.1%	Yes; $p < .05$
12A-Skills for Dealing with Others	38.7%	36.7%	Yes; $p < .05$
12B-Skills Dealing Difficult Situation	38.9%	37.8%	No; $p > .05$
12C-Dealing with Feelings/Emotions	39.5%	38.0%	No; $p > .05$
12D-Controlling Impulsive Behavior	41.8%	39.7%	Yes; $p < .05$
12E-Controlling Aggression	38.9%	37.6%	No; $p > .05$

Note: Differences assessed using a difference-in-means T-Test. Recommended dosage includes both recommended hours and weeks of treatment.

What is more unexpected is that youth who received treatment at adequate dosages evidenced smaller increases in protective scores across several domains when compared to youth

who received treatment below the recommended number of hours and weeks. Specifically, across five domains, including 1) Vocational Status, 2) Alcohol and Drug use, 3) Skills, 4) Dealing with Others, and 5) Controlling Impulsive Behavior, youth who received adequate dosage evidenced smaller increases in protective scores than youth who did not. Importantly, however, these results do not control for other critical features, including the level of initial risk (as youth with high risk/low protective scores likely to have more room to "move" during the course of placement).

Table 10: Change in Risk and Protective Factors by Treatment Quality among the Full Sample of Youth

Panel A: Change in Risk

	Below Median Quality TX % Change (Exit - Initial)	**High-Quality TX** % Change (Exit - Initial)	**Significant Differences?**
3B-Current School Status	-15.6%	-15.1%	No; $p > .05$
3D-Current Vocational Status	-2.6%	-2.3%	No; $p > .05$
4B-Current Use of Free Time	-5.4%	-4.3%	Yes; $p < .05$
5B-Employability	-23.9%	-26.2%	Yes; $p < .05$
5D-Supervised Tasks	-3.4%	-4.6%	Yes; $p < .01$
6B-Current Peer Relationships	-20.3%	-19.8%	No; $p > .05$
7B-Current Family Relationships	-1.3%	-1.4%	No; $p > .05$
8B-Current Alcohol and Drugs	-9.3%	-8.9%	No; $p > .05$
9B-Current Mental Health	-0.4%	-0.5%	No; $p > .05$
10-Attitudes / Behaviors	-17.0%	-16.8%	No; $p > .05$
11-Current Aggression	-14.7%	-15.4%	No; $p > .05$
12-Current Skills	-24.3%	-24.5%	No; $p > .05$
12A-Skills for Dealing with Others	-21.4%	-19.0%	Yes; $p < .001$
12B-Skills Dealing with Difficult Situations	-24.6%	-23.2%	No; $p > .05$
12C-Dealing with Feelings/Emotions	-25.2%	-24.4%	No; $p > .05$
12D-Controlling Impulsive Behavior	-26.8%	-25.3%	No; $p > .05$
12E-Controlling Aggression	-21.4%	-19.1%	Yes; $p < .01$

Panel B: Change in Protective Factors

	Below Median Quality TX % Change (Exit - Initial)	High-Quality TX % Change (Exit - Initial)	Significant Differences?
3B-Current School Status	25.4%	24.5%	No; $p > .05$
3D-Current Vocational Status	10.8%	10.6%	No; $p > .05$
4B-Current Use of Free Time	34.6%	33.5%	No; $p > .05$
5B-Employability	24.1%	24.6%	No; $p > .05$
5D-Supervised Tasks	25.3%	22.6%	Yes; $p < .001$
6B-Current Peer Relationships	20.7%	20.4%	No; $p > .05$
7B-Current Family Relationships	22.7%	22.5%	No; $p > .05$
8B-Current Alcohol and Drugs	43.7%	41.0%	Yes; $p < .001$
9B-Current Mental Health	33.3%	35.9%	Yes; $p < .001$
10-Attitudes / Behaviors	38.6%	37.6%	No; $p > .05$
11-Current Aggression	42.4%	42.6%	No; $p > .05$
12-Current Skills	34.8%	32.3%	Yes; $p < .001$
12A-Skills for Dealing with Others	40.2%	34.7%	Yes; $p < .001$
12B-Skills Dealing with Difficult Situations	41.0%	35.3%	Yes; $p < .001$
12C-Dealing with Feelings/Emotions	41.1%	36.0%	Yes; $p < .001$
12D-Controlling Impulsive Behavior	43.2%	37.7%	Yes; $p < .001$
12E-Controlling Aggression	40.8%	35.2%	Yes; $p < .01$

Note: Differences assessed using a difference-in-means T-Test

Finally, for the full sample, Table 10 examines the domain-specific changes in risk and protective scores based on the quality of the treatment received. Given relatively little variation in the treatment quality scores provided by FDJJ, we assessed these differences for two groups based on whether they received treatment that was below the median treatment quality or at or above the median treatment quality (8.5 out of a possible 10 points). In terms of changes in risk, the results are

somewhat mixed. While the majority of the differences observed were not statistically significant, youth who received high-quality treatment saw larger reductions in risk related to Employability compared to those who received treatment of lower quality (-26.2% vs -23.9%, respectively). However, youth who received high-quality treatment evidenced smaller reductions in risk across a number of domains when compared to those who received treatment of a lesser quality. Although substantively small, reductions in the domains of Use of Free Time, Supervised Tasks, Dealing with Others, and Controlling Aggression were smaller among the group that received treatment of higher quality.

Results tell a similar story when it comes to changes in protective factors across treatment quality, although more are statistically different in the unexpected direction. Only in the domain of Mental Health did those who received high-quality treatment evidence larger increases in their protective score than youth who did not. Across several domains, the increases observed were smaller among the high-quality group, including: Supervised Tasks, Alcohol and Drug Use, Current Skills, Dealing with Others, Dealing with Difficult Situations, Dealing with Feelings/Emotions, Controlling Impulsive Behavior, and Controlling Aggression. Again, however, these results do not control for other critical features, including the level of initial risk, which will be examined in a multivariate context in later parts of the analysis presented.

Co-Occurring Sub-Sample: Changes in Risk by Treatment Components (Bivariate)

Tables 11-13 present a similar set of analyses for the youth who suffer from co-occurring MH and SU issues. Table 11 assesses the association between treatment matching and changes in risk/protective scores during placement among this group. As with the full sample, treatment matching was associated with larger reductions in dynamic risk across a number of domains. For example, youth with co-occurring MH and SU issues who received a matched treatment saw

significantly larger reductions in risk associated with Current Peer Relationships in comparison to comorbid youth who did not receive a matched treatment (-25.1% vs -14.3%). More substantial reductions were observed across several other domains, including: Attitudes/Behaviors, Skills, Current Aggression, Dealing with Others, Dealing with Difficult Situations, Dealing with Feelings and Emotions, Controlling Impulsive Behavior, and Controlling Aggression.

When it came to enhancements in protective factors, comorbid youth who received treatment tailored to their needs showed greater improvements across the following domains: 1) Peer Relationships, 2) Attitudes/Behaviors, 3) Current Aggression, 4) Skills, and 5) Controlling Aggression. Only changes in one domain went against this trend, with comorbid youth who received a matched treatment evidencing smaller increases in the domain of Supervised Tasks, as compared to youth who did not (25.8% vs 32.7%).

Table 11: Change in Risk and Protective Factors by Treatment Matching among Comorbid Youth (n = 1,042)

Panel A: Change in Risk

	TX Not Matched % Change (Exit - Initial)	**TX Matched to Top Need** % Change (Exit - Initial)	**Significant Differences?**
3B-Current School Status	-16.3%	-16.9%	No; $p > .05$
3D-Current Vocational Status	-1.6%	-2.6%	No; $p > .05$
4B-Current Use of Free Time	-6.3%	-4.9%	No; $p > .05$
5B-Employability	-33.4%	-22.4%	Yes; $p < .05$
5D-Supervised Tasks	-4.5%	-5.0%	No; $p > .05$
6B-Current Peer Relationships	-14.3%	-25.1%	Yes; $p < .001$
7B-Current Family Relationships	-1.9%	-1.9%	No; $p > .05$
8B-Current Alcohol and Drugs	-14.5%	-11.7%	Yes; $p < .05$
9B-Current Mental Health	-1.0%	-0.8%	No; $p > .05$
10-Attitudes / Behaviors	-12.6%	-20.6%	Yes; $p < .001$
11-Current Aggression	-14.7%	-18.7%	Yes; $p < .05$
12-Current Skills	-10.8%	-27.2%	Yes; $p < .001$
12A-Skills for Dealing with Others	-16.0%	-21.0%	Yes; $p < .05$
12B-Skills Dealing Difficult Situations	-18.5%	-26.1%	Yes; $p < .01$
12C-Dealing with Feelings/Emotions	-21.0%	-27.3%	Yes; $p < .05$
12D-Controlling Impulsive Behavior	-20.8%	-27.8%	Yes; $p < .05$
12E-Controlling Aggression	-16.0%	-21.7%	Yes; $p < .05$

Panel B: Change in Protective Factors			
	TX Not Matched % Change (Exit - Initial)	**TX Matched to Top Need** % Change (Exit - Initial)	**Significant Differences?**
3B-Current School Status	25.3%	27.1%	No; p > .05
3D-Current Vocational Status	8.0%	11.7%	No; p > .05
4B-Current Use of Free Time	33.9%	39.5%	No; p > .05
5B-Employability	27.2%	25.6%	No; p > .05
5D-Supervised Tasks	32.7%	25.8%	Yes; p < .05
6B-Current Peer Relationships	18.2%	23.2%	Yes; p < .01
7B-Current Family Relationships	23.8%	23.8%	No; p > .05
8B-Current Alcohol and Drugs	51.4%	48.7%	No; p > .05
9B-Current Mental Health	39.8%	37.9%	No; p > .05
10-Attitudes / Behaviors	34.9%	43.8%	Yes; p < .05
11-Current Aggression	42.1%	48.4%	Yes; p < .05
12-Current Skills	29.9%	36.2%	Yes; p < .01
12A-Skills for Dealing with Others	34.9%	39.3%	No; p > .05
12B-Skills Dealing Difficult Situations	38.4%	40.7%	No; p > .05
12C-Dealing with Feelings/Emotions	39.0%	41.7%	No; p > .05
12D-Controlling Impulsive Behavior	39.0%	43.3%	No; p > .05
12E-Controlling Aggression	35.4%	41.0%	Yes; p < .05

Note: Differences assessed using a difference-in-means T-Test

There are far fewer significant differences observed when assessing the association between appropriate treatment dosage and changes in risk/protective scores among youth with co-occurring MH and SU issues (shown in Table 12). In terms of risk, the only significant difference was observed in the domain of Current School Status, with comorbid youth who received adequate treatment dosage evidencing larger reduction in dynamic risk in the domain of Current School Status as compared to those who did not (-17.7% vs 15.2%). Again, however, when it came to protective factors, dosage was negatively related to increases in protective scores related to Current Mental Health (37.1% vs 40.0%) and Skills for Dealing with Others (37.8% vs 42.1%), contrary to expectations.

Table 12: Change in Risk and Protective Factors by Treatment Matching: Comorbid Youth (n = 1,042)

Panel A: Change in Risk

	Not Recommended Dosage % Change (Exit - Initial)	Recommended TX Dosage % Change (Exit - Initial)	Significant Differences?
3B-Current School Status	-15.2%	-17.7%	Yes; p < .05
3D-Current Vocational Status	-2.4%	-2.5%	No; p > .05
4B-Current Use of Free Time	-4.2%	-5.6%	No; p > .05
5B-Employability	-26.7%	-26.0%	No; p > .05
5D-Supervised Tasks	-4.2%	-5.3%	No; p > .05
6B-Current Peer Relationships	-22.6%	-24.6%	No; p > .05
7B-Current Family Relationships	-2.0%	-1.8%	No; p > .05
8B-Current Alcohol and Drugs	-12.6%	-11.6%	No; p > .05
9B-Current Mental Health	-0.5%	-0.9%	No; p > .05
10-Attitudes / Behaviors	-19.4%	-19.9%	No; p > .05
11-Current Aggression	-18.4%	-18.2%	No; p > .05
12-Current Skills	-24.1%	-26.1%	No; p > .05
12A-Skills for Dealing with Others	-20.8%	-20.2%	No; p > .05
12B-Skills Dealing with Difficult Situations	-24.3%	-25.9%	No; p > .05
12C-Dealing with Feelings/Emotions	-26.6%	-26.6%	No; p > .05
12D-Controlling Impulsive Behavior	-26.5%	-27.4%	No; p > .05
12E-Controlling Aggression	-20.1%	-21.6%	No; p > .05

Panel B: Change in Protective Factors

	Not Recommended Dosage % Change (Exit - Initial)	Recommended TX Dosage % Change (Exit - Initial)	Significant Differences?
3B-Current School Status	27.0%	26.8%	No; p > .05
3D-Current Vocational Status	12.2%	10.8%	No; p > .05
4B-Current Use of Free Time	39.5%	38.6%	No; p > .05
5B-Employability	25.8%	25.8%	No; p > .05
5D-Supervised Tasks	30.6%	24.3%	Yes; p < .01
6B-Current Peer Relationships	21.9%	23.1%	No; p > .05
7B-Current Family Relationships	24.6%	23.4%	No; p > .05
8B-Current Alcohol and Drugs	50.5%	48.3%	No; p > .05
9B-Current Mental Health	40.0%	37.1%	Yes; p < .05
10-Attitudes / Behaviors	43.2%	42.6%	No; p > .05
11-Current Aggression	47.6%	47.8%	No; p > .05
12-Current Skills	36.7%	34.9%	No; p > .05
12A-Skills for Dealing with Others	42.1%	37.8%	Yes; p < .05
12B-Skills Dealing with Difficult Situations	41.6%	39.9%	No; p > .05
12C-Dealing with Feelings/Emotions	42.8%	40.7%	No; p > .05
12D-Controlling Impulsive Behavior	44.2%	42.1%	No; p > .05
12E-Controlling Aggression	41.6%	39.7%	No; p > .05

Note: Differences assessed using a difference-in-means T-Test. Recommended dosage includes both recommended hours and weeks of treatment.

Table 13: Change in Risk and Protective Factors by Treatment Quality: Comorbid Youth (n = 1,042)

Panel A: Change in Risk

	Below Median Quality TX	High-Quality TX	Significant Differences?
	% Change (Exit - Initial)	% Change (Exit - Initial)	
3B-Current School Status	-16.7%	-17.0%	No; p > .05
3D-Current Vocational Status	-1.6%	-3.2%	Yes; p < .01
4B-Current Use of Free Time	-6.2%	-4.2%	No; p > .05
5B-Employability	-27.8%	-24.9%	No; p > .05
5D-Supervised Tasks	-3.2%	-6.3%	Yes; p < .01
6B-Current Peer Relationships	-24.6%	-23.4%	No; p > .05
7B-Current Family Relationships	-1.9%	-1.9%	No; p > .05
8B-Current Alcohol and Drugs	-12.1%	-11.8%	No; p > .05
9B-Current Mental Health	-0.7%	-0.9%	No; p > .05
10-Attitudes / Behaviors	-19.8%	-19.7%	No; p > .05
11-Current Aggression	-18.7%	-17.9%	No; p > .05
12-Current Skills	-225.8%	-25.1%	No; p > .05
12A-Skills for Dealing with Others	-21.2%	-19.9%	No; p > .05
12B-Skills Dealing Difficult Situations	-25.5%	-25.1%	No; p > .05
12C-Dealing with Feelings/Emotions	-26.6%	-26.5%	No; p > .05
12D-Controlling Impulsive Behavior	-27.7%	-26.5%	No; p > .05
12E-Controlling Aggression	-21.8%	-20.4%	No; p > .05

Panel B: Change in Protective Factors

	Below Median Quality TX	High-Quality TX	Significant Differences?
	% Change (Exit - Initial)	% Change (Exit - Initial)	
3B-Current School Status	26.9%	26.9%	No; p > .05
3D-Current Vocational Status	12.8%	10.0%	No; p > .05
4B-Current Use of Free Time	38.6%	39.2%	No; p > .05
5B-Employability	27.3%	24.4%	No; p > .05
5D-Supervised Tasks	27.7%	25.5%	No; p > .05
6B-Current Peer Relationships	22.0%	23.2%	No; p > .05
7B-Current Family Relationships	24.1%	23.6%	No; p > .05
8B-Current Alcohol and Drugs	51.1%	47.3%	Yes; p < .01
9B-Current Mental Health	37.8%	38.4%	No; p > .05
10-Attitudes / Behaviors	42.9%	42.7%	No; p > .05
11-Current Aggression	48.4%	47.2%	No; p > .05
12-Current Skills	37.2%	34.1%	Yes; p < .05
12A-Skills for Dealing with Others	42.2%	36.9%	Yes; p < .01
12B-Skills Dealing Difficult Situations	43.1%	38.3%	Yes; p < .01
12C-Dealing with Feelings/Emotions	44.3%	38.9%	Yes; p < .01
12D-Controlling Impulsive Behavior	46.1%	40.0%	Yes; p < .01
12E-Controlling Aggression	43.5%	37.8%	Yes; p < .01

Note: Differences assessed using a difference-in-means T-Test

Similar to the results related to treatment dosage, results related to treatment quality highlight relatively few differences in the reduction of dynamic risk among the group of youth with co-occurring MH and SU issues (shown in Table 13). While the vast majority of differences were not statistically significant. Comorbid youth who received high-quality treatment saw larger reductions in the domains of Current Vocational Status (-3.2% vs -1.6%) and Supervised Tasks (-6.3% vs -3.2%), although it is important to highlight that these reductions were substantively small in nature. Table 13 also compares the change in domain-specific protective scores between youth who received a treatment of high quality or not. Here again, the results are opposite of what may be expected with larger changes observed among comorbid youth who received treatment which fell below the median in treatment quality. These differences are substantively larger than those differences present among risk factors, and they were statistically significant across seven domains, namely: Alcohol and Drug Use, Current Skills, Dealing with Others, Dealing with Difficult Situations, Dealing with Feelings/Emotions, Controlling Impulsive Behavior, and Controlling Aggression.

Multivariate Results: Changes in Risk and Protective Factors

Next, we examined the association between our treatment variables and changes in dynamic risk and protective risk factors using a series of multivariate (OLS) models. Although presented in summary form, each table represents a total of thirty-four models (17 for risk and 17 for protective). In each model, we control for a number of variables that may be associated with changes in dynamic risk and protective scores. Most important is accounting for the initial level of risk/protection, along with demographic characteristics (age, sex, and race/ethnicity) as well as length of stay and a fixed-effect for each program and each year examined. Using this approach allows us to more confidently

assess whether differences in changes in dynamic risk and dynamic protective factors are associated with treatment characteristics than simple bivariate tests alone.

Table 14: Multivariate Change in Risk and Protective Factors by Treatment Matching, Dosage and Quality among the Full Sample of Youth

	Change in Risk						Change in Protective Factors					
	Treatment Matching		Dosage		Treatment Quality		Treatment Matching		Dosage		Treatment Quality	
3B-Current School Status	+	n.s.	-	n.s.	-	n.s.	-	n.s.	-	*	+	n.s.
3D-Current Vocational Status	-	n.s.	+	n.s.	-	n.s.	-	n.s.	-	n.s.	+	n.s.
4B-Current Use of Free Time	+	n.s.	-	n.s.	+	n.s.	+	n.s.	-	n.s.	-	n.s.
5B-Employability	+	n.s.	+	n.s.	+	*	-	n.s.	-	n.s.	-	n.s.
5D-Supervised Tasks	+	n.s.	+	n.s.	+	n.s.	-	n.s.	-	n.s.	-	n.s.
6B-Current Peer Relationships	+	n.s.	+	*	+	*	+	n.s.	-	*	-	n.s.
7B-Current Family Relationships	-	n.s.	+	n.s.	+	n.s.	+	n.s.	+	n.s.	-	n.s.
8B-Current Alcohol and Drugs	+	n.s.	+	n.s.	+	n.s.	-	n.s.	-	n.s.	-	*
9B-Current Mental Health	+	n.s.	-	n.s.	+	n.s.	+	n.s.	+	n.s.	-	n.s.
10-Attitudes / Behaviors	-	n.s.	+	n.s.	+	**	+	n.s.	-	n.s.	-	**
11-Current Aggression	+	n.s.	+	*	+	n.s.	+	n.s.	-	n.s.	-	n.s.
12-Current Skills	-	n.s.	-	n.s.	+	n.s.	-	n.s.	-	n.s.	-	**
12A-Skills for Dealing with Others	-	n.s.	+	n.s.	+	n.s.	+	n.s.	-	n.s.	-	**
12B-Skills Dealing with Difficult Situations	-	n.s.	+	n.s.	+	n.s.	-	n.s.	-	n.s.	-	n.s.
12C-Dealing with Feelings/Emotions	-	n.s.	+	n.s.	+	n.s.	-	n.s.	-	n.s.	-	*
12D-Controlling Impulsive Behavior	-	n.s.	+	n.s.	+	*	-	n.s.	-	n.s.	-	**
12E-Controlling Aggression	-	n.s.	+	n.s.	+	n.s.	+	n.s.	-	*	-	**

Note: All models control for age, race/ethnicity, initial risk in focal domain, length of stay and a fixed effect of each program and each fiscal year. Clustered standard errors computed to account for nesting of youth within programs. N.S. = $p > .05$, * $p < .05$, ** $p < .01$ *** $p < .001$.

Table 14 presents the results for the full sample of youth who served a residential placement during this period. We see that once other factors are controlled for, treatment matching is not significantly related to changes in dynamic risk across any of the domains examined. Treatment dosage, however, is associated with smaller reductions in risk in the domains of Peer Relationships and Aggression. Receiving high-quality treatment was also associated with smaller reductions in risk in four domains, specifically: 1) Employability, 2) Peer Relationships, 3) Attitudes/Behaviors, and 4) Controlling Impulsive Behavior. Results are similar among the protective factors, although perhaps more discouraging. Youth who received treatment at the recommended dosage evidenced smaller increases in protective scores related to Peer Relationships and Controlling Aggression. Similarly, receiving treatment of higher quality was associated with smaller increases in domain-specific protective scores in several domains, including: Alcohol and Drugs, Attitudes/Behaviors, Skills, Dealing with Feelings/Emotions, Controlling Impulsive Behavior, and Controlling Aggression.

Table 15 presents the results of a similar set of multivariate models utilizing the sample of youth with co-occurring MH and SU issues. Overall, there are much fewer significant associations (most likely due to more limited statistical power to detect small effects). The only significant association uncovered between treatment matching and changes in dynamic scores was a positive (larger increases) in Current Vocational Status for comorbid youth who received a matched treatment. Similarly, there were only two significant effects related to treatment dosage, with comorbid youth who received treatment at an adequate dosage evidencing smaller increases in their protective scores in the domains of Dealing with Others, and Controlling Aggression. Finally, comorbid youth who received treatment at or above the mean of treatment quality, saw smaller increases in their protective score in the areas of Employability, Attitudes/Behaviors, and Current Skills.

Table 15: Multivariate Change in Risk and Protective Factors by Treatment Matching, Dosage and Quality among Comorbid Youth (n = 1,042).

	Change in Risk						Change in Protective Factors					
	Treatment Matching		Dosage		Treatment Quality		Treatment Matching		Dosage		Treatment Quality	
3B-Current School Status	-	n.s.	-	n.s.	+	n.s.	-	n.s.	-	n.s.	+	n.s.
3D-Current Vocational Status	+	n.s.	+	n.s.	-	n.s.	+	*	+	n.s.	+	n.s.
4B-Current Use of Free Time	+	n.s.	+	n.s.	+	n.s.	-	n.s.	+	n.s.	-	n.s.
5B-Employability	+	n.s.	-	n.s.	+	**	-	n.s.	+	n.s.	-	*
5D-Supervised Tasks	-	n.s.	+	n.s.	-	n.s.	+	n.s.	-	n.s.	-	n.s.
6B-Current Peer Relationships	-	n.s.	-	n.s.	+	n.s.	+	n.s.	+	n.s.	-	n.s.
7B-Current Family Relationships	-	n.s.	+	n.s.	+	n.s.	-	n.s.	-	n.s.	-	n.s.
8B-Current Alcohol and Drugs	+	n.s.	+	n.s.	+	n.s.	-	n.s.	+	n.s.	-	n.s.
9B-Current Mental Health	+	n.s.	-	n.s.	+	n.s.	-	n.s.	-	n.s.	+	n.s.
10-Attitudes / Behaviors	+	n.s.	+	n.s.	+	n.s.	-	n.s.	+	n.s.	-	*
11-Current Aggression	+	n.s.	+	n.s.	+	n.s.	-	n.s.	-	n.s.	-	n.s.
12-Current Skills	-	n.s.	+	n.s.	+	n.s.	-	n.s.	-	n.s.	-	**
12A-Skills for Dealing with Others	-	n.s.	+	n.s.	-	n.s.	+	n.s.	-	*	-	n.s.
12B-Skills Dealing with Difficult Situations	-	n.s.	+	n.s.	-	n.s.	-	n.s.	-	n.s.	-	n.s.
12C-Dealing with Feelings/Emotions	-	n.s.	+	n.s.	-	n.s.	-	n.s.	-	n.s.	-	n.s.
12D-Controlling Impulsive Behavior	-	n.s.	-	n.s.	-	n.s.	+	n.s.	-	n.s.	-	n.s.
12E-Controlling Aggression	-	n.s.	+	n.s.	-	n.s.	+	n.s.	-	*	-	n.s.

Note: All models control for age, race/ethnicity, initial risk in focal domain, length of stay and a fixed effect of each program and each fiscal year. Clustered standard errors computed to account for nesting of youth within programs. N.S. = $p > .05$, * $p < .05$, ** $p < .01$ *** $p < .001$.

These somewhat puzzling and/or discouraging results necessitated a closer look at the changes in dynamic factors that occurred during placement. Specifically, it became apparent that across many domains there was evidence of limited change as well as evidence that a sizeable proportion of youth witnessed no change at all when it came to individual domains of risk/protective factors.

Table 16 displays the proportion of youth who evidenced zero change in their dynamic risk/protective score in a given domain (no increase or decrease from admission to discharge). It was observed that the proportion of youth who evidenced zero change between their initial and exit assessments was substantial among many of the assessed domains, with many above 50% of the sample. While zeros were less prevalent among protective change scores, they were still substantial in a number of domains, including Vocational Status, Use of Free Time, and Supervised Tasks. This distribution prompted a second look at the multivariate results using a different strategy in which youth who experienced any reduction in risk were coded =1 and those who did not were coded =0. Similarly, youth who experienced any increase in their dynamic protective score were coded 1, where those who saw decreases or zero change were coded as 0. The models presented in Table 17 and Table 18 present the results of these logistic regression models where the dichotomous measure of change was regressed on the treatment indicators as well as previously described control variables.

Table 16: Evidence of Minimal Domain-Specific Change During Placement

	Risk	Protective
Domain Name	**% ZERO Change**	**% ZERO Change**
3B-Current School Status	22.37%	14.28%
3D-Current Vocational Status	85.60%	70.50%
4B-Current Use of Free Time	89.50%	40.00%
5B-Employability	42.60%	33.50%
5D-Supervised Tasks	85.90%	43.20%
6B-Current Peer Relationships	29.24%	16.60%
7B-Current Family Relationships	64.50%	2.45%
8B-Current Alcohol and Drugs	47.14%	10.80%
9B-Current Mental Health	94.80%	14%
10-Attitudes / Behaviors	14.57%	2.40%
11-Current Aggression	28.16%	7.28%
12-Current Skills	25.60%	2.30%
12A-Skills for Dealing with Others	32.42%	12.90%
12B-Skills Dealing with Difficult Situations	33.70%	15.36%
12C-Dealing with Feelings/Emotions	35.50%	16.86%
12D-Controlling Impulsive Behavior	38.62%	17.75%
12E-Controlling Aggression	38.30%	15.03%

Table 17: Predicting Reductions in Risk and Increases in Protective Factors by Treatment Matching, Dosage and Quality

	Reduction in Risk (1 = Yes)						Increases in Protective Factors (1 = Yes)					
	Treatment Matching		Dosage		Treatment Quality		Treatment Matching		Dosage		Treatment Quality	
3B-Current School Status	-	*	-	n.s.	+	n.s.	-	n.s.	+	n.s.	-	n.s.
3D-Current Vocational Status	+	n.s.	-	n.s.	-	n.s.	+	n.s.	-	n.s.	-	n.s.
4B-Current Use of Free Time	-	*	+	n.s.	-	n.s.	+	*	+	n.s.	-	n.s.
5B-Employability	-	n.s.	-	n.s.	+	n.s.	-	n.s.	-	n.s.	-	n.s.
5D-Supervised Tasks	+	n.s.	+	n.s.	+	n.s.	-	n.s.	-	n.s.	-	n.s.
6B-Current Peer Relationships	+	**	-	n.s.	-	n.s.	+	**	-	n.s.	+	n.s.
7B-Current Family Relationships	-	n.s.	+	n.s.	+	n.s.	+	n.s.	-	n.s.	-	n.s.
8B-Current Alcohol and Drugs	-	n.s.	-	n.s.	-	n.s.	+	n.s.	-	n.s.	-	*
9B-Current Mental Health	-	n.s.	+	n.s.	+	*	+	n.s.	-	n.s.	+	n.s.
10-Attitudes / Behaviors	+	**	-	n.s.	+	n.s.	+	**	-	n.s.	+	n.s.
11-Current Aggression	+	**	-	n.s.	+	n.s.	+	**	-	n.s.	-	n.s.
12-Current Skills	+	**	-	n.s.	+	n.s.	+	**	-	n.s.	-	n.s.
12A-Skills for Dealing with Others	+	*	-	*	-	n.s.	+	n.s.	-	n.s.	-	**
12B-Skills Dealing with Difficult Situations	+	**	-	n.s.	-	n.s.	+	*	-	n.s.	-	*
12C-Dealing with Feelings/Emotions	+	**	-	n.s.	-	n.s.	+	n.s.	-	*	-	*
12D-Controlling Impulsive Behavior	+	*	-	n.s.	-	n.s.	+	n.s.	-	n.s.	-	**
12E-Controlling Aggression	+	*	-	n.s.	-	n.s.	+	*	-	n.s.	-	**

Note: Logistic regression estimates shown. All models control for age, race/ethnicity, initial risk in focal domain, length of stay and a fixed effect of each judicial district and each fiscal year. Clustered standard errors computed to account for nesting of youth within programs. N.S. = $p > .05$, * $p < .05$, ** $p < .01$ *** $p < .001$.

Table 17 presents the results for the full sample of youth. We see that when operationalized in this way, there are more significant effects related to treatment matching (in the anticipated direction) and fewer results that go against expectations (although several still

exist). For example, youth who received an appropriately matched treatment had a higher probability of evidencing a reduction in risk and increases in their protective score in several domains. Dosage, on average, does not appear to have a substantial association with the probability of changes in risk and protective scores, although for Skills Dealing with Others, it was negatively related to the likelihood that a youth saw reductions in risk in this domain and negatively related to the likelihood they saw increases in their protective score associated with Dealing with Feelings/Emotions. While receiving a high-quality treatment increased the likelihood that youth experienced reductions in risk related to Mental Health, it was negatively related to the probability of increases in Current Alcohol and Drugs and a number of skills domains (shaded in red in Table 17).

Table 18 displays a similar set of results for the sample of youth with co-occurring MH & SU issues. Again, there are fewer significant associations, but we do see some evidence that treatment matching is associated with a greater probability of reductions in risk across the domains of Peer Relationships, Attitudes and Behaviors, Current Aggression, and Current Skills. Receiving matched treatment was negatively associated with the probability of reductions in risk in the domain of Employability, as well as negatively related to increases in protective factors in the domain of Controlling Impulsive Behavior. Results in Table 18 also suggest that comorbid youth who received treatment at the recommended dosage were less likely to see reductions in risk associated with Current Aggression, as well as increases in Skills for Dealing with Others, and Controlling Aggression. Finally, the treatment quality was negatively related to the likelihood that comorbid youth evidenced reductions in risk associated with the Use of Free Time, as well as negatively associated with probability they saw increases in their protective score associated with Drug and Alcohol Use, as well as the same social skills domains. We provide a detailed discussion of these somewhat mixed findings after presenting results related to recidivism.

Table 18: Predicting Reductions in Risk and Increases in Protective Factors by Treatment Matching, Dosage and Quality (n = 1,042).

	Reduction in Risk (1 = Yes)						Increases in Protective Factors (1 = Yes)					
	Treatment Matching		Dosage		Treatment Quality		Treatment Matching		Dosage		Treatment Quality	
3B-Current School Status	-	n.s.	+	n.s.	+	n.s.	+	n.s.	-	n.s.	+	n.s.
3D-Current Vocational Status	+	n.s.	-	n.s.	+	n.s.	+	n.s.	-	n.s.	-	n.s.
4B-Current Use of Free Time	-	n.s.	+	n.s.	-	**	+	n.s.	-	n.s.	-	n.s.
5B-Employability	-	*	+	n.s.	-	n.s.	-	n.s.	-	n.s.	-	n.s.
5D-Supervised Tasks	+	n.s.	+	n.s.	+	n.s.	-	n.s.	-	n.s.	-	n.s.
6B-Current Peer Relationships	+	**	+	n.s.	-	n.s.	+	n.s.	+	n.s.	+	n.s.
7B-Current Family Relationships	+	n.s.	+	n.s.	-	n.s.	+	n.s.	-	n.s.	+	n.s.
8B-Current Alcohol and Drugs	-	n.s.	-	n.s.	-	n.s.	-	n.s.	+	n.s.	-	**
9B-Current Mental Health	-	n.s.	+	n.s.	+	n.s.	-	n.s.	-	n.s.	+	n.s.
10-Attitudes / Behaviors	+	*	-	n.s.	+	n.s.	-	n.s.	-	n.s.	+	n.s.
11-Current Aggression	+	*	-	*	-	n.s.	+	n.s.	-	n.s.	-	n.s.
12-Current Skills	+	**	-	n.s.	+	n.s.	-	n.s.	-	n.s.	-	n.s.
12A-Skills for Dealing with Others	-	n.s.	-	n.s.	-	n.s.	-	n.s.	-	*	-	**
12B-Skills Dealing with Difficult Situations	-	n.s.	-	n.s.	-	n.s.	-	n.s.	-	n.s.	-	*
12C-Dealing with Feelings/Emotions	-	n.s.	-	n.s.	-	n.s.	-	n.s.	-	n.s.	-	*
12D-Controlling Impulsive Behavior	-	n.s.	-	n.s.	-	n.s.	-	*	-	n.s.	-	*
12E-Controlling Aggression	-	n.s.	-	n.s.	-	n.s.	-	n.s.	-	*	-	n.s.

Note: Logistic regression estimates shown. All models control for age, race/ethnicity, initial risk in focal domain, length of stay and a fixed effect of judicial district and each fiscal year. Clustered standard errors computed to account for nesting of youth within programs. N.S. = $p > .05$, * $p < .05$, ** $p < .01$ *** $p < .001$.

Multivariate Results: Recidivism

The final set of analyses to come out of this project examines the association between our treatment indicators and the incidence of juvenile recidivism. Here, we use a series of logistic regression models to account for a number of factors that are also likely to impact juvenile recidivism while examining the effect of treatment matching, dosage, and quality. Each model controls for demographic characteristics, co-occurring MH and SU issues, as well as a series of criminal history indicators and an index of total risk to recidivate at the time youth completed their placement, and length of stay. The total risk index at exit was calculated by standardizing and summing together the domain-specific risk scores taken from the assessment completed just prior to a youth's exit from the program and is believed to capture a youth's relative level of risk across all dynamic domains at time of program completion. In addition to the estimates shown, each model includes a fixed effect for each judicial district and each fiscal year in the sample in order to account for unobserved heterogeneity. All confidence intervals were computed using clustered standard errors that account for the nesting of youth within residential programs. A total of four models were estimated for each sample. The first three look at each treatment indicator separately, while the fourth looks at them all within the same model, effectively accounting for all focal dimensions of the treatment received.[4]

Table 19 presents the results of the recidivism analysis for the full sample of youth who completed a residential placement during this period. Results suggest that treatment matching was not statistically associated with the likelihood of recidivism once other factors were accounted for. This was also true of treatment quality, where no significant effects were observed.

[4] While we initially hoped to also look at time to recidivism using a series of survival models, due to changes in data FDJJ provided on recidivism offense that occur once youth become adults (i.e. absence of the offense date) made this infeasible.

Table 19: Association between Recidivism and TX Matching, Dosage and Quality among Full Sample of Youth (n = 5,469)

	Matching		Dosage		TX Quality		Full Model	
	OR	95% C.I.	OR	95% C.I.	OR	95% C.I.	OR	95% C.I.
Treatment Matching	1.090	[.914,1.300]					1.043	[.877,1.242]
Treatment Dosage			1.416***	[1.217,1.647]			1.409***	[1.211,1.640]
Treatment Quality					.928	[.826,1.043]	.937	[.831,1.058]
Psychotropic Meds	1.132*	[1.006,1.273]	1.129	[.999,1.276]	1.134*	[1.007,1.276]	1.133*	[1.003,1.281]
Co-occurring SA & MH Issues	1.090	[.955,1.244]	1.099	[.962,1.255]	1.092	[.959,1.244]	1.101	[.965,1.257]
Length of Stay	1.000	[.999,1.001]	1.000	[.999,1.000]	1.000	[.999,1.001]	1.000	[.999,1.000]
Age at release	.701***	[.669,.735]	.710***	[.675,.747]	.701***	[.668,.736]	.711***	[.676,.748]
Male	2.599***	[2.214,3.051]	2.543***	[2.111,3.063]	2.587***	[2.212,3.025]	2.543***	[2.120,3.049]
Black	1.304***	[1.156,1.471]	1.277***	[1.132,1.441]	1.309***	[1.159,1.479]	1.277***	[1.132,1.440]
Hispanic	1.009	[.859,1.184]	.988	[.848,1.152]	1.013	[.862,1.189]	.988	[.847,1.152]
Age at First Offense	1.087*	[1.005,1.175]	1.092*	[1.008,1.182]	1.088*	[1.006,1.177]	1.092*	[1.008,1.182]
Prior Misd Referrals	1.138***	[1.080,1.200]	1.137***	[1.078,1.199]	1.139***	[1.081,1.201]	1.137***	[1.078,1.200]
Prior Felony Referrals	1.206***	[1.105,1.315]	1.205***	[1.105,1.314]	1.207***	[1.105,1.317]	1.206***	[1.105,1.315]
Prior Weapon Referrals	.997	[.893,1.113]	1.002	[.897,1.119]	.999	[.894,1.116]	1.003	[.898,1.121]
Prior Violent Felonies	.916	[.816,1.028]	.919	[.816,1.034]	.920	[.818,1.035]	.924	[.821,1.040]
Prior Sex Off. Referrals	.643	[.364,1.136]	.651	[.370,1.143]	.643	[.362,1.141]	.650	[.369,1.146]
Prior Detention Stays	1.152***	[1.096,1.211]	1.150***	[1.094,1.209]	1.151***	[1.095,1.211]	1.150***	[1.094,1.209]
Prior Residential Placement	1.439***	[1.202,1.721]	1.395***	[1.157,1.682]	1.445***	[1.208,1.727]	1.397***	[1.159,1.684]
Total Risk Index at Exit	1.163*	[1.029,1.314]	1.171*	[1.037,1.323]	1.168*	[1.036,1.317]	1.168*	[1.033,1.322]
Constant	23.485***	[7.996,68.975]	18.633***	[6.118,56.751]	25.327***	[8.235,77.895]	17.477***	[6.013,50.792]

Note: Logistic regression estimates shown. All models include a fixed effect of each judicial district and each fiscal year. Clustered standard errors computed to account for nesting of youth within programs. * $p < .05$, ** $p < .01$ *** $p < .001$.

Interestingly, however, youth who received treatment at or above the recommended dosage were more likely to recidivate within one year of their release as compared to those who did not. In addition to the focal treatment variables, a number of youth characteristics were associated with recidivism, including the prescription of psychotropic medication, age, sex, and race. Not surprisingly, a number of criminal history indicators were also associated with an increased likelihood of continued offending including prior referrals, prior detention stays, prior residential placement, and higher assessed risk at time of completion.

The final table presents a similar set of results for youth with co-occurring disorders. What is most striking about the results presented in Table 20 is the lack of significant associations. While treatment dosage was positively associated with recidivism when examined alone (model 2), its association was reduced to the point of being non-significant when all other treatment indicators were included. Also notable, the vast majority of control variables included were not significantly related to the likelihood of recidivism among this sample. Only three significant results emerged. Older youth were less likely to recidivate than their younger peers, male youth were more likely to recidivate than female youth, and those youth with more prior felony referrals were more likely than youth with fewer prior felony referrals to reoffend following completion of their placement. Perhaps most surprising is the finding that levels of risk at exit were not associated with the likelihood of recidivism among this sample.

Overall results suggest that traditional factors considered in recidivism studies may not apply as strongly to comorbid youth, who may have unique needs and challenges not captured by traditional risk assessment instruments. These results emphasize the complexity of addressing recidivism among youth with co-occurring MH and SU issues. Findings underscore the necessity of a more sophisticated and tailored approach to treatment and intervention for comorbid youth within the juvenile justice system, one that goes beyond traditional measures of treatment dosage and

incorporates a deeper understanding of the individual characteristics and histories of these young people.

Table 20: Association between Recidivism and Treatment Matching, Dosage and Quality among Comorbid Youth (n = 1,042).

	Matching		Dosage		TX Quality		Full Model	
	OR	95% C.I.	OR	95% C.I.	OR	95% C.I.	OR	95% C.I.
Treatment Matching	1.376	[.955,1.983]					1.328	[.902,1.956]
Treatment Dosage			1.326*	[1.011,1.738]			1.284	[.978,1.688]
Treatment Quality					1.167	[.871,1.563]	1.178	[.876,1.583]
Psychotropic Meds	.895	[.671,1.194]	.893	[.669,1.193]	.888	[.667,1.184]	.889	[.664,1.190]
Length of Stay	1.000	[.998,1.001]	.999	[.998,1.001]	1.000	[.998,1.001]	.999	[.998,1.001]
Age at release	.754***	[.663,.858]	.768***	[.676,.872]	.748***	[.659,.851]	.766***	[.674,.871]
Male	2.386***	[1.749,3.255]	2.277***	[1.679,3.087]	2.385***	[1.772,3.210]	2.359***	[1.751,3.179]
Black	1.064	[.782,1.449]	1.049	[.771,1.429]	1.073	[.791,1.456]	1.032	[.757,1.405]
Hispanic	1.320	[.922,1.891]	1.303	[.909,1.869]	1.349	[.942,1.931]	1.300	[.911,1.855]
Age at First Offense	.980	[.837,1.146]	.974	[.832,1.139]	.975	[.832,1.142]	.973	[.828,1.142]
Prior Misd. Referrals	1.054	[.924,1.202]	1.058	[.923,1.212]	1.050	[.918,1.201]	1.058	[.924,1.211]
Prior Felony Referrals	1.224*	[1.025,1.461]	1.225*	[1.028,1.460]	1.219*	[1.022,1.453]	1.222*	[1.025,1.456]
Prior Weapon Referrals	1.070	[.789,1.451]	1.085	[.802,1.469]	1.081	[.792,1.475]	1.088	[.799,1.482]
Prior Violent Felonies	.929	[.682,1.265]	.931	[.682,1.271]	.909	[.666,1.241]	.914	[.669,1.250]
Prior Sex Off. Referrals	.487	[.166,1.434]	.453	[.157,1.311]	.481	[.162,1.433]	.499	[.171,1.455]
Prior Detention Stays	1.102	[.943,1.287]	1.091	[.933,1.276]	1.101	[.941,1.288]	1.095	[.937,1.279]
Prior Residential Placement	1.287	[.888,1.865]	1.261	[.866,1.839]	1.283	[.885,1.859]	1.244	[.848,1.825]
Total Risk Index at Exit	.933	[.701,1.243]	.948	[.712,1.264]	.949	[.716,1.259]	.939	[.702,1.256]
Constant	20.497*	[2.031,206.908]	20.845**	[2.339,185.750]	31.418**	[3.197,308.813]	15.581*	[1.576,154.042]

Note: Logistic regression estimates shown. All models include a fixed effect of each judicial district and each fiscal year. Clustered standard errors computed to account for nesting of youth within programs. * p < .05, ** p < .01 *** p < .001.

Implications for Research and Policy & Practice

Co-occurring disorders among youth in residential placement

The current study uncovered 19% of youth placed in juvenile justice residential programs in Florida have co-occurring mental health and substance abuse disorders. Importantly, the analyses presented above yield critical findings regarding the implications of generally accepted "best practices" for youth with co-occurring mental health and substance abuse disorders. The prominent Risk-Needs-Responsivity (RNR) Model is predicated on prioritizing higher risk youth and targeting dynamic risk factors empirically associated with reoffending, termed criminogenic needs (e.g., Andrews & Bonta, 2003; 2010; Andrews, Bonta, & Wormith, 2006, 2011). Youth, including youth with co-occurring mental health and substance abuse disorders, placed in FDJJ residential facilities have extensive criminal histories. Specifically, 51% of the full sample, and 49% of those with co-occurring disorders have a history of five or more felonies, 46% (full sample) and 44% (co-occurring) at least one prior violent felony, and nearly a quarter of the full sample and among youth with co-occurring disorders have an adjudicated weapon offense. Conduct disorder or oppositional defiant disorder was found in 66% of those without co-occurring disorders and 65% of those with such presentations, while 48% of those with co-occurring disorders have an ADHD diagnosis). In conjunction with their extensive risk factors, it is clear youth in FDJJ residential facilities are at high risk of recidivism.

The most prevalent criminogenic needs, as per the validated R-PACT assessment (Hay et al., 2018) for youth with co-occurring disorders were Employability, Peer Associations/Relationships, and Social Skills (with Aggression, School, and Antisocial Attitudes within their top three needs as well). Notably, these top-ranking criminogenic needs were the same as those found for youth without co-occurring disorders (both similar in order of ranking and in prevalence rates). These

comparisons speak to the similarity in which youth with and without co-occurring disorders receive programming interventions within juvenile justice residential programs aimed at reducing risk, enhancing strengths, and reducing recidivism. Importantly, as mentioned, within Florida, all youth with mental health and/or substance use issues are required to receive services treating such issues as per Florida Statute (F.A.C., Chapter 63N-1.001-1.015). However, there may be a distinction between such treatment and efforts aimed at risk reduction and strength enhancement in terms of RNR and criminogenic needs where mental health is not considered a substantial risk factor for recidivism (e.g., Andrews & Bonta, 2003). Whereas the current analyses focused on treatment services aimed at addressing dynamic risk/needs, future work may additionally benefit from consideration of the extent to which youth with co-occurring disorders receive additional and/or different treatment services and how those impact criminogenic needs and recidivism above that of interventions addressing criminogenic needs.

With respect to service provision to address criminogenic needs, youth with co-occurring disorders were just as likely to receive a service matched to one of their top three criminogenic needs as well as their top criminogenic need, and just as likely for such services to be provided at the hours of treatment dictated by the SPEP. Notably, youth with co-occurring disorders were less likely to receive services for the duration (in weeks) targets of the SPEP, but the services they did receive were slightly higher quality, on average. With respect to treatment provision components towards addressing criminogenic needs, residential programs performed remarkably similar for youth with co-occurring disorders and those without. Furthermore, the fact that residential programs perform similarly for youths with and without co-occurring disorders suggests that these programs have the capacity to effectively address a wide range of criminogenic needs. This insight can inform policy by encouraging investment in and the development of such programs, ensuring they are adequately resourced to meet the duration and quality standards necessary for effective intervention.

Incorporating these findings into juvenile justice policy could lead to more effective, evidence-based interventions that not only address the immediate criminogenic needs of youths but also contribute to long-term public safety by reducing recidivism.

Outcomes for youth with and without co-occurring disorders

Interestingly, there is evidence that the effects of "best practices" on risk reduction and protective enhancement during placement may not be as strong for youth with co-occurring disorders. Specifically, for youth without co-occurring disorders, treatment matching led to greater risk reduction in nine of the seventeen domains examined, while matching improved risk reduction across four domains for those with co-occurring disorders. Achieving the dosage dictated by the SPEP and receiving higher quality treatment services were (essentially) equally as irrelevant for risk reduction for youth with and without co-occurring disorders. The limited number of significant effects observed among youth with co-occurring disorders, as compared to those without such disorders, might be attributed to low statistical power. Statistical power is the probability that a study will detect an effect when there is an effect to be detected. Low statistical power means there is a higher chance of failing to identify true effects or differences when they actually exist. This situation can occur due to several factors, including small sample sizes, high variability within the data, or the magnitude of the effect being smaller than anticipated. In the context of the current study, it is plausible that the studies examining the effects of treatment matching, achieving SPEP dosage, and receiving higher quality treatment services might not have had sufficient statistical power to detect significant effects, particularly for youth with co-occurring disorders. This population is inherently diverse and complex, likely exhibiting a wide range of responses to treatment due to the interplay between mental health and substance use disorders. Acknowledging the potential for low statistical power underscores the importance of interpreting the findings with caution. It suggests that the lack

of significant findings does not necessarily indicate that these interventions are ineffective for youth with co-occurring disorders. Rather, it highlights the need for further research with more robust study designs and perhaps more sensitive measures to fully understand the efficacy of treatment practices for this unique and vulnerable population.

With respect to enhancing strengths, again treatment matching had more significant effects for youth without co-occurring disorders (increasing strengths across seven of the seventeen domains, compared to no increases for co-occurring youth). Similar to risk reduction, both achieving SPEP dosage and higher treatment quality were nearly equally iatrogenic for both groups of youth (with all significant effects found being in the opposite directions hypothesized).

Most notably, however, as (for better or worse) the focal outcome of a juvenile justice agency designed to protect the public, the recidivism rate for youth without co-occurring disorders was 46.7%, while that for youth with co-occurring disorders was 46.2% (a non-significant difference). Any service provision differences or differences in the effects of those services on criminogenic needs notwithstanding, the current study illustrates youth with co-occurring disorders do not reoffend at higher rates. As they presented with similar criminal histories and criminogenic needs as youth without co-occurring disorders, it appears that any additional issues (including clinical and/or substance use) and needs (non-criminogenic) do not increase subsequent reoffending, on average.

Extent of RNR and SPEP adherence

The current study demonstrates substantial evidence that purported "best practices" (treatment matching, treatment quality, and appropriate treatment dosage) are occurring at high rates across FDJJ residential programs. For both youth with and without co-occurring disorders nearly ninety percent of youth received at least one intervention matched to one of their top three

criminogenic needs (89.3% of co-occurring youth, 89.8% of youth without co-occurring disorders). That finding alone is a testament to the extent to which FDJJ has operationalized and trained (as part of mandatory R-PACT training) such targeting. For comparison, only 73.1% of youth received a treatment matched to a top three criminogenic need among youth completing FDJJ residential placements from July 1, 2014 through June 30, 2015 (Baglivio, Wolff, Howell, Jackowski, & Greenwald, 2018), showing an over 23% improvement (or a full 17 percentage points higher) for the current study of residential completions between 2016 and 2019.

This illustrates that FDJJ residential providers are getting better at matching services to assessed criminogenic needs over time. Importantly, both the 73% in the earlier work examining FDJJ residential youth, and the 89% in the current study are both well above the proportion with matched needs found in prior work of both youth under probation supervision in the community (57%; Flores, Travis, & Latessa, 2004) and among institutionalized juveniles (Singh et al., 2014). Similarly, the proportion of youth achieving SPEP target hours increased from 59.9% in the earlier study of FDJJ youth to 85% and 82.8% for youth without and with co-occurring disorders, respectively, in the current study. Regarding SPEP target weeks of treatment, the earlier work showed 46.7% adherence to SPEP standards, while the current study boasts 76.3% and 72% adherence for youth without and with co-occurring disorders, respectively. Furthermore, and even more dramatically, an earlier analysis using the same operationalization of treatment quality as the current study demonstrated that the average treatment quality of interventions received during placement was a possible 3.1 out of 10 points (Baglivio, Wolff, Jackowski, Chapman et al., 2018), in comparison to the current study finding a median average treatment quality score of 8.5 out of 10. This equates to a nearly 2.5 times higher average treatment quality score across FDJJ residential programs in just a few additional years of the agency's operationalization of the SPEP.

Notably, with respect to juvenile justice system policy importance, the FDJJ has mandated matching services to assessed needs, and that all residential providers input intervention dosage into their centralized information system, but additionally, FDJJ conducts quarterly monitoring of SPEP dosage and treatment quality, and formal annual reporting of SPEP adherence (https://www.djj.state.fl.us/research/standardized-program-evaluation-protocol-spep/spep-residential-reports2). Deficiencies in SPEP components and case planning failing to match criminogenic needs are "caught" during quarterly and annual reviews and regular monitoring by FDJJ of residential providers, and such deficiencies result in contract actions.

While this level of adherence to the RNR Model's matching construct, SPEP dosage targets, and SPEP treatment quality is commendable and a demonstration that a state agency can operationalize, monitor, and improve dramatically over just a few years, the high rates of adherence make analysis challenging. As mentioned, the average treatment quality was over 8 points out of possible 10, which is classified as high quality per FDJJ's operationalization (0-3= low quality, 4-7 medium, and 8-10 points high quality). If all programs deliver interventions at high quality, then assessment of quality ceases to differentiate those who have risk reduction, strength enhancement, and lower recidivism. Similarly, as virtually all youth get a treatment matched to their assessed dynamic risks as per a validated assessment, matching will become irrelevant in terms of a statistical predictor of outcomes. While this is disheartening (for researchers and the agency alike), it by no means the agency should abandon RNR and SPEP concepts, but rather continue to embrace them until adherence is universal.

Operationalizations warranting discussion

There are certain FDJJ operationalizations of RNR and SPEP components worthy of additional discussion. First, treatment matching is considered to have occurred if one of the top

three dynamic risk factors is targeted, with a ranking of such risks automated from the software-scored R-PACT. Completing the assessment results in an overview report that displays a bar graph illustrating the proportion of dynamic risk in each domain on the left side (rank-ordered with the highest risk on top), and the proportion of dynamic protective of each domain on the right side of the graph for the given youth. This assists staff with targeting a top three need in case/treatment planning. Notably, however, all youth without a high school diploma or equivalent are required to attend school (conducted on-site by certified teachers) five days per week, year-round (assisting with credit recovery as all students attend throughout the summer). Due to this, most programs do not deliver additional interventions that target dynamic school risks (attendance, which is mandated, performance/grades, or conduct, which is addressed via behavior motivation systems providing positive reinforcement of prosocial behaviors). Additionally, employability skills and vocational training are not part of the SPEP process in Florida (though the SPEP does include dosage criteria for vocational training). Every residential program has mandated soft skills, pre-vocational, and vocational training requirements dictated in their specific contract (monitored extensively by FDJJ), however, as mentioned, those components are not subject to FDJJ's operationalization of SPEP review. As such, residential programs are not necessarily targeting school or employability with treatment/intervention services.

Certainly, case/treatment planning often includes education and vocational goals and objectives, but *treatment* is most often not targeted to such needs. As such, it may be worth considering policy that allows for targeting one of the top three criminogenic needs (dynamic risks) that does not include school or employability. As demonstrated in the current study, employability was the top assessed need of 40% of the full sample, and 38.5% of youth with co-occurring disorders specifically, which were the highest percentages for any criminogenic need. Furthermore, school was the second highest need for 16.9% of the full sample and 15.3% of youth with co-

occurring disorders. If programs are not specifically targeting those needs with treatment interventions, some youth may not have been considered to receive matched treatment services in the current study, when in fact, they all attended school and/or had pre-vocational/vocational training provided during placement. This may mean that the effects of treatment matching in the current study (which were relatively strong and in the direction hypothesized for risk reduction, strength enhancement, and reduced recidivism) were in fact conservative estimates.

A second component worth mention is that of intervention dosage (hours and weeks). As stated, residential providers are required to enter treatment dosage into FDJJ's centralized information system. This includes adding the specific youth from a pre-populated roster to a designated group (e.g., an aggression replacement training, ART, group), the date the intervention started, checking which specific lessons each individual youth received, the hours for each lesson (in quarter-hour increments), and the date each specific youth completed that specific intervention/service. Such data entry is mandated in contract. Importantly, paper sign-in sheets are required to be maintained onsite for FDJJ to monitor and review, which occurs at minimum quarterly). Importantly, any youth that does not have a date of completion for the specific intervention/service will be attributed zero weeks (as FDJJ's information system cannot calculate weeks of service without a start date and an end date). Therefore, any youth for which a staff did not enter a completion date will be attributed zero weeks (regardless of the number of hours that youth could have been attributed). Furthermore, any youth who staff fail to enter all of the lessons and contact hours may not reflect the actual hours of service that the youth received. As such, the dosage (hours and weeks) data used in the current study is indeed the best available data, but is subject to error based on staff's level of adherence. FDJJ mandates, quarterly monitoring, and contract action based on deficiencies have certainly improved data entry over the years since SPEP implementation in Florida (which occurred in 2014; Baglivio, Wolff, Howell, et al., 2018). However,

there is not 100% adherence by all staff entering data across all programs. The extent to which data capturing intervention dosage is inaccurate creates obvious error to the estimates provided herein and may, at least partially, explain the lack of significance of treatment dosage on risk reduction, strength enhancement, and recidivism found in the current study.

Additionally, the FDJJ operationalization of treatment quality warrants discussion. Recall that the components of treatment quality, as operationalized by FDJJ, include 1) whether the clinician/staff delivering the service has been trained specifically *on that service*, 2) whether the service has a detailed manual/protocol, 3) independent/external fidelity monitoring (conducted by FDJJ onsite), 4) turnover of staff delivering the service, 5) monthly fidelity monitoring by the program, 6) corrective action to remediate deficiencies identified during fidelity monitoring, and 7) staff evaluation assessing delivery of the specific service. While Lipsey (2009) was not able to get quite that granular in his meta-analysis, FDJJ operationalized the seven components of treatment quality listed. Likely, the most important components of quality would be whether the staff were trained to deliver that service specifically, and a set curriculum with a manual and supplemental materials, such as handouts and structured activities, for the facilitator to deliver the service (e.g., Mihalic, Fagan, and Argamaso, 2008). Regular fidelity monitoring using a standardized protocol is likely also important to enhance facilitator skills (e.g., Fixsen et al., 2005; Schoenwald et al., 2004; Waltz, Addis, Koerner, and Jacobson, 1993), as is administrative support and staff evaluation to minimize drift (e.g., Fixen & Blasé, 1993; Fixsen et al., 2005).

The component that is not supported by as much research may be staff turnover of those staff delivering the intervention. For FDJJ residential programs, the services must still be provided regardless of whether a facilitator's employment is voluntarily or involuntarily terminated, as gaps in actual services result in contract action. Additionally, a facilitator of a given service (e.g., aggression replacement training) may not be a given youth's individual therapist or case manager (meaning any

bond or rapport may not be as relevant to group services, but certainly could be). As mentioned, the median treatment quality score was nearly 9 out of a possible 10 points. All FDJJ providers ensure staff providing the service are trained in the specific service, there is universally a manual dictating service provision, and monthly fidelity monitoring is required (though may not occur every month of the year if turnover occurs). However, staff turnover is certainly an issue in juvenile justice programs, including in Florida. While not evaluated herein, it is likely that the most frequent missed scores in treatment quality are related to the turnover of the facilitator. But, as mentioned, the services must still be provided. For these reasons, we believe that the small gap between the best and worst programs in terms of average treatment quality are the result of staff turnover but, again, the services were indeed provided. Further supporting this position is prior work showing that staff turnover was unrelated to changes in dynamic risk during residential placement, length of stay in a residential placement, or subsequent recidivism among youth completing FDJJ residential programs (Wolff, Limoncelli, & Baglivio, 2022), though, notably, staff unexcused absences were related to all three outcomes.

The issue of staff turnover in FDJJ residential programs highlights a complex challenge within juvenile justice systems, particularly in maintaining high-quality intervention delivery. The finding that services must continue despite staff changes, combined with the requirement for trained facilitators to deliver specific services, underscores the importance of systemic resilience and continuity in treatment provision. There are a number of recommendations to address staff turnover and maintain or even improve treatment quality. First, residential providers should establish rigorous training programs for new hires that not only cover the specifics of the interventions they will deliver but also emphasize the importance of building rapport with youth. Continuous training opportunities should be available to all staff to keep them updated on best practices and engaged in their professional development. Secondly, residential providers contracted by the state should

develop comprehensive support systems for staff, including competitive compensation, career development opportunities, mental health support, and a positive work environment. Implementing strategies to increase job satisfaction and organizational commitment can reduce turnover rates. Finally, it is important that providers continuously monitor the impact of staff turnover on treatment quality and youth outcomes. This should include analyzing the reasons behind turnover and implementing targeted interventions to address these causes. By implementing these strategies, FDJJ and other juvenile justice departments may be able to better manage the challenges posed by staff turnover, ensuring that the quality of interventions remains high and that youth continue to receive the support and treatment they need.

Stability of risk and protective factors

The current study uncovered a great deal of stability of dynamic risk and protective factors during placement. This extent of stability is consistent with that found in a prior NIJ-supported grant examining FDJJ youth completing community-based placements wherein the sample evidenced 6 distinct trajectories in total dynamic risk, but 33.1% of youth evidenced stability and 8% of youth actually had increasing risk over time (Wolff, Baglivio, & Intravia, 2023). This stability led the current analysis to supplement examining the effects of treatment matching, dosage, and quality on the *extent* of risk reduction and strength enhancement with examining *whether* risk was reduced or strengths enhanced at all. Prior work examining youth completing FDJJ residential placements showed six distinct trajectories of risk reduction/strength enhancement during placement, with less than 7% of the youth not evidencing improvements during placement (Baglivio, Wolff, Piquero, Howell, & Greenwald, 2017). Additionally, earlier prior studies of FDJJ youth completing residential placement demonstrated that risk and/or risk and protective changes during placement impacted subsequent reoffending considering the totality of overall risk and protective changes together, with

changes in between five and six criminogenic needs impacting recidivism (e.g., Baglivio, Wolff, Jackowski, & Greenwald, 2017; Baglivio, Wolff, Piquero, DeLisi, & Vaughn, 2017), though fewer criminogenic need changes exerting an effect among females (Baglivio, Wolff, Piquero, Howell, & Greenwald, 2017). As such, the extent of stability among the current study's sample was unexpected for a sample of youth completing FDJJ residential placements.

One factor that may contribute to the pervasive stability found in the current analysis is that the R-PACT responses are pre-populated into reassessments from the initial assessment. The response selected from the prior administration is highlighted in the current assessment to remind the case manager which response was selected. The user can then keep what was selected, or change the response. During the development of the R-PACT in Florida the workgroup made the decision to pre-populate responses into subsequent R-PACT reassessments to both 1) enhance efficiency and potentially save time for case management staff completing the reassessment (only having to change those responses that changed since the prior assessment, rather than enter over 100 responses each 90-day reassessment, as a risk/needs assessment within residential programs was new to FDJJ at the time and the time to assess was raised as an issue), and 2) as an attempt to enhance reliability. The reliability issue was related to static items (such as history of physical abuse, which, if endorsed once should always be endorsed on future assessments, unless, of course, proven untrue), and also as a reminder of what was selected before to avoid fluctuations in scoring simply due to staff not remembering how they scored items during the last assessment. However, the pre-population of items may unintentionally have led to the stability issue uncovered in the current analysis. It is certainly quicker and easier for staff to just keep all prior responses and click save then it is to take the necessary time to answer all of the items in the reassessment. Unfortunately, there is no way to empirically uncover how much of the stability observed is related to the issue of item scoring being carried over from prior assessments. Juvenile justice agencies must balance efficiency and staff time

with intra-rater reliability concerns among assessment users. Agencies and providers would be wise to implement risk assessment fidelity monitoring protocols wherein seasoned staff and/or staff deemed "expert raters" periodically observe assessments and provide coaching and oversight.

The concern related to risk assessment fidelity is potentially related to the outcomes observed in the current study. As mentioned, is the issue of dynamic risk and strength stability over time. Additionally, there is a possible relationship between fidelity to measurement in risk assessment and poor treatment quality of interventions delivered and intervention dosage, meaning this relationship can have significant implications for both treatment outcomes and overall effectiveness (recidivism). Fidelity to measurement in risk assessment refers to the accuracy and consistency with which assessments are conducted to identify the risks and needs of youth in residential treatment programs. High fidelity is essential for ensuring that the treatment provided is based on accurate and comprehensive information (e.g., treatment matching), and essential for measuring progress during placement. A lack of treatment matching to criminogenic needs would arise when there is low fidelity in risk assessment, leading to misinformed or inadequate case/treatment plans that fail to address the actual specific needs of the youth, which requires high-quality, fidelity-driven risk assessments to accurately identify these needs. The fidelity of measurement in risk assessments is also critical for ongoing program evaluation and improvement. Without accurate and reliable risk/needs data, it is difficult to evaluate the effectiveness of treatment interventions and make informed decisions about program modifications and assess treatment progress at the individual youth and aggregate levels.

Additionally, poor treatment quality of the interventions provided to address risk/needs likely also persists in programs that fail to prioritize high fidelity in measurement, as there is a lack of feedback mechanisms to identify and address treatment deficiencies. Programs that do not prioritize

risk assessment fidelity likely also may not prioritize treatment quality or entry of accurate dosage information into an information. The quality of treatment in residential programs is closely linked to outcomes for youth including reductions in risk, enhancement of strength, and reduced recidivism (e.g., Baglivio, Wolff, Jackowski, Chapman et al., 2018). Programs with low fidelity to measurement in risk assessments are less likely to achieve positive outcomes, as the treatment provided may not adequately address the underlying issues contributing to the youth's behavior. This can lead to more stability in risk/needs during placement and/or higher rates of recidivism and longer-term negative outcomes.

To address these challenges, residential treatment programs should prioritize the development and implementation of rigorous training for staff on conducting risk assessments, invest in quality improvement processes to monitor fidelity to measurement, and adopt evidence-based practices that have been shown to improve treatment outcomes. Additionally, ongoing research and evaluation are essential for identifying best practices in risk assessment and treatment planning, as well as for informing policy and practice improvements in residential treatment settings. Juvenile justice agencies that leverage private providers would also be wise to consider external fidelity monitoring of program risk assessment processes.

Limitations

The current analysis is not without limitations and suggestions for future study. First, the limitations of the current measurement of co-occurring disorders warrant discussion. While the mental health diagnosis was captured, the current study purposely excluded conduct disorder, oppositional defiant disorder, and ADHD from inclusion as mental health disorders, which certainly lowered the proportion of youth deemed to have such disorders (e.g., 66% of youth were indicated

as having conduct disorder). Further, as the R-PACT assessment did not capture substance abuse diagnoses, the current study leveraged the MAYSI-2 administered at admission to the residential program to assess whether youth had substance use issues. While a host of prior work has indicated a strong relationship between the MAYSI-2 alcohol/drug use scale and meeting DSM-IV criteria for substance abuse/dependence disorder (AUC = ranging from .80 - .87; Hayes et al., 2005; see also Archer et al., 2010; Wasserman et al., 2004), a formal diagnosis would have been preferred. These limitations (relying on the MAYSI-2) and purposeful exclusions (not including conduct disorder, ODD, and ADHD) may have contributed to the substantially lower prevalence of co-occurring disorders found in the current study (19%) relative to the 61% uncovered by meta-analysis (Shufelt & Cocozza, 2006; see also Teplin et al., 2002; Wasserman et al., 2002). However, it is also true that only 31.9% of the current FDJJ residential program capacity is designated as substance abuse beds (as per FDJJ's information system March 2024, program information available at: https://www.djj.state.fl.us/programs-facilities/residential-facilities), which nearly matches identically the 31.5% of the current sample determined by the MAYSI-2 to have substance use/abuse issues. It may simply be the case that a large proportion of adolescents in the juvenile justice system in Florida with substance use/abuse issues are being served in the community and do not escalate to residential placement. This potential would be interesting to pursue with further research, as the current study found the youth with co-occurring disorders have remarkably similar criminal histories to youth without co-occurring disorders. Whether juvenile judges weigh substance use/abuse in disposition decisions is, of course, an important empirical question.

Future work would benefit to include, in addition to static risk, dynamic risk, and protective factors, a measure of the time in which the youth has remained crime-free (e.g., recidivism-free time), as a host of prior work has indicated the importance of recidivism-free time in the examining the likelihood of recidivism (Frisch-Scott & Nakamura, 2022; see also Blumstein & Nakamura,

2009). Such survival analysis or "time to failure" was not possible in the current study as data did not provide the subsequent date of any adult convictions among the sample (only a dichotomous indication of recidivism). While whether youth with co-occurring disorders have similar recidivism rates is essential information, so too is whether the speed at which they reoffend relative to that of youth without co-occurring disorders is critical to our full understanding of the impact of co-occurring disorders on recidivism.

Relatedly, there are limitations to the measurement of recidivism in the current study. First, the state of Florida does not report data on offending which falls outside of the 365-day follow-up period, meaning any delinquent or criminal behavior that occurs after one year is not captured in the current analysis. Secondly, all recidivism measures are limited to offending within the state, and while this is superior to a number of studies that rely on county-level data, it is possible that some portion of offenses are not captured if they occurred in neighboring states. We attempted to limit this possibility by excluding youth who resided outside of Florida at the time of their arrest in Florida, yet have no way of knowing whether any Florida youth moved to other states or committed offenses while vacationing/traveling outside of Florida during the one-year follow-up.

Lastly, future work would benefit from availability of risk assessment fidelity monitoring information, as discussed above. Some notion as to the extent to which risk assessments are being completed as per best practices determined by expert raters would lend additional credence to study findings and largely eliminate potential cofounding interpretations of iatrogenic and null findings contrary to expectation. Additionally, data entry fidelity with respect to contact hours of interventions provided to youth and especially the completion data of those services is paramount (as discussed, a missing completion date results in attributing zero weeks of service, regardless of the hours of service entered).

Conclusion

The current study examined differences among youth in deep-end juvenile justice residential placement who did, and did not, present with co-occurring disorders. The prevalence of co-occurring mental health and substance use/abuse issues was found to be 19%, far lower than that of prior work. Notably, we demonstrated more similarities than differences between youth with and without co-occurring disorders, both in terms of their criminal histories and the prevalence of their criminogenic needs. Additionally, the residential programs across Florida appear to provide treatment at similarly high levels of integrity, as measured by 1) matching treatment services to the highest three dynamic risk assessed criminogenic needs, 2) providing dosage of treatment at the number of contact hours and weeks of service provision as dictated by the SPEP assessment, and 3) providing high quality treatment as per FDJJ's operationalization of SPEP treatment quality. Importantly, while treatment provision occurred uniformly, youth with co-occurring disorders do not appear to benefit as equally well from treatment matching to assessed needs, though such matching was certainly beneficial for such youth. Additionally, the recidivism rates were substantively identical between youth with and without co-occurring disorders, indicating (as they presented with similar criminogenic needs and criminal history) youth with co-occurring disorders may not be expected to pose higher risk to public safety or likelihood of reentering the justice system.

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