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**Document Title:** Risk and Protective Trajectories,  
Community Context, and Juvenile  
Recidivism

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Ph.D.

**Document Number:** 307118

**Date Received:** June 2023

**Award Number:** 2020-JX-FX-0004

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**Project Title:**

Risk and Protective Trajectories, Community Context, and Juvenile Recidivism

**Award Number:**

2020-JX-FX-0004

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**Award Recipient Organization:**

Research Foundation of the City University of New York  
230 West 41st Street  
New York, NY 10036-7296

**Project Period:** 01/02/2021 – 12/31/2022

**Award Amount:** \$116,447

## **Risk and Protective Trajectories, Community Context, and Juvenile Recidivism**

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**Award Number:** 2020-JX-FX-0004

**This project was supported by Award No. 2020-JX-FX-0004 awarded by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice. The opinions, findings, and conclusions or recommendations expressed are those of the author(s) and do not necessarily reflect those of the Department of Justice.**

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## Introduction

Community supervision, such as probation, is the most common disposition among juvenile delinquency cases in the U.S., representing 51% of the 483,400 delinquency cases receiving a court sanction in 2019 (OJJDP, 2022). Optimal supervision, treatment, and rehabilitation of these adolescents is paramount to both the youth's future success and public safety interests, as the vast majority of delinquent youth remain in the community after being formally processed. This fact is demonstrated through Florida data (the focal state of the current analysis), where only 5.4% of all arrests in fiscal year 2017-18 resulted in a residential placement removing those youth from the community (FDJJ, 2022). The remaining 94.6% of youth entering the FDJJ system remained in the community post-disposition, inclusive of those receiving diversion, probation supervision, and day treatment/day reporting services. Juvenile probation officers and community-based service providers contracted by juvenile justice systems must understand whether services and/or court sanctions are improving the likelihood of success for the youth on their caseload and enhancing public safety through assisting the juveniles' desistance from delinquency.

The current study fills significant gaps in the literature by exploring the different trajectories in risk and protective factors (in tandem) among youth during their time on community-based supervision, while simultaneously considering the community context of the area in which those youth reside. Specifically, the project aimed to 1) empirically identify the distinct trajectories in dynamic risk and protective factors among youth under community-based juvenile justice dispositions, 2) assess the relationship between community contextual measures/individual factors and trajectory group membership, 3) assess whether different patterns in risk/need over time (trajectory group membership) is associated with new offending during and post- completion of community-based placements and 4) examine trajectories in risk across multiple domains (i.e., dual

trajectories) in order to assess whether changes in one risk factor are associated with changes in others.

The Risk–Needs–Responsivity (RNR) model has unequivocally been 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 are to assess and prioritize resources to higher risk cases (*risk*), target individualized (based on assessment) dynamic criminogenic needs through evidence-based intervention (*needs*), and deliver services in predominately cognitive behavioral modalities (*general responsivity*) while considering relevant characteristics such as gender, culture, motivation to change, intellectual ability, and traumatic exposure (*specific responsivity*). The RNR paradigm is posited to 1) reduce risk, 2) enhance protective factors, and 3) improve public safety through decreased (re)offending likelihood. Additionally, the reduction in risk (and subsequent reoffending) achieved through the use of the RNR model is believed to lead to shrinking the astronomical 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). The central concern, therefore, becomes how juvenile justice professionals can assess (through objective measurement) whether their actions are leading to the anticipated reductions in risk and enhancement of protective factors. According to the RNR model, this is where regular reassessment becomes vital (Vincent, Guy, & Grisso, 2012; see also Olver et al., 2007). Further, this assessment and subsequent reassessment must be focused on dynamic, changeable factors that are empirically related to reoffending, termed criminogenic needs.

## **Why Dynamic Risk?**

A central, empirically supported, premise of developmental/life-course criminology is the notion that changes in local life circumstances play essential roles in altering offending pathways (Dong &

Krohn, 2016; Horney et al., 1995; Laub & Sampson, 1993; Piquero et al., 2002). Arguably, the lives of adolescents, especially juvenile offenders, are more dynamic than adults, especially within concepts of mood, relationships, and personality (Viljoen et al., 2017; see also Maciejewski et al., 2015; Poulin & Chan, 2010; Roberts, Walton, & Viechtbauer, 2006), as well as residential mobility (Wolff, Baglivio, Intravia, Greenwald, & Epps, 2017). This fluidity makes regular reassessment of risk and protective factors paramount. Unfortunately, the reassessment of the risk-needs component of the RNR paradigm is both infrequently occurring reliably within justice systems, and has received surprisingly little research attention, especially among juvenile offenders (Baglivio, Wolff et al., 2018).

Notably, a strong and ever-growing body of research substantiates the enhanced predictive accuracy of risk/need assessment tools from the inclusion of dynamic/changeable factors above that of static measures exclusively (e.g., Bonta & Andrews, 2016; Brown, St. Amand, & Zamble, 2009; Brown & Singh, 2014; Perrault et al., 2017; but see Caudy, Durso, & Taxman, 2013). Unfortunately, exclusive reliance on static measures of risk never allows for the measure of (re)habilitation or decreases in risk (i.e., an individual can only go up in risk when relying on prior criminal history or history of events/conditions). Further, recent work indicates dynamic measures, in contrast to static, predominately criminal history items, improve racial equity in assessment and related treatment planning/decision-making (Cuevas et al., 2019; Miller et al., 2021). The core components of dynamic factors are that they 1) are empirically related to reoffending, and 2) are changeable. Focus on changeable factors allows for examining treatment progress, i.e., whether the juvenile's holistic situation is improving, staying the same, or getting worse in terms of factors related to the likelihood he/she will have future contact with the justice system. Conversely, risk that is predicated exclusively on static factors can only get worse over time (a person can only be arrested more times in the future if using number of prior arrests, for example; that person will



never have been arrested less than he/she already has been). Examining treatment progress, however, requires inclusion of dynamic factors *and* requires both an initial (baseline) assessment of such factors, and at least one additional subsequent assessment (at least one reassessment). Importantly, reassessment has been demonstrated to improve predictive validity above that of initial assessment (e.g., Babchishin & Hanson, 2020; Clark, Peterson-Badali, & Skilling, 2017; Davies, Lloyd, & Polaschek, 2020; Lloyd et al. 2020; Vincent et al., 2012), where more the more proximal reassessment performs better at predicting future offending. This calls for standards of practice where “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).

## **Existing Evidence on Dynamic Risk**

Few studies have assessed the extent to which risk assessment scores change over time and whether such changes subsequently increase or decrease future offending. More limited is research examining whether changes in risk can be attributed to targeted interventions and how these changes may be related to subsequent reoffending. Notable exceptions have examined changes in 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 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, this work examined only the composite risk assessment scores, without addressing which specific dynamic risks are best targeted by practitioners to optimize the chances of success.

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 was 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.

Unfortunately, the study of changes in dynamic risk/needs and subsequent outcomes among justice-involved juveniles is just as limited. Using the random assignment of at-risk juveniles to a delinquency prevention program, Hay and colleagues (2010) examined whether 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 targeted intervention leads to reduction in risk/needs, the study lacked efforts 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. In contrast, a much larger study of 12,302 juvenile offenders returning from residential placement in Florida found changes made in 6 of 17 dynamic risk domains during placement were associated with reoffending upon community re-entry (Baglivio, Wolff, Jackowski, & Greenwald, 2017). This study advanced from prior work in included community context measures, finding some dynamic risk changes mitigated the effects of returning to more disadvantaged communities (Baglivio, Wolff, Jackowski et al., 2017). Advancing methodologically, an additional study leveraged a sample of 11,891 male and 1,930 female juveniles re-entering the community from residential placement in Florida used propensity score matching to ensure youth who subsequently did and did not recidivate post-release were equivalent at admission, finding youth who abstained from subsequent delinquent behavior evidenced larger dynamic risk reductions during placement (Baglivio, Wolff et al., 2018). Recent work, focusing on youth under court supervision, demonstrated reductions in overall risk within the first 19 months of supervision, where after risk increased (Kitzmilller et al., 2022). This relationship held across race/ethnicity, though the effects were significantly (and substantially) stronger for White youth. Further, examining the growth models of race/ethnic specific criminogenic needs domains demonstrated White youth evidence

reduction over time, while the criminogenic risks of Black youth were least amenable to reduction, as per the authors (Kitzmilller et al., 2022).

## **Limitations in Prior Work Assessing Dynamic Changes**

Existing research devoted to understanding the association between dynamic risk and subsequent offending suffers from several shortcomings. First, most studies have been focused exclusively on risk factors, to the detriment of neglecting “promotive” or protective factors. We argue, as Loeber, Slot, and Stouthamer-Loeber (2008) have observed, “we have seen that knowledge of the proportion of risk and promotive factors is more important than knowledge of either” (p. 159). The limited study accounting 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). This “buffer” concept subtracts the number of one type of exposure from the other (promotive minus risk, or vice versa) to gain an understanding of the relative exposure/balance of risk to promotive factors.

Additionally, prior examinations of dynamic changes have failed to assess whether individuals experience different “trajectories” of overall risk and protective factors over time. That is, do changes in risk and protective factors fall into distinct patterns and are those patterns associated with later outcomes. Stated differently, trajectories (such as those derived from Semiparametric Group-based Modeling) can be leveraged to provide a useful heuristic to describe different subsets of youth, identified using their changes in cumulative risk and strengths over time, and whether these differences are related to subsequent offending. Only one prior study to our knowledge has examined trajectories of the extent to which risk factors and promotive factors, examined through a combination “buffer score” (buffer = promotive – risk), change, examining

changes from admission to release from juvenile justice residential placement (Baglivio, Wolff, Piquero, Howell, & Greenwald, 2017). Results demonstrated youth can be categorized into distinct trajectories of risk and protective factors over time, as the study identified six latent groups: 1) low initial, minimal gains, 2) low initial- delayed and sizable gains, 3) low initial- rapid and moderate gains, 4) moderate initial- moderate gains, 5) moderate initial- minimal gains, and 6) high initial- moderate gains. Importantly, this work demonstrated a small, but sizable group, approximately 7% of the youth that made substantively no gains/improvement during placement. Critical to policy and practice, trajectory group membership was predictive of subsequent reoffending. The better a youth started off initially in terms of a risk-promotive balance (less risk, more strengths), the lower the subsequent reoffending; but also, the more youth improved during placement (greater risk reduction and protective enhancement), the lower the likelihood of recidivism (Baglivio et al., 2016). These results show improvements can occur during placement, and those improvements are predictive of future success. However, their analysis also identified some youth lack improvement and that the extent of improvement as well as the speed at which it occurs is not homogeneous.

Unfortunately, the one study which has assessed trajectories of overall risk/protective changes over time is limited in generalizability to youth in residential placement. Additionally, no study has ever examined whether changes in specific risk factors have similar trajectories as other risk factors within the same individual over time; i.e., no study has examined trajectories in risk across multiple domains (i.e., dual trajectories) to assess if changes in one risk factor are associated with changes in others. This is critically important to policy and treatment as it would demonstrate whether risk factors reduce/increase wholesale or if one factor may decrease as others increase. Essentially, assessing multiple trajectories in tandem would inform practice as to whether targeting one risk factor may have tangential/dispersed benefits across risk domains, or whether risk factors change independently of one another. Direction to juvenile justice policy and practice is needed, and

these inquiries are critical for youth under community-supervision. As stated above, the majority of all juvenile dispositions are to community-based services, such as probation (OJJDP, 2022). The extent to which there are different trajectories of risk/protective changes among adjudicated youth supervised in the community remains unanswered and is critically important to reduce the flow of youth into residential placement, flatten the age-crime curve (Loeber, Farrington, Howell, & Hoeve, 2012), and ensure public safety.

Examination of community-based risk/protective trajectories, however, encapsulates additional concerns not as relevant to changes in risk during residential placement. Notably, the community context in which the juvenile is being supervised is essential to consider. The above-referenced work is critical to our understanding that risk and protective factors change over time, these changes are measures of treatment progress, the changes are predictive of subsequent recidivism, and that all youth do not experience the same extent or trajectory of change over time. However, what is largely missing from dynamic change score research is the notion that the neighborhood in which a youth resides influences reoffending. We now turn to the importance of contextual effects on juvenile recidivism.

## **Contextual Effects and Juvenile Offending/Recidivism**

Resurgence of research on the effects of community context on antisocial and criminal behavior has occurred since the late 1990's (Chung & Steinberg, 2006; Elliott et al., 1996; Sampson, Raudenbush, & Earls, 1997; Sampson, Morenoff, & Gannon-Rowley, 2002; Wikstrom & Loeber, 2000). This line of inquiry often employs community contextual measures such as resource deprivation (Land, McCall, & Cohen, 1990), concentrated disadvantage, concentrated affluence (Brooks-Gunn et al., 1993; Kubrin & Stewart, 2006; Massey, 2001; Morenoff et al., 2001), and immigrant concentration (Wright & Rodriguez, 2014). Unfortunately, research and theory on the recidivism of previously

adjudicated juveniles has, to a large extent, neglected the potential for contextual factors to contribute to juvenile justice supervision and post-release outcomes (Abrams & Snyder, 2010).

Lynam and colleagues (2000) examined the interaction of community disadvantage and individual-level impulsivity on juvenile offending, finding the effect of impulsivity was strongest in more disadvantaged neighborhoods (see also Meier et al., 2008). Interestingly, impulsivity had a nonsignificant relationship to offending in affluent areas in that study, and results held in a subsequent analysis when the adolescents were 3-4 years older. Later work contrasted these findings in showing that the effects of impulsivity were amplified in neighborhoods with *higher* levels of affluence and collective efficacy, and lower levels of areas where there was public drinking, drug using/selling, or groups hanging out causing trouble and lower levels of moral/legal cynicism (Zimmerman, 2010).

Zimmerman and Messner (2010) found neighborhood disadvantage increased exposure to peer violence for both sexes, yet peer violence had a stronger impact on violent offending for females than for males. This study demonstrated how the gender gap of males violently offending at higher levels was reduced in areas of higher levels of disadvantage where female offending gets closer to approximating male levels. Similarly, in a study of 506 males in urban public schools, Peeples and Loeber, (1994) found that residence in disadvantaged neighborhoods rendered ethnicity nonsignificant in predicting delinquent behavior (after controlling for individual-level risks). Wright and Rodriguez (2014) found no significant relationship between reentry to communities marked by concentrated immigration with recidivism among 12,000 youth in a single county in Arizona. In contrast, examining Florida communities (Wolff, Baglivio, Intravia, and Piquero, 2015) found youth residing in disadvantaged neighborhoods to be at an increased risk of juvenile recidivism, but those living in neighborhoods marked by a high concentration of immigrants were roughly 6% less likely to reoffend. That research concluded, consistent with the broader literature on recidivism, that

community context is important in the prediction of juvenile recidivism (Wolff et al., 2015; see also Wolff, Baglivio, Piquero, Vaughn, & DeLisi, 2016; Wright, Kim, Chassin, Losoya, & Piquero, 2014). Examining juvenile recidivism using Pathways to Desistance data found concentrated disadvantage indirectly associated with juvenile offending, primarily through its association with exposure to deviant peers (Wright et al., 2014). Similarly, Wolff and colleagues (2016) found resource deprivation and concentrated disadvantage increased the likelihood of reoffending, while concentrated affluence served as a protective factor, associated with lower rates of recidivism. Examining juvenile recidivism among adolescents under community supervision in Philadelphia, Grunwald and colleagues (2010) found neighborhood level factors did not influence overall recidivism, violent offending, or property offending, but those factors were associated with drug offending. A study of Pittsburgh serious juvenile offending found neighborhood socioeconomic context did not have an effect on the onset of serious offending at an earlier age, but did impact later onset offending for adolescents scoring high on protective factors or who have a balanced mix of risk and protective factors (Wikström & Loeber, 2000). This study showed that youth with extensive risk offend similarly regardless of the context of where they live, but those youth with more protective factors or a mix of risk and protective factors are more likely to begin offending later in adolescence if they resided in an area of higher concentrated disadvantage. This shows even with extensive individual protective factors an otherwise well-positioned youth is more likely to offend if that youth lives in a disadvantaged area than a similarly well-positioned youth (extensive protective factors) living in a less disadvantaged area.

Examining the effects of neighborhood context in studies using risk/needs assessments is critically understudied. In one such exception, Onifade and colleagues (2011) examined the relationship between recidivism, risk assessment classification (e.g., low-risk, moderate-risk, high-risk), and neighborhood types composed of household hardship, instability, and labor capital



measures. Findings showed that both the higher the household hardship of a block group, the stronger the relationship between the risk tool (YLS/CMI) score and recidivism, and that the YLS/CMI substantially varied in predictive validity for offenders across block group types (Onifade et al., 2011). The authors note “Practitioners could use this information to identify youth for which recidivism was over- or underpredicted based on their block group socioeconomic status” (Onifade et al., 2011, p. 850). Knowing that risk assessment tools are more or less valid based on the characteristics of the assessed youth’s neighborhood is critical information for both practitioners and juvenile justice policy alike.

To our knowledge, only a single study has examined whether changes in dynamic risk/needs scores predict official recidivism, community socioeconomic contexts predict recidivism, and which risk/needs changes moderate the effects of community context (Baglivio, Wolff et al., 2017). This study found 6 of 17 dynamic risk changes examined (during residential placement) were related to subsequent recidivism, and, importantly, that changes in risks of antisocial relationships and changes in drugs and alcohol domains enhanced the protective effect of returning to an area of concentrated affluence. Youth that did not make as much progress in risk reduction did not experience as large of a protective effect of returning to more affluent areas. Importantly, this study addressing the interaction of dynamic risk changes with community context on juvenile recidivism suffered from two methodological shortcomings. First, the study examined only risk changes, neglecting consideration of protective factors/strengths in tandem. Second, due to small sample sizes returning to the same communities, community characteristics were measured at the zip code level. It is well known that zip codes are not homogeneous in nature and extremely diverse with respect to disadvantage/affluence, unemployment, immigrant concentration, residential mobility, and the like. Finally, that study examined juvenile offenders returning from residential placement, meaning no current study exists that examined the interaction of dynamic changes in risk and protective factors

with community context for youth on probation supervision, the most common juvenile justice sanction. The current study aims to fill this critical need. While community context has been shown to be important for youth returning from residential placement after treatment gains are realized within custody, the communities in which youth reside may play an even more important role in whether such treatment gains are realized in the first place; i.e., the effect of community context on risk/protective change trajectories of youth under community supervision.

## **Current Study & Plan for Report**

Prior work has established that risk and needs change over time, standardized risk/needs assessments capture that change, and that changes in risk/needs over time is related to the likelihood of reoffending (e.g., Baglivio, Wolff, Piquero, DeLisi, & Vaughn, 2018; Labrecque et al., 2014).

Unfortunately, the majority of prior work either examines changes in risk among adults with justice system involvement (e.g., Schlager & Pacheco, 2011) or changes in juvenile risk/needs during long-term juvenile justice placement (e.g., Baglivio, Wolff, Piquero, Howell, & Greenwald, 2017). Very little is known about whether/the extent to which risk and needs change over time among youth under juvenile justice supervision within the community. The current study advances from prior work by examining trajectories of risk and protective factors throughout probation supervision, whether such trajectories affect the likelihood of recidivism, and how community context influences those relationships.

- The study leverages all risk/need assessments completed on youth who completed community-based juvenile justice disposition placements between July 1, 2015 and June 30, 2018, indicators of social disorganization and immigrant concentration based on the census tract in which the youth reside, and multiple measures of official recidivism (described below). Specific research questions include:

**R1:** Identify whether specific trajectories of dynamic risk and protective factors among youth throughout their community-based dispositions;

**R2:** Assess the relationship between individual-level and community characteristics and trajectory group membership;

**R4:** Assess the extent to which changes in risk/need over time (i.e., trajectory groups) are associated with continued offending;

**R4:** Assess the potential of dual/joint trajectories of sub-dimensions of risk/needs to exist.

The report proceeds in the following steps: 1) description of the sample and measures, 2) the analytic approach to examine the research questions, 3) results of the analyses, 4) discussion and policy implications of the findings, 5) future research directions, and 6) concluding remarks.

## Sample

The report leverages Florida Department of Juvenile Justice (FDJJ) administrative data inclusive of youth who completed a community-based FDJJ placement between July 1, 2015 and June 30, 2018.

Community-based placements include formal diversion programs, probation supervision, day treatment/day reporting programs, and intensive family therapy as an overlay to probation supervision. FDJJ maintains a centralized information system capturing data on all youth referred for delinquency (equivalent to an adult arrest), inclusive of demographic indicators, complete offense history, justice system placement history, and risk/needs assessment data. As the current study focuses on changes in risk/needs over time, the sample excluded youth who were assessed for risk/needs on less than four separate occasions. All youth formally processed into the juvenile justice system in Florida are assessed for risk/needs using the Community Positive Achievement Change Tool (C-PACT). The C-PACT has two versions, a 46-item prescreen and a 126-item full

assessment. Both versions produce identical overall risk-to-reoffend classifications of low-, moderate-, moderate-high-, or high-risk. Only those items that are in both the prescreen and full assessment are used in the scoring of overall risk (meaning if a youth were administered both tools the resultant risk level would be identical). The full assessment additionally includes risk and protective scores for each of the domains of the tool (criminal history, school, use of free time, employment, relationships, family, drugs/alcohol, mental health, attitudes/behaviors, aggression, and social skills), with the exception of the criminal history domain including only a risk score and no protective score. All scores are the result of software scored responses to assessment items. As per FDJJ policy youth assessed as low- or moderate-risk are reassessed every 180 days, while moderate-high and high-risk youth are assessed every 90 days. The stipulated study exclusion of all youth with less than four such assessments necessitates specific minimum lengths of supervision for the study sample. Specifically, youth administered prescreen assessments must have been under supervision for at least 540 days (initial assessment, 180 days, 360 days, 540 days), while youth administered full assessments all had a minimum length of supervision of 270 days (initial assessment, 90 days, 180 days, 270 days). This study requirement results in two unique multiyear, statewide samples of 7,401 youth with four C-PACT prescreen assessments and a sample with 2,940 youth with four C-PACT full assessments. Notably, if a given youth had more than one community-based placement within the study timeframe, only the first placement was included. Additionally, youth classified with “other” or “unknown” race/ethnicity were excluded (72 in prescreen sample, 32 in full-screen sample). The outlined process resulted in two distinct samples used in specific analyses outlined below: 1) 7,117 youth with four C-PACT prescreen assessments, and 2) 2,877 youth with four C-PACT full assessments. To provide context regarding the uniqueness of the sample, a total of 19,575 unique youth had at least one C-PACT full assessment within the study

timeframe, meaning the current study's 2,877 youth with four C-PACT full assessments represents 14.7% of all youth with a full assessment ( $2,877/19,575 = .147$ ).

## Measures

Measures for the current study were garnered from data extracted from the FDJJ Juvenile Justice Information System (JJIS). As stated above, JJIS maintains complete demographic, offense, juvenile justice placement, and risk/need assessment (C-PACT) data on all youth referred in Florida.

Specifically, the current study used the final data files for three years of probation supervision placements for the FDJJ's annual Comprehensive Accountability Report (CAR;

<https://www.djj.state.fl.us/research/reports-and-data/static-research-reports/comprehensive-accountability-report>). The final Probation & Community Intervention dataset for the CAR indicates both placement information and recidivism indication for each community-based placement. These data were matched to extracted C-PACT data to select the first four C-PACT assessments (either prescreen or full assessments) for each youth commensurate with that specific placement. The C-PACT is conducted as a semi-structured interview, where most C-PACT items are self-reported and corroborated, when possible (with parents/guardians, child welfare workers, or teachers/school records), with the exception of criminal history items (prior offending) which are automated from the FDJJ information system and therefore do not depend on youth recall or the assessor's ability to classify offense and placement types. Of note, all individuals conducting C-PACT assessments are bachelor's degree-level staff who have successfully completed both a 3-day PACT/case planning training, and a 2-day Motivational Interviewing training. Notably, the validity of the C-PACT has been examined for multiple samples of Florida juvenile offenders for both males and females, and across age and dispositions (such as diversion, probation, and day treatment; Baglivio, 2009; Baglivio & Jackowski, 2013; Baird, Healy, Johnson, Bogie, Dankert, & Scharenbroch, 2013; Winokur-Early, Hand, & Blankenship, 2012). Regarding reliability of the C-PACT, Baird and colleagues (2013)

assessed inter-rater reliability using videotaped interviews and an offense history file, finding an intra-class coefficient (ICC) of .83, with 4% of items (5 items) with less than 75% agreement with an expert rater.

### **Dependent Measures- Recidivism**

Three distinct measures of official recidivism were used, which allows for examining the robustness of findings across the multiple classifications of reoffending. Specifically, *rearrest* was assessed as an arrest for a new offense within 365 days of the date the youth completed their community-based disposition. *Readjudication* was measured according to the official definition of recidivism for the FDJJ as an adjudication or adult conviction for an offense that occurred within 365 days of the youth completing the community-based disposition. Finally, a measure of *placement* in a juvenile justice residential facility or adult prison for an offense that occurred within 365 days of the youth completing community-based dispositions. For all three measures of recidivism both juvenile and adult offenses were included, as some youth were, or turned, 18 years of age during the 1-year recidivism follow-up. Adult offense, reconviction, and placement information is provided to FDJJ by the Florida Departments of Law Enforcement and Corrections. For the prescreen sample the rates of recidivism for rearrest, reconviction, and placement were 51.6%, 35.9%, and 10.5%, respectively, while the full assessment sample rates were 52.2%, 33.1%, and 16.5% (see Table 1).

**Table 1: Descriptive Statistics for Analysis of Dynamic Risk and Juvenile Recidivism**

	Prescreen Sample % / Mean (SD)	Full-screen Sample % / Mean (SD)
Rearrested	51.6%	52.2%
Readjudicated	35.9%	33.2%
Reincarcerated	10.5%	16.6%
Male	79.3%	82.1%
Age at Release	17.11 (1.68)	17.39 (1.54)
White	30.7%	30.3%
Black	54.8%	56.6%
Hispanic	12.6%	13.1%
Age at First Offense		
12 and Under	23.9%	34.6%
13-14	41.5%	43.0%
15	19.4%	14.3%
16	15.2%	8.2%
Prior Felony Referrals		
Zero	32.6%	13.0%
One	43.2%	31.6%
Two	14.2%	24.2%
Three or More	10.1%	31.2%
Prior Against-Person Felony Referrals		
Zero	73.3%	57.3%
One	25.7%	39.7%
Two or More	1.0%	3.0%
Prior Sexual Felony Referrals		
Zero	94.7%	95.2%
One	5.3%	4.8%
Prior Secure Detention Stays		
Zero	64.5%	26.1%
One	19.7%	24.4%
Two	6.5%	18.5%
Three or More	9.3%	31.0%
Prior Residential Placement		
Zero	87.9%	63.4%
One	10.4%	29.9%
Two or More	1.8%	6.7%
Community-Level Measures		
Social Disorganization	.460 (.798)	.410 (.808)
Immigrant Concentration	.033 (.840)	-.013 (.851)
N	7,117	2,877

## **Independent Measure: C-PACT Dynamic Risk**

### **Prescreen Total Dynamic Risk-**

The C-PACT prescreen contains 16 items that assess dynamic (changeable) aspects/characteristics across domains of school, peer relationships, family, substance use, attitudes, and aggression.

Specifically, school status was assessed through three dichotomous measures of *enrolled in school* (= 1), *dropped out/expelled* (= 1), and *graduated/equivalent* (= 1). *School conduct* in the most recent term captured whether the youth had recognition for good behavior, no problems with school conduct, problems reported by teachers, problem calls to parents, and problem calls to police, coded 1-5, respectively.

Of note, those that had already graduated were included with those that had no problems with school conduct as they did not evidence any risk from conduct, but also no protective

factor/strength. *School attendance* during the most recent term distinguished those with good attendance/few excused absences, those with no unexcused absences, some partial-day unexcused

absences, those with some full-day unexcused absences, and those who were “habitually truant” which is 15 or more unexcused absences in a 90-day period as per Florida Statute, coded 1-5,

respectively, with higher values indicating more risk). Youth who had already graduated were included with those that had no unexcused absences as they did not evidence any risk from

attendance, but also no protective factor/strength. *Academic performance* distinguished youth according

to grades obtained in the most recent term as being an honor student (mostly As), grade point

average (GPA) above 3.0, GPA between 2.0 and 3.0, GPA between 1.0 and 2.0, and those with

mostly Ds and Fs and a GPA below 1.0 (coded 1-5, respectively, with higher values indicating worse performance/lower GPA). Youth who had already graduated were included with those that had a

GPA above 3.0 as they did not evidence any risk from failing grades.

The youth’s *current friends* were classified as the youth having exclusively prosocial peers, those with no consistent friends, youth with a mix of prosocial and antisocial peers, and those with exclusively antisocial friends or self-reported or law enforcement verified gang



association/membership (coded 0-3, with higher values indicated more antisocial peers). *Household jail/imprisonment history* of the persons who are currently involved in the youth's household was used to distinguish those youth living in homes without such histories, and those with one household member (parent(s), sibling(s), or other household members) with such history, and those youth with multiple household members with incarceration histories (coded 0-2). Additionally, *parental problem history* distinguished youth living with parents with no problem history, those whose parents have problems in one domain (alcohol, drug, physical health, mental health, and/or employment problems), and those with problems in multiple domains (coded 0-2). *Parental authority/control* distinguishes youth who usually obey and follow household rules, those who sometimes obey or obey some rules, and those that are hostile towards or consistently disobey household rules (coded 1-3, respectively).

The youth's *current alcohol use* (within the past six months for the initial assessment and since the last assessment for reassessments) as not currently using alcohol, using alcohol, and using alcohol where such use disrupts functioning (coded 0-2, respectively). Disrupted functioning involves having a problem in any of these five life areas: education, family conflict, peer relationships, crime, or health, and usually indicates treatment is warranted. Use that contributes to criminal behavior typically precipitates the commission of a crime; there is evidence or reason to believe the youth's criminal activity is related to alcohol. Similarly, *current drug use* distinguishes youth as not currently using drugs, using drugs, and using drugs where such use disrupts functioning (coded 0-2, respectively).

The youth's *attitude toward responsible law-abiding* behavior distinguishes those who abide by conventional values, those who believe such values sometimes apply to him/her, do not believe conventions/values apply, and those who resent or are hostile towards responsible behavior (coded 1-3). The extent to which the youth accepts *responsibility for their antisocial behavior* classifies youth as

accepting responsibility for antisocial behavior, those that minimize, deny, justify or blame others, those that accept antisocial behavior as okay, and those that are proud of their antisocial behavior (coded 1-3, with higher values indicating a greater acceptance of antisocial behavior). The youth's belief in *verbal aggression* to resolve conflict/disagreement classifies those who believe verbal aggression is rarely appropriate, sometimes appropriate, or often appropriate (coded 1-3). Next, the youths' belief in *physical aggression* to resolve conflict/disagreement distinguishes youth who believe physical aggression is never appropriate, rarely appropriate, sometimes appropriate, or often appropriate (coded 1-4, respectively). Whether the youth reported or there was evidence of *violence* not included in the youth's criminal history were dichotomized into those that had (= 1). Violence could have been violent outbursts/uncontrolled anger, deliberately inflicting pain, using/threatening with a weapon, fire starting, violent destruction of property, or animal cruelty. Finally, those with problems with *sexual aggression* self-reporting or evidence (= 1) included aggressive sex, sex for power, young sexual partners, child sex, voyeurism, or exposure.

Preliminary analyses (exploratory factor analysis) suggested that each of the 16 dynamic prescreen measures described above loaded adequately on a single latent factor rather than capturing distinct domains of risk. Accordingly, all measures were first standardized and combined into an additive index of total dynamic risk across each of the four prescreen assessments for each youth ( $\alpha = .740 - .770$ ), with higher values on this index indicating higher levels of risk. It is this measure which is used in the group-based trajectory models described in greater detail below.

#### **Full Assessment Total Dynamic Risk-**

Similarly, the C-PACT full assessment contains 59 dynamic measures across the domains of school, use of free time, relationships, living arrangements, alcohol/drug use, current mental health, attitudes, aggression, and social skills. The 59 items are attributed risk and/or protective scores as per the C-PACT scoring protocol, meaning each of the eight dynamic domains has a domain risk

score and domain protective score. “Net Risk” scores were created for each domain by subtracting the percentage of possible protective points that the youth was attributed from the percentage of possible risk points the youth was attributed from that domain. Each domain net risk score, therefore, ranged from 100 (100% of possible risk points and 0% of possible protective points) to -100 (0% of possible risk points and 100% of possible protective points). This exact process is in keeping with a host of prior work examining changes in risk among FDJJ youth (e.g., Baglivio & Jackowski, 2015; Baglivio, Wolff, Jackowski, & Greenwald, 2017; Baglivio, Wolff, Piquero, DeLisi, & Vaughn, 2018). Next, similar to the prescreen sample, a preliminary exploratory factor analysis was undertaken to explore the associations present between each of the domains net risk scores. Results of this preliminary analysis suggested that all domains except for the domain on current mental health (Domain 9B) loaded satisfactorily on a single latent factor. Accordingly, each of these domain net risk scores (except for current mental health) were combined to create an additive index of total dynamic risk for each of the four full assessment points ( $\alpha = .830 - .836$  across waves).

## **Community Contextual Measures**

### **Social Disorganization-**

Social disorganization, is composed of seven zip code–level variables drawn from the ACS: the proportion of families living below the poverty line, median family income (logged and reverse coded), the proportion of female-headed households, the unemployment rate, proportion of the population who are non-Latino Black, percent renters, and proportion of the population who lived in the same household one year ago. The items were standardized and combined to form an additive index of neighborhood disadvantage ( $\alpha = .846$  for the prescreen sample,  $\alpha = .857$  for the full-screen sample). This construction concentrated disadvantage/ social disorganization has been leveraged in a host of prior work (e.g., Baumer, Messner, & Felson, 1998; Kubrin & Stewart, 2006; Morenoff,

Sampson, & Raudenbush, 2001), including studies examining juvenile recidivism in Florida (Baglivio, Wolff, Epps, & Nelson, 2017; Wolff, Baglivio, Piquero, Vaughn, & DeLisi, 2016).

### **Immigrant Concentration-**

Immigrant concentration is composed of three indicators that included percentage foreign born, percent Latino and percentage linguistically isolated. Each indicator was standardized and combined to create an immigrant concentration index ( $\alpha = .960$  for the prescreen sample,  $\alpha = .956$  for the full-screen sample), with higher values indicating more immigrant concentration. This construction is consistent with a host of prior work examining the association of immigrant concentration with crime and delinquency (Desmond & Kubrin, 2009; Lee et al., 2001; Reid, Weiss, Adelman, & Jaret, 2003; Sampson, Morenoff, & Raudenbush, 2005; Wolff et al., 2015).

### **Criminal History Covariates**

Key criminal history risk factors were included in multinomial models predicting trajectory group membership and predicting the three types of official recidivism (explained in the “Analytic Approach” section). Specifically, *age at first arrest* classified youth as under 13, 13-14, 15, 16, or over 16 at the time of their first arrest (coded 1-4, with higher values indicating an older age when first arrested). Whether the youth had adjudicated/adjudication withheld *felonies* classified youth according to having no, one, two, or three or more prior felonies (coded 1-4, with higher values indicating more prior felonies). The youth’s extent of adjudicated/adjudication withheld *against-person/violent felonies* distinguished youth with none, one, or two or more such felonies (coded 1-3). A history of *sexual felonies* captured those without and those who had at least one adjudicated/adjudication withheld sexual felony (predominately felony sexual battery, felony kidnapping with sexual offending, and other felony sexual offenses; coded 0-1). The extent of the youth’s prior *detention placements* where the youth was placed in a secure detention facility for at least 48 hours classified those without such histories, one such placement, two placements, and those with three or more such placements (coded 1-4, with higher values indicating more prior detention

placements). Lastly, the extent of prior long-term juvenile justice residential facility placements distinguished those without such placement history, those with one prior residential program, and those who have had two or more residential placements (coded 1-3, respectively).

### **Demographic Indicators**

Specific demographic controls included biological *sex* (male = 1), *age at completion* of the community-based placement (continuously measured), and dichotomous indicators of race and ethnicity where *Black* youth are non-Hispanic Black (= 1), and *Hispanic* youth are of Hispanic ethnicity and may be either Black or White race, as per FDJJ protocol (= 1). Non-Hispanic White youth serve as the reference category.

### **Analytic Approach**

The current project incorporates a diverse array of analytic approaches. First, we assess the temporal patterning of dynamic risk observed among youth while on community supervision using a semi-parametric group-based trajectory modeling approach (Nagin & Land, 1993). Group-based trajectory modeling (GBTM) is designed to identify clusters of individuals who are following similar trajectories of a single indicator of interest such as risk seeking or delinquent behavior (Nagin, Jones, Passos & Tremblay, 2018). This method allows us to explore the heterogeneity of individual patterns of risk during the youths' time under community supervision and determine whether youth follow a set number of specific temporal patterns or trajectories. We perform this analysis on two distinct sample of youth, first those with only C-PACT prescreen information (generally lower-risk youth) and then again with a sample of youth who were administered the full C-PACT assessment (generally a higher-risk sample of youth on community supervision).

Following Nagin's (2005) model selection process, we determine the optimal number of groups to include in the model mainly based on the Bayesian Information Criterion (BIC). The first stage of this process is to determine the number of trajectory groups present within the data. In the

second stage, the model is refined to determine the preferred order of the polynomial specifying the within-individual change for each trajectory. GBTM favors parsimony, so higher order polynomial functions will only improve model fit if they are truly providing a significantly better description of the data than lower order polynomial functions (Nagin, 2005). The results of this analysis provide (1) the probability that each youth belongs to a particular trajectory group, and (2) the assigned trajectory group based on the highest posterior probability. The posterior probabilities of assignment refer to the probability that an individual youth will be assigned to a given group based on the similarity of his or her individual developmental trajectory. When the average posterior probability of assignment (AvePP) is above 0.70 and the odds of correct classification (OCC) are greater than 5.0 for all groups, it indicates adequate model correspondence with the data (Nagin, 2005). These fit statistics, along with practical considerations such as parsimony and trajectory group size are used in tandem to decide on the final number of trajectories as well as their “shape” (intercept, linear, or quadratic). Fit statistics for each of the resulting GBTMs are detailed below in the results section.

After establishing the number of distinct trajectories present among this sample of youth on community supervision, we utilize a series of multilevel multinomial logistic regression models aimed at evaluating whether there is a significant association between community characteristics (levels of social disorganization and immigrant concentration) and the derived trajectories in risk. Using community-level data (measured at the ZIP Code Tabulation Area [ZCTA]) drawn from the American Community Survey, the goal of this second portion of the analysis is to assess which youth- and community-level characteristics are associated with membership in distinct trajectory groups (derived from the first set of analyses) while controlling for the nested nature of the data (see Jennings & Reingle, 2012; Baglivio et al., 2015). As youth are effectively placed into exclusive categories based on the predicted probability of group membership estimated by the GBTM, multilevel multinomial logistic regression represents the appropriate statistical model to assess the

influence of both individual- and community-level factors on the trajectory of risk/promotive factors during a youth's time supervision. In these analyses, trajectory group membership represents the outcome, while youth demographic and static risk factors, as well as community-level measures of social disorganization and immigrant concentration will serve as the independent variables.

Following the assessment of the relationship between community conditions and trajectory group membership we will assess the potential for these varying trajectories in risk to be associated with continued delinquent behavior both during supervision and after its completion (1-year post-completion) using a variety of methods. To test the association between group membership, community context and our measures of juvenile recidivism (rearrest, readjudication, and reincarceration) we use multilevel logistic regression. This analytic technique allows us to assess the relationship between community conditions and membership in a particular risk trajectory while controlling for several individual-level characteristics such as age, race, gender as well static risk factors. Given each of the focal outcomes is binary (0/1) as well as the hierarchical nature of the data (youth nested within ZCTAs), logistic regression represents most appropriate analytic strategy. This approach has been used in past research to test the association between community conditions and juvenile recidivism and is capable of accounting for the non-independence of the observations included in the model (see Wolff et al., 2016; Wright et al., 2014).

Finally, dual-trajectory modeling (Nagin, Jones, Passos, & Tremblay, 2018) will be used to assess trajectories in net risk across two different domains individually to examine whether changes in one risk factor are associated with changes in another. This strategy allows us to explore whether net risk in two separate domains (e.g., risk in current school status and risk in antisocial attitudes), evolve in a similar fashion “by defining a trajectory group in terms of trajectories for multiple outcomes not just one outcome” (Nagin et al., 2018, p. 2021). This analysis will provide the number of distinct trajectory groups of juvenile offenders with respect to considering risk changes across

two dynamic domains, in tandem. It is possible that dramatic improvements (or declines) in net risk within a given domain are driven by (or are concurrent with) changes in other domains. To complete this analysis trajectories are identified in each specified domain separately. Second, a dual trajectory model is estimated. Following Nagin and Tremblay (2001), the final joint model is estimated based on the number and shapes of trajectories identified in the first step of analysis. Key outputs of a joint model are the conditional and joint probabilities of trajectory membership across two distinct but related behaviors, which are useful in describing the co-occurrence of the individual domains explored.

In the section that follows we detail the results for each of the samples under study. First, we describe the estimation of the group-based trajectory models as well as the resulting trajectories in dynamic risk among youth serving a community placement in the state of Florida. Following this, we explore the factors associated with trajectory-group membership and their relationship to continued delinquency. This report closes with a discussion of the implication stemming from the results for future research and juvenile justice policy.

## **Results**

### **Prescreen Sample**

The first step in the analysis was to establish the number of distinct trajectories in dynamic risk among each sample of youth analyzed. The first sample under investigation in the current study included 7,117 youth with four C-PACT prescreen assessments during their time on community supervision.

### **Establishing Trajectories in Global Risk-**

The first step in the analysis was to establish the number of distinct trajectories in dynamic risk among the youth in the analysis sample. As described to above, in order to do this, we estimated a



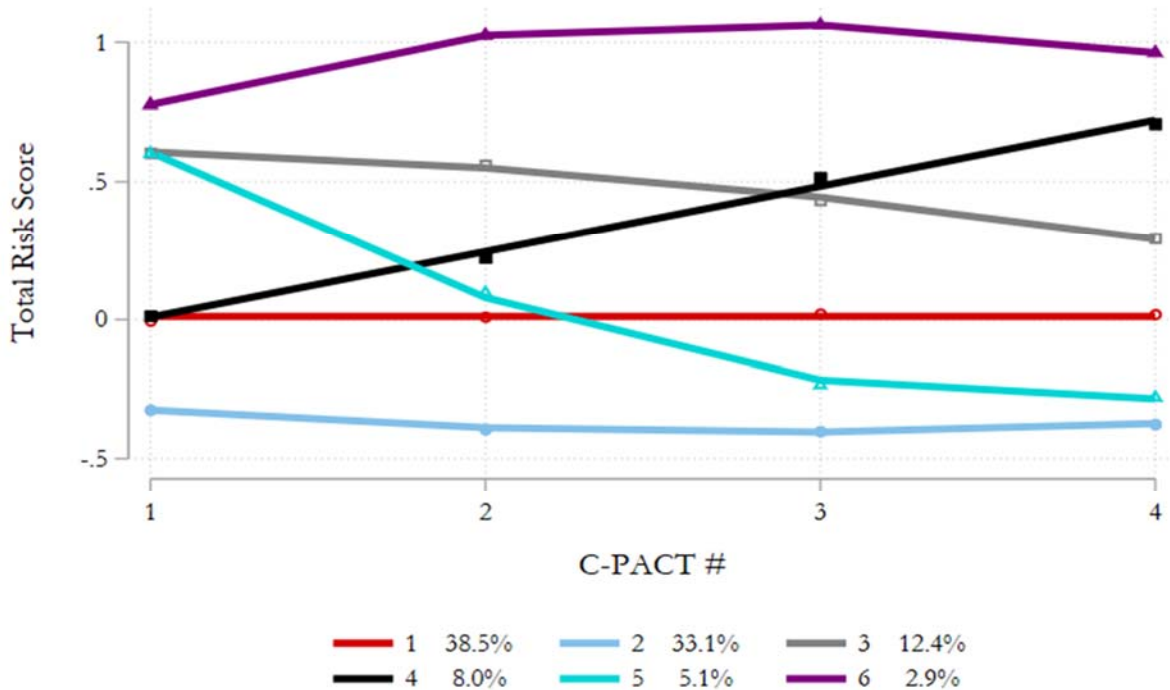
number of semi-parametric group-based trajectory models (GBTMs). For the GBTMs estimated, an uncensored normal (CNORM) model was selected in due to the continuous nature of the outcome measure of global risk, with minimum and maximum values specified outside the range of observed values. Next, the number of groups and the shape of the trajectory (e.g. flat (0), linear (1), and quadratic (2)) for each group were iteratively specified.<sup>1</sup>) Due to limited a priori knowledge of the potential number of trajectory subgroups, the number of groups and each group's polynomial order estimated as a quadratic function. The optimal number of groups to be estimated was determined based on changes in Bayesian information criteria (BIC) values between models. BIC is a measure of model fit, with higher (less negative) numbers indicating an improved model fit (Nagin, 2005). Importantly, the BIC may not always clearly indicate the optimal number of groups and order of polynomials for each trajectory, and in such cases, parsimony should be balanced with the objective of reporting trajectories with substantive and meaningful differences as well as an adequate share of the sample being analyzed (>5%). Following the selection of the optimal number of groups and polynomial order for each group, the final model fit was assessed using (a) average posterior probability (AvePP) (group assignment probability) >0.7, and (b) odds of correct classification (OCC) >5).

For the prescreen sample of youth, a total of six distinct trajectories proved to best fit the data. Each of the trajectories shown in Figure 1 represent unique patterns of changes in the total risk score during community placement (Figure 1). For ease of interpretation, the trajectories were labeled according to their relative level and degree of change across measurement periods. Group 1 comprised the largest proportion of the sample (38.5%) and can be described as moderate risk and stable. Group 2, which also represented a sizeable proportion of the youth (33.1%) was low risk and

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<sup>1</sup> Although it is possible to include higher-order polynomial terms within the GBTM, given the limited number of temporal observations in the current study, the complexity of the models was limited by utilizing only a quadratic term.

relatively stable between C-PACT assessments. Group 3, which comprised 12.4% of the youth, began with moderate-to-high levels or risk, but were observed to decrease in total risk between assessments. Group 4, at 8% of the sample, trended in an opposite direction and increased from moderate risk to high risk between their first and fourth assessment. On the other hand, Group 5 (5.1%) started with a moderate-to-high degree of risk, but declined rather substantially over the period examined. The final group, which comprised just 2.9% of the sample was comprised of high-risk youth that remained high risk across the 4 assessment periods.<sup>2</sup>



**Figure 1: Trajectories in total risk among youth on community supervision in Florida.**

<sup>2</sup> Although smaller than the traditional cutoff of 5% of the full sample, this group was present in models with fewer trajectory groups, suggesting it is a meaningful and distinct group of youth among this sample.

**Table 2: Descriptive Statistics for Analysis of Dynamic Risk and Juvenile Recidivism, Prescreen Sample**

	Full Sample	Trajectory Group 1	Trajectory Group 2	Trajectory Group 3	Trajectory Group 4	Trajectory Group 5	Trajectory Group 6
	All Youth	Moderate Risk & Stable	Low-Risk & Stable	Mod-High Risk & Declining	Moderate Risk & Increasing	Mod-High Risk & Rapidly Decreasing	High-Risk & Stable
	% / Mean (SD)	% / Mean (SD)	% / Mean (SD)	% / Mean (SD)	% / Mean (SD)	% / Mean (SD)	% / Mean (SD)
Rearrested	51.6%	56.7%	40.7%	54.3%	70.6%	47.6%	52.0%
Readjudicated	35.9%	39.7%	28.1%	36.5%	52.6%	32.7%	34.3%
Reincarcerated	10.5%	11.5%	7.1%	11.2%	20.2%	8.2%	13.6%
Male	79.3%	79.4%	83.5%	72.3%	78.7%	72.8%	68.2%
Age at Release	17.11 (1.68)	17.10 (1.71)	17.22 (1.62)	17.14 (1.62)	16.81 (1.75)	16.89 (1.63)	17.07 (1.88)
White	30.7%	29.0%	29.4%	35.7%	31.8%	37.4%	35.9%
Black	54.8%	56.4%	57.3%	47.7%	52.9%	48.0%	47.0%
Hispanic	12.6%	14.7%	13.3%	16.7%	15.3%	14.6%	17.2%
Age at First Offense							
12 and Under	23.9%	24.5%	22.8%	23.8%	24.0%	24.5%	29.3%
13-14	41.5%	41.8%	40.4%	42.0%	45.8%	38.4%	39.9%
15	19.4%	18.7%	19.1%	19.7%	21.0%	25.9%	19.7%
16	15.2%	15.1%	17.7%	14.5%	9.1%	11.2%	11.1%
Prior Felony Referrals							
0	32.6%	33.3%	28.9%	35.7%	36.9%	33.0%	39.4%
1	43.2%	42.3%	47.4%	40.7%	36.9%	40.5%	37.9%
2	14.2%	13.9%	13.8%	14.7%	15.3%	16.0%	16.2%
3+	10.1%	10.6%	9.9%	9.0%	10.9%	10.5%	6.6%

Prior Against-Person Felony Referrals							
Zero	73.3%	74.6%	69.9%	74.7%	78.0%	76.2%	71.2%
One	25.7%	24.3%	29.4%	24.4%	20.0%	22.1%	28.8%
Two or More	1.0%	1.2%	0.7%	0.9%	2.0%	1.7%	0.0%
Prior Sexual Felony Referrals							
Zero	94.7%	96.7%	90.0%	96.9%	98.4%	95.9%	98.0%
One	5.3%	3.3%	10.0%	3.1%	1.6%	4.1%	2.0%
Prior Secure Detention Stays							
Zero	64.5%	63.7%	67.7%	62.9%	63.5%	59.9%	56.1%
One	19.7%	19.5%	19.9%	21.1%	14.5%	23.8%	21.7%
Two	6.5%	7.3%	4.9%	6.7%	8.1%	7.5%	7.6%
Three or More	9.3%	9.5%	7.5%	9.3%	13.9%	8.8%	14.7%
Prior Residential Placement							
Zero	87.9%	87.2%	86.3%	95.0%	83.7%	93.5%	86.9%
One	10.4%	11.1%	12.1%	4.0%	12.3%	5.1%	10.6%
Two or More	1.8%	1.8%	1.6%	1.0%	4.0%	1.4%	2.5%
Community- Level Measures							
Social Disorganization	.460 (.798)	.500 (.802)	.436 (.797)	.430 (.788)	.478 (.779)	.332 (.815)	.443 (.764)
Immigrant Concentration	.033 (.840)	.043 (.829)	-.042 (.781)	.093 (.889)	.121 (.846)	.129 (.960)	.147 (.119)
N	7,117	2,880	2,349	892	504	294	198

Table 2 provides comparisons on demographic, criminal history, and individual risk factors (as assessed at the beginning of their community supervision placement) across trajectory groups derived among the prescreen sample. Of note, Group 2 had the highest proportion of males (83.5%) and Black youth (57.3%), while Group 6 had the highest proportion of Hispanic youth (17.2%). In terms of recidivism, Group 4 (moderate risk and increasing) stood out, with the highest incidence of rearrest (70.6%), readjudication (32.7%) and reincarceration (20.2%) among the groups being compared. It is also important to note that this group had higher levels of dynamic risk than the high-risk group (Group 6) but recidivated at a higher level.

### **Predicting Trajectory Membership-**

A major aim of the current study is to examine the youth- and community-level characteristics associated with trajectory group membership. As such, multinomial logistic regression was used to examine which demographic, criminal history, and individual-level risk factors (as assessed at intake) which distinguish total dynamic risk trajectory group membership. Results for the prescreen sample are presented in Table 3.

For this analysis, Group 2 (low-risk and stable) represents the reference category. It is also important to recall that the level of risk being described here is based solely on the dynamic items comprising the dynamic risk index, and does not necessarily represent to total risk-to-recidivate as established by the PACT assessment. This is because the criminal history measures included in the traditional scoring of the tool are not included in our index of dynamic risk as they are considered static (can only increase over time).

Results indicate that males (RRR = .83 CI = .72 - .96) and Black youth (RRR = .82, CI = .71 - .95) are less likely to belong to Group 1, characterized by moderate levels of dynamic risk and stable over time, as were youth with prior sexual offending histories (RRR = .31 CI = .24 - .41) and youth with a history of residential placement (RRR = .83 CI = .70 - .99). Youth with a greater

number of stays in secure detention were more likely to be assigned to Group 1 (RRR = 1.27 CI = 1.17 - 1.37), as were youth from communities characterized by higher levels of social disorganization (RRR = 1.10 CI = .1.01 - 1.20) and/or immigrant concentration (RRR = 1.15 CI = .1.05 - 1.26).

Males were also significantly less likely to belong to Group 3 (moderate-to-high risk and declining), Group 5 (moderate-to-high risk and rapidly declining), and Group 6 (high risk and stable). Overall this suggests that females in this sample likely exhibit higher levels of total dynamic risk as measured by the items on the prescreen and potentially exhibit greater variation over time. Similarly, Black youth were less likely to be assigned to any of the trajectory groups outside the reference category (low risk and stable). Youth who were older at the time of completion were less likely to belong to Group 4 (moderate risk and increasing) as well as Group 5 (moderate-high risk and rapidly decreasing), suggesting younger youth may evidence more variability in total dynamic risk than older youth among this sample. In general, indicators of more extensive criminal histories (i.e. prior felony referrals, prior sexual felony referrals and prior residential placement) were negatively associated with belonging to a group outside of the reference category. However, prior secure detention stays area positively associated with membership in each of the groups with a greater degree of total dynamic risk. These somewhat contradictory findings suggest that youth which greater dynamic risk cycle in and out of secure detention more often, even if these youth with greater dynamic risk are not necessarily those with the most prior offenses. In terms of community characteristics, levels of social disorganization were only associated with the likelihood of being assigned to Group 1 (over Group 2), while higher levels of immigrant concentration were positively associated with memberships in each of the groups explored, suggesting that youth from these areas likely exhibit higher levels of dynamic risk than youth in the reference category (Group 2).

**Table 3: Multivariable Multinomial Logistic Analysis of Trajectory Group Membership  
(n = 7,117)**

	Trajectory Group 1 Moderate Risk & Stable	Trajectory Group 3 Mod-High Risk & Declining	Trajectory Group 4 Moderate Risk & Increasing	Trajectory Group 5 Mod-High Risk & Rapidly Decreasing	Trajectory Group 6 High Risk & Stable
	RRR / 95% CI	RRR / 95% CI	RRR / 95% CI	RRR / 95% CI	RRR / 95% CI
Male	.829* [.716,.960]	.558*** [.452,.690]	0.801 [.617,1.038]	.518*** [.381,.706]	.499*** [.356,.701]
Age at Release	0.971 [.932,1.011]	1.01 [.954,1.069]	.864*** [.806,.926]	.894** [.829,.965]	0.987 [.885,1.100]
Black	.819** [.706,.951]	.551*** [.449,.676]	.683** [.526,.887]	.616** [.443,.856]	.505*** [.351,.729]
Hispanic	0.925 [.752,1.138]	0.801 [.620,1.035]	0.778 [.543,1.116]	.645* [.427,.975]	0.761 [.482,1.203]
Age at First Offense	0.944 [.879,1.015]	.903* [.817,.998]	0.944 [.840,1.061]	0.985 [.853,1.136]	.827* [.689,.993]
Prior Felony Referrals	.907* [.841,.978]	0.92 [.819,1.034]	.817** [.718,.929]	1.048 [.887,1.239]	.651*** [.522,.813]
Prior Against-Person Felony Referrals	1.009 [.871,1.167]	1.071 [.875,1.311]	0.915 [.713,1.173]	0.905 [.645,1.270]	1.315 [.944,1.832]
Prior Sexual Felony Referrals	.312*** [.239,.406]	.297*** [.187,.471]	.157*** [.074,.334]	.443* [.236,.831]	.168*** [.061,.462]
Prior Secure Detention Stays	1.267*** [1.168,1.374]	1.517*** [1.354,1.700]	1.401*** [1.226,1.600]	1.516*** [1.278,1.799]	1.748*** [1.462,2.089]

Prior Residential Placement	.833* [.699,.993]	.277*** [.194,.394]	1.24 [.912,1.685]	.366*** [.212,.632]	0.739 [.470,1.161]
Social Disorganization	1.102* [1.011,1.200]	1.054 [.916,1.212]	1.07 [.908,1.261]	0.847 [.694,1.035]	1.05 [.836,1.319]
Immigrant Concentration	1.148** [1.049,1.257]	1.238*** [1.098,1.396]	1.340*** [1.161,1.547]	1.394*** [1.195,1.625]	1.379*** [1.143,1.664]
Constant	3.211*** [1.649,6.253]	2.196 [.871,5.534]	3.543* [1.129,11.117]	3.642 [.975,13.608]	0.399 [.069,2.297]

Note: \* p < .05, \*\* p < .01, \*\*\* p < .001. Group 2 (Low-Risk & Stable) represents reference category. Relative-Risk Ratios (RRR) and 95% confidence intervals shown.



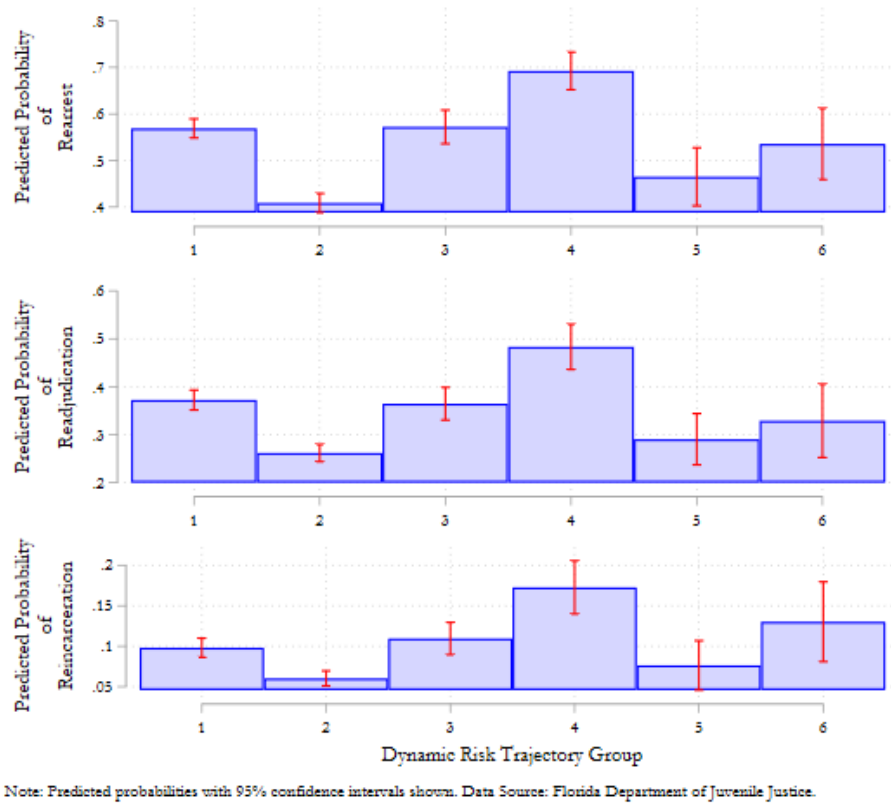
As a whole, results shown in Table 3 suggest that dynamic risk (as measured by the 16 items in the prescreen assessment) is relatively distinct from traditional indicators of risk, especially indicators of serious prior offending. Total dynamic risk also appears to be elevated among groups who do not typically score the highest on overall risk-to-reoffend as male and Black youth (traditionally higher risk) were most likely to fall in Group 2, characterized by low dynamic risk exhibiting stability over time. The question becomes, then, is group membership significantly associated with measures of recidivism? A question we turn to next.

### **Association between Trajectory Group & Recidivism-**

The final step in our analysis examines whether total dynamic risk trajectories were related to subsequent recidivism post completion of community supervision. To answer this question, we use a series of multivariable logistic regression models to assess the association between trajectory group membership and three measures of recidivism, while also controlling for a host of demographic and criminal history variables as well as neighborhood characteristics. Importantly, these models also account for the clustering of youth within communities across the state by relying on the calculation of clustered standard errors. In each of the three models shown in Table 4, Group 2 again represents the reference category, so that all comparisons are being made to the group of youth with the lowest levels of total dynamic risk who exhibited stability across the four assessment periods.

In comparison to youth in the reference category, youth who were assigned to all but Group 5 (moderate-to-high risk with significant decreases) were more likely to be rearrested, rejudicated, and reincarcerated within one year of their community placement. Importantly, those youth in Group 4 (moderate risk and increasing) exhibited the largest differences in recidivism, consistent with the descriptive statistics presented earlier with estimated odds ratios ranging from 2.6 to 3.2. This suggests those youth who evidence higher levels or increases in total dynamic risk are at the greatest risk of further delinquent behavior. The results of these logistic regression models are

presented graphically in Figure 2, which display predicted probabilities of recidivism for each group, controlling for all confounding measures included in the regression models.



**Figure 2: Predicted probability of recidivism by trajectory group (prescreen sample).**

Among the controls included in Table 4, and consistent with past research on juvenile recidivism, male youth, Black and Hispanic youth, and those with prior residential placement histories were more likely to recidivate in comparison to their counterparts. Youth who were older at the time of completion of the community-based disposition were less likely to be recidivate as were youth with sexual offending histories (non-significant association with reincarceration). As with much of the research on juvenile recidivism, evidence regarding a significant association between community characteristics and continued delinquency is limited, with only one significant and positive association found between levels of immigrant concentration in the community and being rearrested within 365 days of completing community supervision.

**Table 4: Multivariable Logistic Regression Analysis of Juvenile Recidivism and Trajectory Group Membership (n = 7,117)**

	Rearrest OR/95% CI	Readjudication OR/95% CI	Reincarceration OR/95% CI
Traj Group 1- Moderate Risk & Stable	1.910*** [1.703,2.142]	1.673*** [1.478,1.892]	1.697*** [1.400,2.057]
Traj Group 3- Mod-High Risk & Declining	1.936*** [1.641,2.284]	1.618*** [1.359,1.926]	1.917*** [1.477,2.488]
Traj Group 4- Moderate Risk & Increasing	3.257*** [2.648,4.007]	2.636*** [2.137,3.252]	3.254*** [2.468,4.290]
Traj Group 5- Mod-High Risk & Rapidly Decreasing	1.258 [.967,1.638]	1.155 [.879,1.517]	1.289 [.816,2.037]
Traj Group 6- High-Risk & Stable	1.669** [1.208,2.306]	1.382 [.955,2.001]	2.334*** [1.474,3.697]
Male	1.695*** [1.497,1.919]	1.579*** [1.383,1.802]	2.538*** [2.004,3.215]
Age at Release	.634*** [.607,.661]	.573*** [.549,.597]	.928** [.878,.980]
Black	1.655*** [1.446,1.893]	1.429*** [1.242,1.643]	1.753*** [1.396,2.201]
Hispanic	1.393*** [1.168,1.662]	1.343** [1.122,1.607]	1.241 [.926,1.661]
Age at First Offense	1.197*** [1.129,1.269]	1.314*** [1.231,1.404]	.942 [.851,1.042]
Prior Felony Referrals	1.062 [.984,1.147]	1.069 [.988,1.158]	1.148** [1.041,1.267]
Prior Against-Person Felony Referrals	.915 [.813,1.031]	.866* [.760,.987]	.877 [.736,1.046]
Prior Sexual Felony Referrals	.384*** [.283,.520]	.361*** [.243,.536]	.714 [.452,1.127]

Prior Secure Detention Stays	1.092* [1.016,1.172]	1.063 [.986,1.146]	1.256*** [1.142,1.381]
Prior Residential Placement	1.591*** [1.360,1.861]	1.548*** [1.308,1.833]	1.285* [1.042,1.584]
Social Disorganization	.954 [.883,1.030]	.925 [.854,1.002]	.977 [.850,1.122]
Immigrant Concentration	1.094** [1.022,1.172]	.937 [.872,1.008]	.895 [.791,1.013]
Constant	294.436*** [150.218,577.115]	930.085*** [492.124,1757.803]	.043*** [.019,.102]

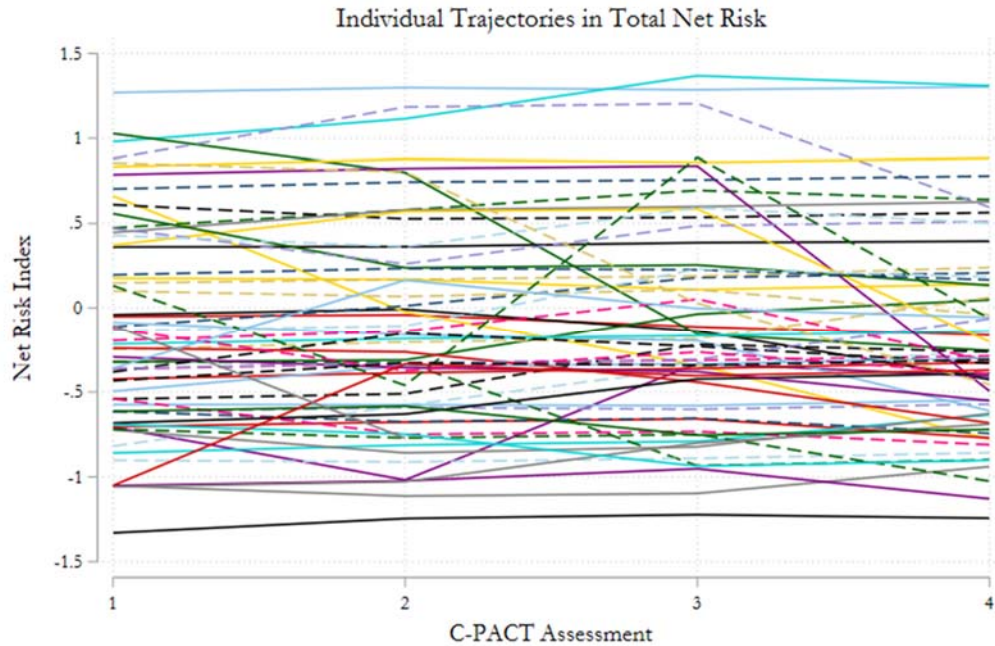
Note: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ . Odds Ratios (OR) and 95% confidence intervals shown with clustered standard errors in order to account for clustering of youth within specific communities.

Taken as a whole, the results presented in the preceding section suggest that youth can be classified into a number of meaningful groups characterized by different patterns in total dynamic risk during their time on community supervision. However, the majority of youth were classified into groups with very little evidence of change over time, and could only be differentiated by levels of dynamic risk (i.e., low vs moderate, vs high). However, a number of smaller, more dynamic groups were uncovered, and importantly these groups exhibited meaningful differences in continued delinquent activity after accounting for a host of other demographic and criminal history risk factors. Prior to discussing these results in more detail, we turn to our results on dynamic risk using a fuller battery of dynamic items drawn from a sample of youth assessed with the full-screen C-PACT risk assessment tool.

### **Full-Screen Sample**

The second sample under investigation in the current study included 2,877 youth with four C-PACT full-screen assessments during their time on community supervision. Similar to the results presented above for the larger, pre-screen sample, the C-PACT full assessment contains 59 dynamic measures across the domains of school, use of free time, relationships, living arrangements, alcohol/drug use, current mental health, attitudes, aggression, and social skills. The 59 items are attributed risk and/or protective scores as per the C-PACT scoring protocol, resulting in a total of the eight dynamic domains each with a respective risk score and protective score. From these risk and protective scores, “Net Risk” scores were created for each domain by subtracting the percentage of possible protective points that the youth was attributed from the percentage of possible risk points the youth was attributed from that domain. Each domain net risk score, therefore, ranged from 100 (100% of possible risk points and 0% of possible protective points) to -100 (0% of possible risk points and 100% of possible protective points). Following the calculation of net risk

scores for each domain, an exploratory factor analysis was undertaken to explore the associations present between each of the domain net risk scores. Results of this preliminary analysis suggested that all domains except for the domain assessing current mental health (Domain 9B) loaded satisfactorily on a single latent factor. Accordingly, each of these domain net risk scores (except for current mental health) were combined to create an additive index of total dynamic risk for each of the four full assessment points ( $\alpha = .830 - .836$ ). Figure 2 displays a total of the patterning of total net risk among 200 different youth in the sample under study. It is these data that are included in the GBTMs and other analyses described below.



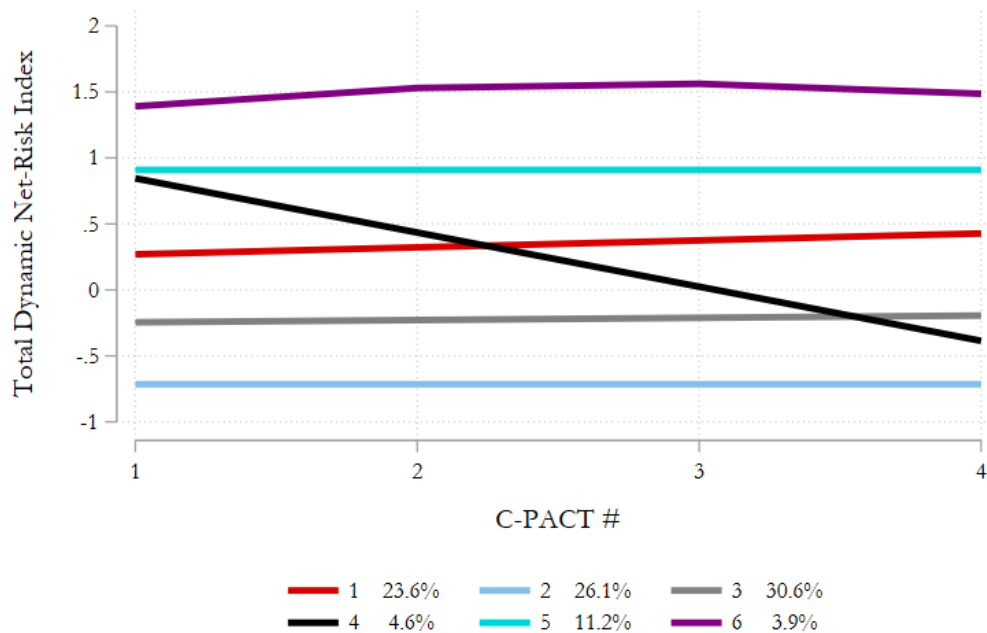
**Figure 3: Individual Trajectories in Total Net Risk**

#### **Establishing Trajectories in Total Net Risk-**

All steps undertaken to determine trajectory groups among the prescreen sample were repeated using the full-screen youth. This analysis resulted in a total of six distinct trajectories in total risk among the sample of 2,877 youth. Each of the six resulting trajectories are shown in Figure 3. In general, it is observed that the resulting trajectories are much more stable than those demonstrated

among the prescreen sample/items. While groups differed in terms of risk levels, there is only one group which evidences any kind of substantial change between the first and last assessment.

Group 1 comprised the third largest proportion of the sample (23.4%) and can be described as moderate risk with slight increases between the first and fourth assessment. Group 2, which represented the second largest proportion of the youth (25.9%) was low risk and stable between C-PACT assessments. Group 3, the largest group, which comprised 30.8% of the youth can be categorized as moderate-to-low risk and stable. Group 4, at 4.9% of the sample was the only resultant group that evidenced any substantial change over the period, moving from moderate-to-high risk to much lower levels of risk by the fourth assessment (indicating substantial improvement in risk reduction and protective enhancement over time). Group 5 (moderate-to-high risk and stable; 11.3%) and Group 6 (high risk and stable; 3.8%), on the other hand, evidence a much greater deal of stability across the four assessments. Descriptive statistics for the sample as a whole, as well as for each of the trajectory groups individually are presented in Table 5.



**Figure 4: Trajectories in total net risk among full-screen youth.**

Table 5: Descriptive Statistics for Analysis of Dynamic Risk and Juvenile Recidivism

	Full Sample	Trajectory Group 1	Trajectory Group 2	Trajectory Group 3	Trajectory Group 4	Trajectory Group 5	Trajectory Group 6
	All Youth	Moderate Risk Slightly Increasing	Low Risk & Stable	Low-Moderate Risk & Relatively Stable	Moderate-High Risk & Rapidly Declining	Moderate-High Risk & Stable	High Risk & Stable
	% / Mean (SD)	% / Mean (SD)	% / Mean (SD)	% / Mean (SD)	% / Mean (SD)	% / Mean (SD)	% / Mean (SD)
Rearrested	52.2%	56.0%	47.1%	53.4%	46.0%	55.1%	52.3%
Readjudicated	33.2%	38.9%	27.7%	33.7%	28.6%	35.3%	30.3%
Reincarcerated	16.6%	17.7%	14.2%	17.6%	10.3%	19.2%	15.6%
Male	82.1%	78.4%	87.6%	83.2%	80.1%	76.5%	75.2%
Age at Release	17.4 (1.5)	17.2 (1.5)	17.7 (1.5)	17.5 (1.5)	17.0 (1.5)	17.0 (1.6)	17.1 (1.6)
White	30.3%	30.9%	29.0%	28.6%	31.8%	34.1%	36.7%
Black	56.6%	57.2%	58.5%	58.2%	49.2%	52.3%	46.8%
Hispanic	13.1%	11.9%	12.5%	13.2%	19.0%	13.6%	16.5%
Age at First Offense							
12 and Under	34.6%	35.2%	34.3%	34.7%	34.9%	33.1%	34.9%
13-14	43.0%	41.8%	41.0%	45.8%	42.9%	41.5%	45.9%
15	14.3%	15.2%	15.0%	12.8%	15.9%	14.9%	11.0%
16	8.2%	7.8%	9.7%	6.7%	6.3%	10.5%	8.2%
Prior Felony Referrals							
Zero	13.0%	13.8%	8.0%	11.5%	17.5%	20.7%	27.5%
One	31.6%	34.2%	27.6%	30.1%	38.1%	35.0%	36.7%
Two	24.2%	25.5%	24.9%	23.0%	23.8%	24.2%	22.0%
Three or More	31.2%	26.5%	39.5%	35.4%	20.6%	20.1%	13.8%
Prior Against-Person Felony Referrals							
Zero	57.3%	59.1%	51.6%	56.5%	61.1%	64.1%	67.0%
One	39.7%	36.9%	45.6%	40.2%	38.1%	34.0%	30.3%
Two or More	3.0%	4.0%	2.8%	3.3%	0.8%	1.9%	2.7%



Prior Sexual Felony Referrals							
Zero	95.2%	97.2%	92.1%	95.0%	98.4%	96.6%	98.2%
One	4.8%	2.8%	7.9%	5.0%	1.6%	3.4%	1.8%
Prior Secure Detention Stays							
Zero	26.1%	26.6%	24.9%	24.4%	32.5%	28.2%	31.2%
One	24.4%	25.2%	22.9%	21.9%	27.8%	29.1%	33.0%
Two	18.5%	19.5%	17.4%	18.5%	19.1%	17.6%	22.0%
Three or More	31.0%	28.7%	34.8%	35.1%	20.6%	25.1%	13.8%
Prior Residential Placement							
Zero	63.4%	75.8%	39.8%	57.3%	91.3%	89.2%	89.9%
One	29.9%	19.3%	49.2%	35.0%	7.1%	9.3%	9.2%
Two or More	6.7%	4.9%	11.0%	7.7%	1.6%	1.5%	0.9%
Community-Level Measures							
Social							
Disorganization	.410 (.808)	.449 (.837)	.397 (.823)	.432 (.787)	.298 (.747)	.373 (.793)	.327 (.798)
Immigrant Concentration	-.013 (.851)	.005 (.849)	-.067 (.782)	-.018 (.822)	.155 (1.09)	-.004 (.944)	.056 (.936)
N	2,877	682	752	885	126	323	109

Table 6: Multivariable Multinomial Logistic Analysis of Trajectory Group Membership - Full-screen Sample (n = 2,877)

	Trajectory Group 1 Moderate Risk Slightly Increasing RRR / 95% CI	Trajectory Group 3 Low-Moderate Risk & Relatively Stable RRR / 95% CI	Trajectory Group 4 Moderate-High Risk & Rapidly Declining RRR / 95% CI	Trajectory Group 5 Moderate-High Risk & Stable RRR / 95% CI	Trajectory Group 6 High Risk & Stable RRR / 95% CI
Male	.662** [.493,.888]	.789 [.582,1.071]	.802 [.480,1.340]	.649* [.449,.939]	.699 [.414,1.180]
Age at Release	.906* [.839,.978]	.960 [.893,1.033]	.879 [.766,1.009]	.860** [.779,.948]	.932 [.802,1.083]
Black	0.806 [.607,1.069]	.939 [.727,1.214]	.780 [.490,1.241]	.742 [.525,1.048]	.615 [.364,1.040]
Hispanic	0.763 [.504,1.154]	.986 [.685,1.420]	1.082 [.536,2.185]	.836 [.481,1.451]	.874 [.449,1.701]
Age at First Offense	0.936 [.824,1.064]	.883* [.782,.998]	.865 [.685,1.093]	1.016 [.869,1.187]	.808 [.627,1.042]
Prior Felony Referrals	.838** [.741,.947]	.903 [.803,1.014]	.777* [.631,.956]	.745*** [.632,.878]	.598*** [.455,.785]
Prior Against-Person Felony Referrals	1.119 [.908,1.379]	.980 [.801,1.199]	1.125 [.763,1.659]	1.021 [.771,1.352]	1.143 [.728,1.794]
Prior Sexual Felony Referrals	.393*** [.228,.677]	.701 [.442,1.111]	.216* [.049,.946]	.551 [.258,1.173]	.249 [.057,1.092]
Prior Secure Detention Stays	1.373*** [1.220,1.545]	1.249*** [1.119,1.394]	1.366** [1.109,1.682]	1.562*** [1.352,1.805]	1.346** [1.110,1.632]
Prior Residential Placement	.282*** [.222,.358]	.553*** [.457,.669]	.101*** [.050,.201]	.113*** [.073,.173]	.128*** [.063,.259]
Social Disorganization	1.164 [1.000,1.355]	1.086 [.941,1.253]	.909 [.714,1.157]	1.098 [.900,1.341]	1.025 [.759,1.385]
Immigrant Concentration	1.109 [.950,1.295]	1.055 [.919,1.212]	1.300* [1.019,1.657]	1.107 [.879,1.395]	1.217 [.956,1.550]

Constant	37.877***	7.690**	51.316***	133.945***	33.629**
	[9.808,146.276]	[2.202,26.854]	[5.174,508.972]	[25.237,710.895]	[2.461,459.528]

Note: \* p < .05, \*\* p < .01, \*\*\* p < .001. Group 2 (Low-Risk & Stable) represents reference category. Relative-Risk Ratios (RRR) and 95% confidence intervals shown.

### **Predicting Trajectory Membership-**

As above, the next step in our analysis was to determine which youth- and community-level characteristics were associated with trajectory group membership. Table 6 presents the results of a multinomial logistic regression model, where group 2 (low risk and stable) represents the reference category. In general, there are far fewer statistically significant results observed among the full-screen sample of youth. Male and older youth were less likely to belong to Group 1 (Moderate risk and slightly increasing) as well as Group 5 (moderate-to-high risk and stable). This again suggests that female and younger youth are likely to exhibit higher levels of dynamic risk. There were no racial differences observed across groups. Youth with prior sexual felony referrals were far less likely to be assigned to Group 1 and Group 4. Youth with a greater number of secure detention stays were significantly more likely to belong to each of the higher-risk trajectory groups as compared the reference group. Finally, youth residing in communities with higher levels of immigrant concentration were more likely to fall in Group 4 (moderate-to-high risk and declining).

### **Association between Trajectory Group & Recidivism-**

The final step in our analysis examines whether total net risk trajectories were related to subsequent recidivism post completion of community supervision. Again, we use logistic regression to assess the association between trajectory group membership and subsequent delinquency, while controlling for a number of demographic, criminal history, and community-level measures. Results of this analysis are presented in Table 7.

Table 7: Multivariable Logistic Regression Analysis of Juvenile Recidivism and Trajectory Group Membership - Full-screen Sample (n = 2,877)

	Rearrest OR/95% CI	Readjudication OR/95% CI	Reincarceration OR/95% CI
Traj Group 1- Moderate Risk & Slightly Increasing	1.701*** [1.349,2.145]	1.746*** [1.350,2.259]	1.533** [1.121,2.095]
Traj Group 3- Moderate Risk & Stable	1.389** [1.140,1.694]	1.347** [1.075,1.687]	1.376* [1.048,1.807]
Traj Group 4- Mod-High Risk & Rapidly Decreasing	1.197 [.787,1.820]	1.081 [.679,1.721]	.867 [.457,1.647]
Traj Group 5- Mod-High Risk & Stable	1.795*** [1.328,2.426]	1.503** [1.114,2.026]	1.802** [1.222,2.658]
Traj Group 6- High-Risk & Stable	1.705* [1.111,2.618]	1.277 [.761,2.141]	1.565 [.879,2.787]
Male	1.758*** [1.416,2.182]	1.644*** [1.297,2.085]	2.883*** [1.974,4.212]
Age at Release	.810*** [.766,.857]	.688*** [.646,.732]	.803*** [.741,.870]
Black	1.563*** [1.287,1.900]	1.486*** [1.215,1.817]	1.642*** [1.266,2.129]
Hispanic	1.260 [.984,1.614]	1.244 [.946,1.636]	1.395 [.972,2.004]
Age at First Offense	.994 [.907,1.089]	1.115* [1.008,1.232]	1.047 [.918,1.194]
Prior Felony Referrals	1.079 [.979,1.190]	1.108* [1.009,1.218]	1.143* [1.014,1.287]
Prior Against-Person Felony Referrals	.988 [.840,1.162]	.929 [.797,1.084]	.845 [.691,1.034]
Prior Sexual Felony Referrals	.718 [.500,1.033]	.677 [.446,1.029]	.821 [.489,1.379]
Prior Secure Detention Stays	1.128** [1.040,1.223]	1.117* [1.025,1.217]	1.174** [1.051,1.313]
Prior Residential Placement	1.493*** [1.261,1.767]	1.284** [1.089,1.515]	1.329** [1.092,1.617]
Social Disorganization	.980 [.884,1.086]	.965 [.869,1.072]	.968 [.846,1.108]
Immigrant Concentration	.997 [.916,1.085]	.919 [.826,1.022]	.899 [.789,1.024]

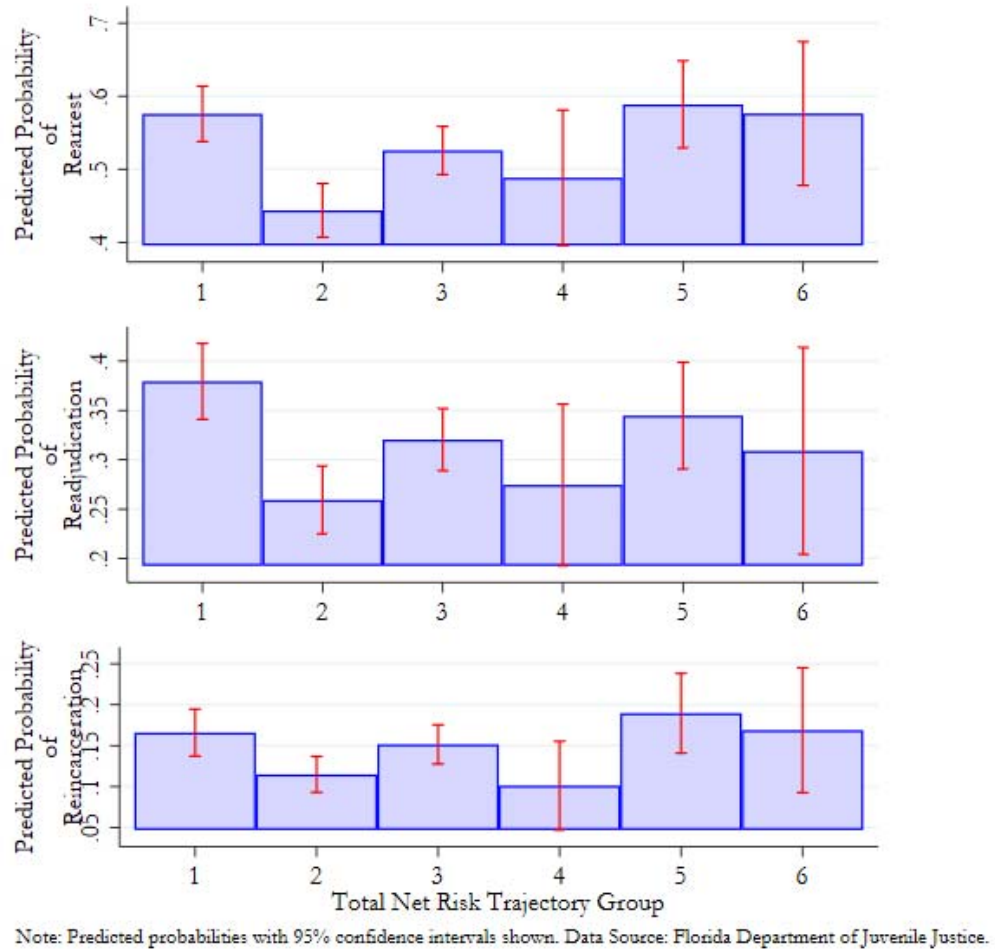
Constant	5.201***	44.728***	.658
	[2.092,12.931]	[16.768,119.313]	[.183,2.372]

Note: \* p < .05, \*\* p < .01, \*\*\* p < .001. Odds Ratios (OR) and 95% confidence intervals shown. Group 2 (Low-Risk & Stable) represents reference category.

The results presented in Table 7 suggest there are still significant and meaningful differences in recidivism among the different groups identified by the trajectory analysis. For example, youth in Group 1 (moderate risk with modest increases) were significantly more likely to be rearrested (OR = 1.70 CI = 1.35 - 2.14), readjudicated (OR = 1.75 CI = 1.35 - 2.26), and reincarcerated (OR = 1.53 CI = 1.12 - 2.09) than youth in the reference category (Group 2, low risk and stable). Similarly, Group 3 (moderate risk and stable) was substantially more likely than Group 2 to evidence continued delinquency, as was Group 5 (moderate-to-high risk and stable). Interestingly, the group of highest-risk youth (Group 6) only evidenced a greater likelihood of rearrest, but was not significantly different in terms of readjudication or reincarceration. Also important, Group 4, the only group to evident substantial change across assessment periods, did not recidivate at a significantly higher rate than the low risk and stable group although they began with much higher levels of initial dynamic risk.

Consistent with prior research on juvenile recidivism the results in Table 7 suggest that male and black youth were more likely than females to be rearrested, readjudicated and reincarcerated post-completion. Similarly, youth who were older at the time of completion were less likely to recidivate. While there were fewer consistent patterns between the criminal history variables explored and recidivism, both prior secure detention stays and a history of residential placement were associated with a higher likelihood of recidivism among this sample. Neither of the community-level factors were associated with the outcomes explored.

Although the youth among the full-screen sample evidenced substantially fewer changes in dynamic risk (as evidenced by fewer trajectories characterized by increases or decreases in total net risk) there is consistent evidence that the *level* of total dynamic risk is associated with the likelihood of juvenile recidivism. Further, there is some evidence that changes in dynamic risk are meaningful, as the trajectory groups which evidenced substantial declines in net risk over the analysis period did not have significantly different rates of recidivism as compared to the group of youth characterized by a much lower (and stable) level of dynamic risk. The predicted probability of each outcome explored across each of the trajectory groups is shown in Figure 5.



**Figure 5: Predicted probability of recidivism by trajectory group (full-screen sample).**

## **Assessing Change across Separate Domains of Dynamic Risk**

The final aim of the current study was to assess whether dynamic risk in separate life domains tends to follow similar trajectories over time, or whether unique combinations of dynamic risk trajectories across domains exist among youth. To do this, we used dual trajectory analysis to assess how changes in one life domain are related to changes in another domain. However, prior to the estimation of the dual trajectory models, a number of preliminary steps were undertaken in order to determine how interrelated net risk scores in various domains were to one another. First, we estimated a series of linear regression models to assess the association between the time varying measures of net risk in one domain to each of the other domains drawn from C-PACT assessment (results displayed in Appendix A). Consistent with the factor analyses described above, there is substantial evidence that levels of risk in one domain are positively and significantly associated with levels of risk in other domains. In fact, the only domain that was not significantly associated with more than one of the other domains examined was current mental health. Its distinctiveness lines up with the results of the factor analyses as well. Overall, the results obtained suggest that youth who have elevated levels or risk in one domain are likely to have elevated levels or risk in other domains, and that these domains are likely to track each other over time.

Secondly, in order to determine which domains are worthy of inclusion within a dual trajectory analysis we undertook a second preliminary step in which we explored whether changes in a given domain were significantly associated with our outcome measures, net of changes in other domains as well as demographic and criminal history control variables. Results suggest that changes in net risk across a small number of domains are related to the three measures of recidivism (see Appendix B). Specifically, domains 3 (current school status) and 7 (current living arrangements) were related to rearrest, while domain 10 (attitudes and behaviors) was related to reincarceration. Interestingly, Domain 11 (aggression) was associated with all three outcomes, but not in the



anticipated direction.<sup>3</sup> Among the domains which were significantly and positively associated with measures of reoffending, Domain 3 (current school status) and Domain 10 (current behaviors and attitudes) were selected for inclusion in the dual trajectory analysis given the degree of within-youth variability present. The hope here was that the within-individual variation would translate into trajectory groups with greater temporal variability (increases and decreases).

The first step of the dual trajectory analysis is to identify distinctive trajectories in each domain individually using the processes detailed in the methods section elucidated above. After establishing the number and shape of trajectories within each domain on their own, the dual trajectory model of current school status and attitudes and behaviors was estimated (Nagin and Tremblay, 2001). Key outputs from the final model estimated are the conditional and joint probabilities of trajectory membership across two domains in dynamic risk (current school status and attitudes/behaviors). Figures 6 and 7 display the resulting trajectories and respective proportion of youth identified in each of the domains analyzed.

Notably, seven trajectories of risk in the current school status domain were identified, ranging from a low of 5.6% of the youth in the high risk and decreasing group to 34.8% of the youth in the moderate risk and stable group. Additionally, the second least prevalent group was the moderate risk and decreasing, meaning both of the groups demonstrating change over time (both decreasing risk) were composed of the least number of youth. Similarly, the attitudes and behaviors domain evidenced six distinct trajectories, with the only group demonstrating change over time (the mod-high risk and decreasing group) being composed of the least number of youth (3.7%). The largest group was the low-mod risk and stable group at 36.8% of the youth.

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<sup>3</sup> Important to remember that among this sample, measures of net risk were highly correlated with one another which may have led to these somewhat puzzling results. Given the current study's goal to examine dual risk trajectories, however, it was important to establish which domains were related to recidivism net of the other domains considered.

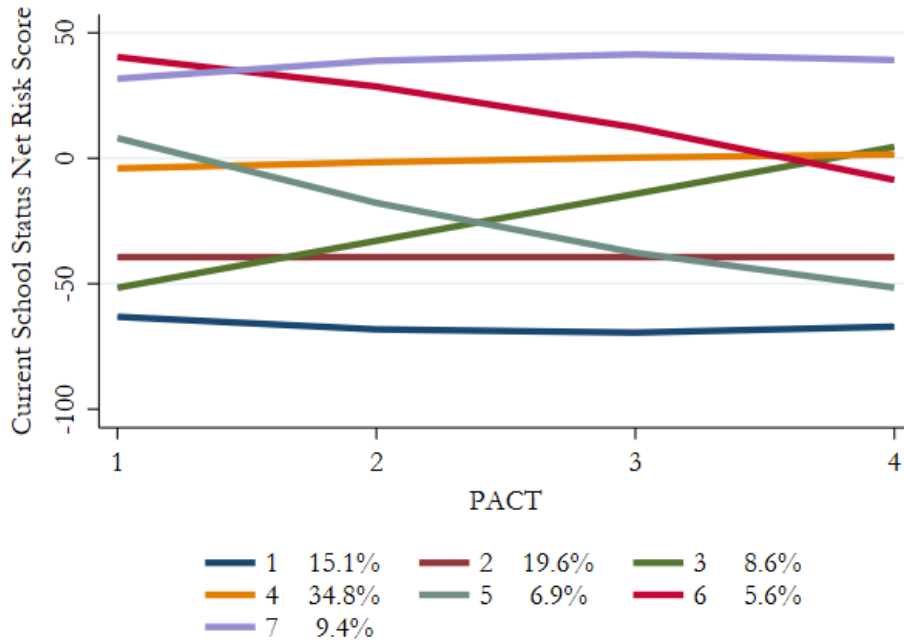


Figure 6: Trajectories in net risk within the current school status domain

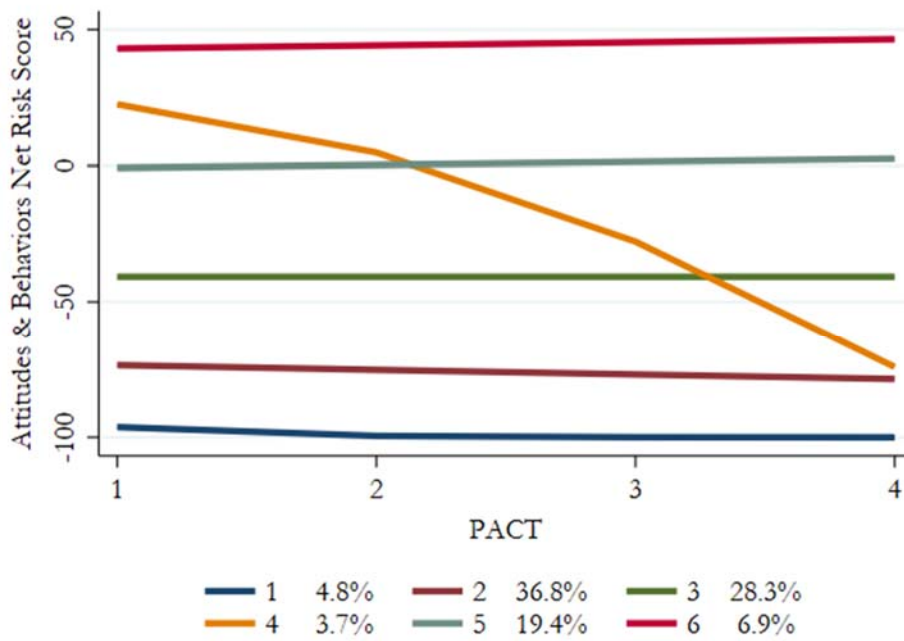


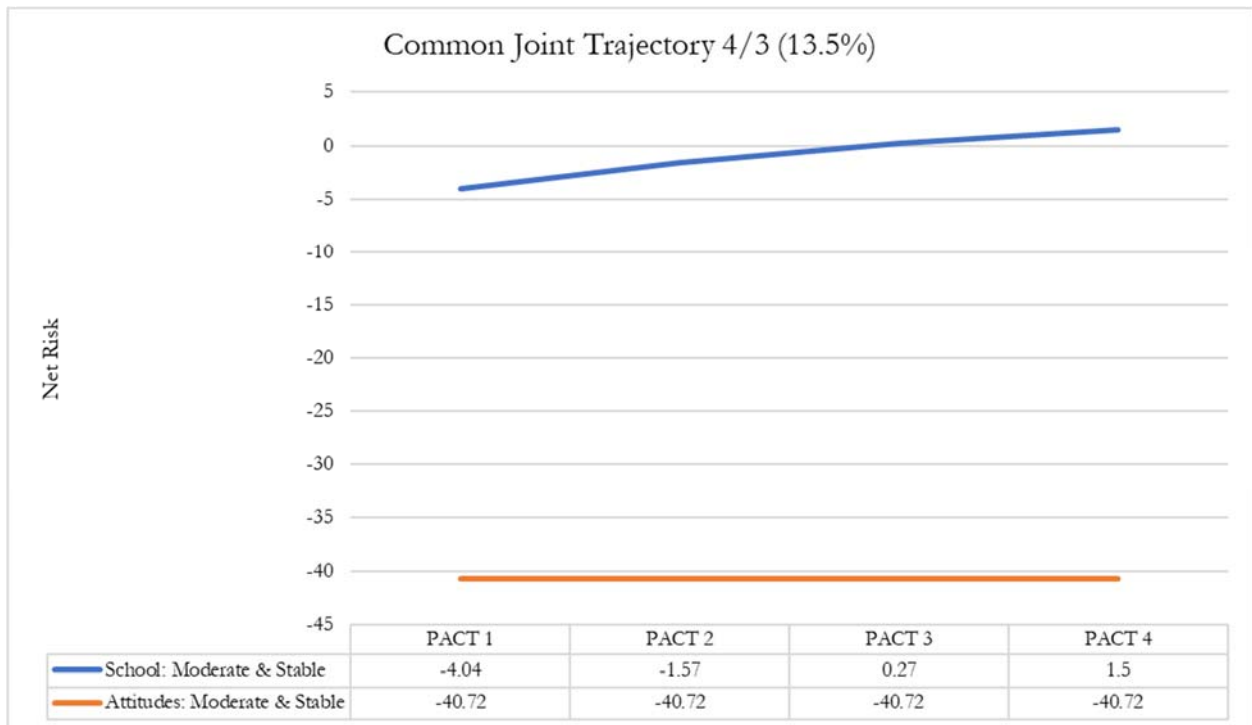
Figure 7: Trajectories in net risk within the attitudes and behaviors domain

Table 8: Interrelationship between Current School Status and Attitudes and Behaviors

Current School Status	Attitudes and Behaviors					
	Group 1: Low & Stable	Group 2: Low-Mod & Stable	Group 3: Moderate & Stable	Group 4: Mod-High & Decreasing	Group 5: Mod-High Stable	Group 6: High & Stable
Group 1: Low Risk & Stable	83 2.88%	272 9.45%	60 2.09%	9 0.31%	10 0.35%	0 0%
Group 2: Low-Mod Risk & Stable	30 1.04%	301 10.46%	207 7.19%	1 0.03%	37 1.29%	0 0%
Group 3: Low Risk & Increasing	9 0.31%	141 4.90%	64 2.22%	5 0.17%	17 0.59%	0 0%
Group 4: Moderate Risk & Stable	15 0.52%	259 9.00%	389 13.52%	15 0.52%	281 9.77%	68 2.36%
Group 5: Moderate Risk & Decreasing	4 0.14%	59 2.05%	42 1.46%	41 1.43%	33 1.15%	8 0.28%
Group 6: High Risk & Decreasing	0 0%	11 0.38%	15 0.52%	26 0.90%	60 2.09%	32 1.11%
Group 7: High Risk & Stable	0 0%	13 0.45%	39 1.36%	8 0.28%	118 4.10%	95 3.30%

To explore the dynamic association between current school status and attitudes and behaviors, Table 8 reports the frequency and joint probabilities of trajectory membership across the two domains of net risk. The sum of each of the 42 cells is equal to 100% of the cases analyzed. It is observed that the joint probability of belonging to any one cell is rather low and there are a number of empty cells (n=0), however there are a few patterns that are worth mentioning. In the current study we choose to focus our discussion of the results on 1) the most common joint trajectories, 2) the least common joint trajectories and 3) the most dynamic trajectories present across domains.

The first most common joint trajectory was those youth who fell into Group 4 on current school status and Group 3 of attitudes and behaviors. This corresponded with the trajectories characterized as moderate and stable within both domains and made up 13.5% of all youth (shown in Figure 8). The second most common joint trajectory (10.5%) was among youth who were low-to-moderate risk and stable in terms of current school status (Group 2) and were also classified as low-to-moderate and stable in terms of their attitudes and behaviors (Group 2; shown in Figure 9). Finally, as shown in Figure 10, an additional 9.8% of youth fell under the joint trajectory characterized by moderate and stable in terms of current school status (Group 4) and moderate-to-high and stable in terms of attitudes and behaviors (Group 5).



**Figure 8: Most common joint trajectory among school and attitudes domains**

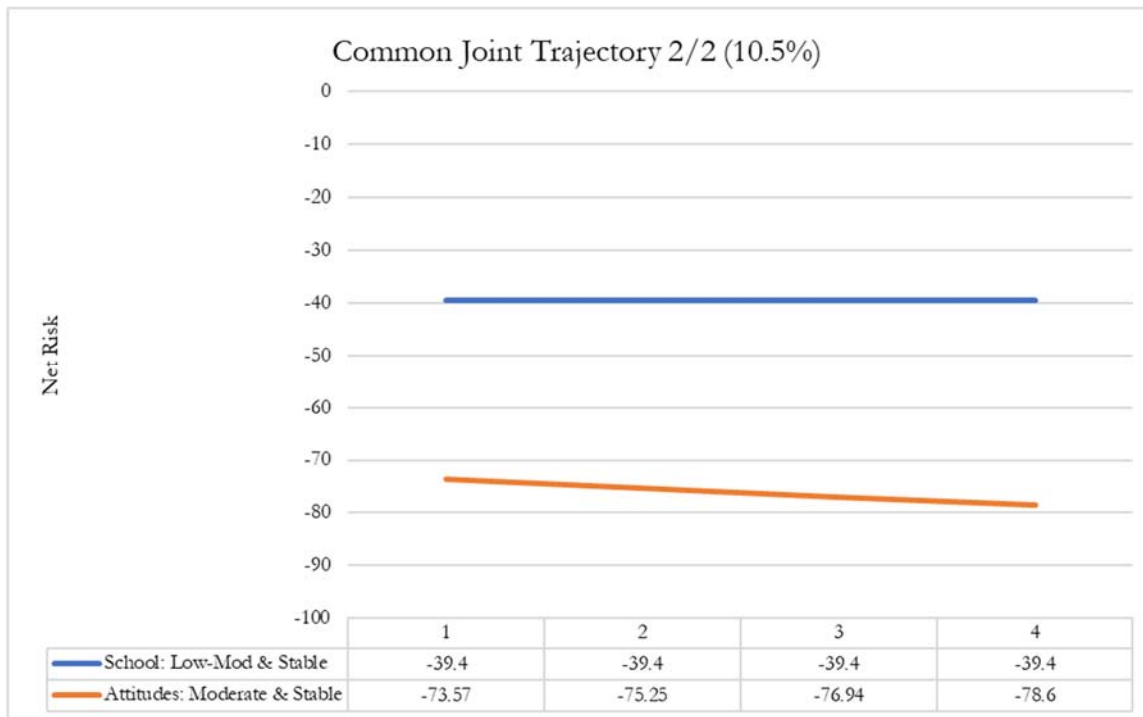


Figure 9: Second most common joint trajectory among school and attitudes domains

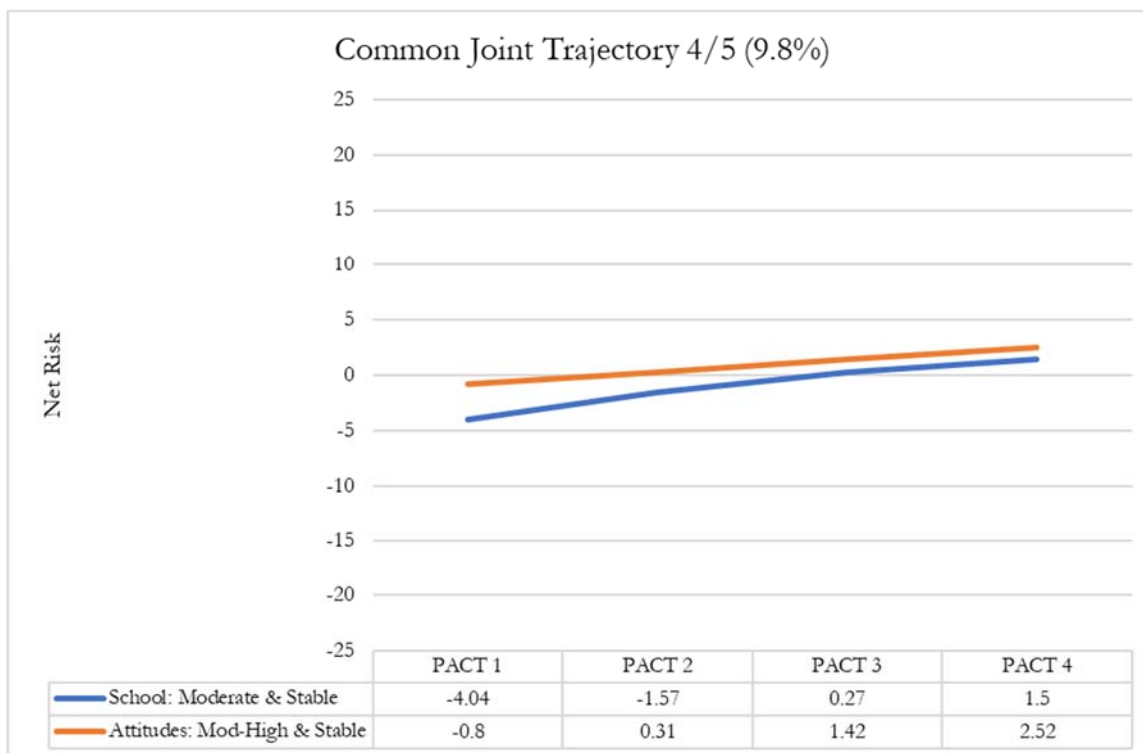


Figure 10: Third most common joint trajectory among school and attitudes domains

It is also important to highlight that there are a number of joint trajectories which do not exist in the data (empty cells), however this is not completely unexpected as it is unlikely that a given youth that is relatively high risk in one domain (i.e., school) is going to be relatively low risk in the other domain examined (i.e., attitudes and behaviors). In Table 8, these cells correspond to the bottom left and top right of the matrix, which is precisely where we see the zero counts as well as extremely small proportions. These results support the assertion that levels in dynamic risk in one domain are likely associated with similar levels of risk in other domains, and that youth experience complex patterns of needs to be addressed by system actors. This is in keeping with the notion that the youth most at-risk for (continued) delinquency are those who evidence risk across factors, rather than those high risk in a single area (risk factors operate in a cumulative fashion; e.g., Howell, 2009).

Finally, we found it pertinent to explore the associations present between the youth in the trajectory groups that evidenced some dynamic change within the current school status domain. This corresponded to groups 3, 5 and 6 and in combination this group makes up approximately 20% of the full sample ( $574/2877 = 19.95\%$ ). Table 9 displays the frequency and relative proportion of youth that correspond with the trajectory groups youth have fallen under in the attitudes and behaviors domain. As shown in Table 9, we found that the majority of youth who evidenced increases in net risk within the school domain belonged to the low-moderate risk and stable trajectory group within the attitudes/behaviors domain. Even then this group represents a very small proportion of the total sample ( $141/2877 = 4.9\%$ ). The youth in the trajectory group characterized by a moderate and decreasing level of risk within the current school domain, were more equally distributed among the trajectories in attitudes and behaviors with about one quarter of them falling in the trajectory categorized by moderate-to-high levels of risk and decreasing in the attitudes/behaviors domain. While important to identify youth that might be improving across both of these domains, the 47 youth that belong to this joint trajectory represent only 1.6% of the total

sample. Similarly, only 26 youth (<1% of all youth) evidenced declines from high levels of school risk and declines in net risk associated with attitudes and behaviors. These extremely small frequencies within the joint trajectories associated with changes in net risk make it impossible to identify the predictors of group membership with any real certainty. Further, given their small size, the resulting differences in recidivism across the groups do not approach the level of being statistically significant.

Table 9: Identifying Domain-Specific Trajectories among Most Dynamic Youth

	Attitudes and Behaviors Trajectory Group					
	Low & Stable	Low-Mod & Stable	Moderate & Stable	Mod-High & Decreasing	Mod-High & Stable	High & Stable
School Trajectory Group #3 Low & Increasing (8.6%)	9 3.81%	141 59.75%	66 27.12%	5 2.12%	17 7.20%	0 0%
School Trajectory Group #5 Moderate & Decreasing (6.8%)	4 2.14%	59 31.55%	42 22.46%	41 21.93%	33 17.65%	8 4.28%
School Trajectory Group #6 High & Decreasing (5.6%)	0 0%	13 8.84%	15 10.20%	26 17.69%	60 40.82%	33 22.45%

Overall, the results from this final portion of our analysis underscore some of the findings from those analyses presented prior. First, there is less evidence of change in dynamic risk among youth serving a term of community supervision than might originally have been expected. The results of the trajectory analyses overwhelmingly support the idea that youth are relatively stable in terms of dynamic risk. Although youth do vary in terms of levels of risk, only a small proportion of youth fall into the derived trajectories which evidence change across assessments during community supervision. This is especially true when using the domain net risk scores drawn from the 59 dynamic items contained in the full C-PACT. These findings, as well as others described above are discussed in detail within the following section of the report.



## Implications for Research and Policy & Practice

The overarching outcome of the current study was to expand the understanding of dynamic risk assessment in the prediction of juvenile recidivism, as well as highlight the importance of reassessing youth in terms of both their risk and protective factors during their community-based juvenile justice placements so that proper treatment modalities can be developed. The study built on previous research yet addressed several gaps in the emerging literature and knowledge base on dynamic risk assessment and the importance of community context. Further, no prior study had examined latent trajectories of change in risk and protective scores during community-based placements for juveniles (note: Kitzmiller, Paruk, & Cavanagh, 2022 employed growth models of overall risk scores and domain risk scores but did not assess whether different trajectories of risk are found across youth).

Results indicated youth who evidence higher levels of dynamic risk and/or increases in total dynamic risk over time are at the greatest risk of further delinquent behavior. Additionally, the current study demonstrated that youth can be classified into a number of meaningful groups, characterized by different pattern in total dynamic risk during their time in community-based juvenile justice placements. However, we also show that the majority of youth were classified into groups with very little evidence of change over time, and could only be differentiated by overall levels of dynamic risk (i.e., low- versus moderate- versus high-risk). Importantly, a number of smaller, more fluid groups were uncovered, and notably these groups exhibited meaningful differences in continued delinquency after accounting for a host of other demographic and criminal history risk factors.

Interestingly, for both the C-PACT prescreen and the full assessment samples, youth with greater levels of dynamic risk evidenced more prior placements in secure detention, while other

criminal justice placement and prior offending measures were indicative of less dynamic risk. This runs counter to our expectations, and indicates there is something unique about dynamic risk versus overall risk to reoffend (which is traditionally weighted heavily by criminal history indicators). Additionally, findings revealed more fluctuations in risk (groups where risk changed over time) for the prescreen sample in comparison to the full assessment sample. However, it must be recalled that the prescreen youth were assessed every 180 days, meaning their four assessments covered 18 months of time (0, 180, 360, 540 days), while the full assessment youth were assessed every 90 days, meaning their follow-up covered half the amount of time (0, 90, 180, 270 days). Perhaps the full assessment youth would have evidenced more change had they been tracked longer. Nevertheless, the extent of change, and the proportion of youth who evidenced change over time during community-based placements is substantively smaller than the proportion of youth who evidence change during the course of a residential placement (e.g., Baglivio & Jackowski, 2015; Baglivio, Wolff, Jackowski, & Greenwald, 2017; Baglivio, Wolff, Piquero, DeLisi, & Vaughn, 2018; Baglivio, Wolff, Piquero, Howell, & Greenwald, 2017). For instance, the largest group (33.2%) of youth completing residential placement assessed 4 times every 90 days were classified as “moderate initial risk moderate gains”, which equated to a higher protective relative to risk balance in that study (Baglivio, Wolff, Piquero, Howell, & Greenwald, 2017), compared to 5.1% of youth in the prescreen sample what improved over time.

The vast majority of youth assessed during community-based placements in the current study demonstrated stability in dynamic risk, regardless of their extent of initial dynamic risk (meaning little change in where a youth started relative to his/her peers; those high risk initially remained so, as did those who started out low risk or moderate risk). The contrast from the current study (little change over time) from the earlier work examining youth in residential placements may be due to youth receiving dispositions to residential programs have more dynamic risk to begin with

(more room for change), but differences in findings cannot be attributed to the inclusion of protective factors in the prior (residential) youth sample. The current study's full assessment sample, assessed every 90 days as the prior residential study was, also included protective factors in creating the "net risk" measure. Rather, our understanding is that residential programs provide more intensive treatment targeted to risk reduction and protective enhancement. For instance, residential programs are required by contract, and extensively monitored by the 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) 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).

Lipsey (2009) demonstrated, using a meta-analysis of over 500 high-quality studies, the recidivism reductions associated with treatment services are not trivial, such as the average 26% reduction in reoffending for those receiving cognitive behavioral treatment. Notably, Lipsey (2009) demonstrated that the type of service being provided was the strongest factor contributing to success, with cognitive behavioral, group counseling, behavioral, mentoring, and case management services all evidencing, on average, recidivism reduction 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). This is highly relevant to the current study as recidivism reductions stem from risk reduction and protective factor/strengths enhancement (Bonta & Andrews, 2016). The current study findings of only a small proportion of youth evidencing

dynamic risk reduction over time is likely a product of the types of services most youth under community-based placements actually received. Probation supervision is predominately focused on components of surveillance (curfew, urinalysis, school attendance, etc.), and deterrence (explicit or implicit threat of court sanctions and violation), services with, on average, either a null or iatrogenic effect on reoffending.

We do note, however, that some community-based dispositions do additionally include treatment components. As example, the FDJJ Redirections program provides a treatment overlay to probation supervision wherein participating youth and families are provided evidence-based family therapy (primarily Multisystemic Therapy, MST or Functional Family Therapy, FFT) in addition to traditional probation supervision. Both MST and FFT are buttressed by a relatively strong research base and extensive evaluation (e.g., Baglivio, Jackowski, Greenwald, & Wolff, 2014; Schaeffer & Borduin, 2005; Sexton & Turner, 2010). Additionally, FDJJ day treatment programs provide youth under community supervision with skill building and cognitive behavior interventions, such as Aggression Replacement Training (ART; Goldstein, Glick, & Gibbs, 1998). Furthermore, youth under probation supervision are referred for needed services, such as mental health and/or substance abuse treatment. Unfortunately, data are unavailable on which youth participated in which services nor the dosage of such interventions actually received for each youth. Nonetheless, the existence of treatment interventions, while not the norm for all youth with community-based dispositions, supports that current study findings that there is a proportion of youth that should be expected to evidence reductions in dynamic risk over time. This would be in keeping with prior work indicating stronger recidivism and risk reductions through interventions matched to assessed criminogenic needs among probationers (e.g., Luong & Wormith, 2011; Vieira, Skilling, & Peterson-Badali, 2009; Vitopoulos, Peterson-Badali, & Skilling, 2012).

Of note, for both the prescreen and the full assessment samples, findings indicated that youth belonging to trajectory groups that began as moderate-high risk at the start of their community-based placement were the only groups that evidenced risk reduction. Youth with the highest dynamic risk remained relatively stable, youth with moderate initial dynamic risk remained stable or increased, the lowest dynamic risk youth remained stable, while youth with initial moderate-high dynamic risk all evidenced decreasing dynamic risk over time, though to different degrees. Importantly, a moderate-high risk trajectory group of prescreen youth ended placement with the second to lowest dynamic risk of all groups (higher only than the group that began with the lowest dynamic risk). While the risk principle (Bonta & Andrews, 2016) would posit low-risk youth to not be in need of intensive services, findings related to higher risk groups begs the question as to what may be working with the moderate-high risk youth for them to be the only group demonstrating dynamic risk reduction over time. Interestingly, while not centered specifically on only dynamic risk, FDJJ practice holds that moderate-high and high-risk youth remaining in the community be recommended (to the court) for dispositions with more intensive service components (e.g., day treatment programs, intensive family therapy; Baglivio, Greenwald, & Russell, 2014). It stands to reason that service components that include evidence-based interventions and treatments would perform the best at decreasing dynamic risk.

Future work would provide great benefit and policy relevance in attempting to uncover which specific interventions, provided with fidelity at sufficient dosages, assist with reducing dynamic risk throughout community-based placements for higher risk youth and assessing the barriers to such youth in receiving those services. Available evidence certainly suggests the efficacy of such approaches (e.g., Baglivio, Wolff, Howell et al., 2018; Baglivio, Wolff, Jackowski et al., 2018; Lipsey, 2009). Potential barriers to actualizing this approach may be at the youth/family level (transportation issues, perhaps lack of funding or insurance if applicable), community level (lack of

treatment resources in the local community), or at the agency/court level (barriers to staff making appropriate referrals, court processes that may prohibit certain youth from specific service types).

Overall, findings demonstrate that, predominately, not much change in dynamic risk was evidenced among the samples of youth completing community-based dispositions. Importantly, with respect to policy, the only group among those receiving the C-PACT full assessment to evident substantial change across assessment periods, did not recidivate at a significantly higher rate than the low risk and stable group in spite of much higher levels of initial dynamic risk. This is similar to the findings for the prescreen mod-high and rapidly decreasing group who did not differ in rearrest, readjudication, or reincarceration from the low risk and stable group. This means practitioners examining reductions in dynamic risk over time as a gauge of improvement among youth serving juvenile justice community-based dispositions is a meaningful endeavor. Fortunately, the FDJJ centralized information system provides automated reports that graphically represent changes in risk and protective factors from initial to each reassessment. This automated procedure is likely to inform practitioners' approach to youth who evidence substantial changes during the course of community placement.

A further consideration stemming from the findings of predominately minimal dynamic risk change across most trajectory groups is the assessment software itself. The C-PACT in Florida was developed such that a given youth's prior C-PACT assessment response to each item is highlighted for the user during the current assessment interface. As such, practitioners completing the assessment see what was selected for each item in a prior assessment for that same youth. One could reason that staff would be hesitant to select a different response when presented with the prior response highlighted. In contrast, however, we could also reason that staff would want to show progress in their treatment of youth over time (e.g., that they are helping the youth improve across domains they have targeted in case plans) and that the highlighting of a prior response would push

them to selecting a different response at reassessment. The design was intended to assist with time management and concerns of the process of completing assessments not taking unneeded time away from working with youth when the C-PACT was implemented in Florida. Standardized assessment of risk and needs was a new endeavor at the FDJJ in 2006 when the C-PACT was implemented, and to minimize staff resistance considerations of user interface and efficiencies were a high priority. Future work could benefit from assessing whether practitioners are more/less likely to change responses from initial assessment when the prior response is readily visible when completing a reassessment.

With regard to the importance of indicators of community context, for the prescreen sample residing in areas with greater immigrant concentration was related to increased odds of rearrest (but not readjudication or reincarceration), while immigrant concentration was not related to any recidivism measures among full assessment sample. Social disorganization was unrelated to recidivism for either the prescreen or full assessment sample. Notably, a measure of the youth's own immigrant status was unavailable. Nonetheless, even though predominately unrelated to reoffending, context is not be meaningless to explore in future work. Findings demonstrated that social disorganization was related to the only group increasing net risk over time among the full assessment sample, and immigrant concentration related to the only rapidly declining net risk group in that full assessment sample. Interestingly, immigrant concentration was positively associated with being in any group, including those increasing and decreasing in risk over time, relative to the low risk and stable group among the prescreen sample. It is just that once risk changes and common risk factors are included as predictors of recidivism that community context does not add to prediction.

Importantly, and a need for future research, the current study brought the use of dual trajectory analysis to examining changes of dynamic risk. The dual trajectory analysis demonstrated that risk across domains tracks similarly- that the more risk in one domain, the more risk in another

is most common. Practitioners should take head, as this means prevention and intervention should be multimodal and focus on a variety of risk factors to optimize success (e.g., such as MST addressing school, family, and peer associations). Certainly, more work is needed in this area to further our understanding of the interrelatedness of dynamic risk domains. Examining dual trajectories will likely be most fruitful among samples who evidence a greater degree of change than those explored in the current study where stability was the predominate path.

## **Limitations**

The results of the current study should be reviewed in light of several limitations. Most notably, neither the prescreen nor full assessment sample were generalizable to all FDJJ youth who received community-based dispositions. This limitation is due to the current study needing four successive assessments to explore trajectories over time, which requires the youth to have served at least 18 months under a community-based disposition for the pre-screen sample and 9 months minimum for the full assessment sample. For context, the average length of placement for youth completing community-based sanctions in fiscal year 2017-2018 (the most recent year explored in the current study) was 107 days for diversion services, 372 days for probation supervision, 157 days for probation with enhancement overlay services, 172 days for day treatment, and 111 days for Redirection (intensive family therapy) services (FDJJ, 2019). Therefore, the prescreen sample employed in the current study (requiring 18 months) is substantially longer than the 372 days average for probation (and even longer than other service types). The full assessment sample was closer to averages for probation supervision, but still much longer than averages for other service types. Quite possibly, by nature of the four-assessment requirement, the current study may be selectively weighted towards youth who did not perform as well under their community-based disposition and



were, therefore, kept longer under supervision/service. Unfortunately, data regarding performance are not available to assess that possibility.

Additionally, the current study used the C-PACT scoring, and did not attempt to optimize scoring or change scoring in any way. The scoring of the C-PACT in Florida had not, for the time periods examined in the current study, been changed from the initial 2006 implementation. Quite possibly factor analysis may demonstrate more methodologically defensible groupings of the dynamic items into domains, where items may switch domains or domains would need to be added/subtracted. This would be especially relevant to the dual trajectory analysis; the other analyses relied on measures of total dynamic risk. However, the extent to which the scoring of certain dynamic risk items would change through attempts to optimize scoring then the results of the current study would likely change.

From a practical sense, it is also important to state the FDJJ has recently revamped its assessment strategies and is no longer using the C-PACT, which has been recently replaced by a new risk assessment called the Community Assessment Tool (CAT). While the CAT is believed to be equally predictive of juvenile recidivism, it includes substantively fewer items for consideration. Moving forward, The Department should reexamine their tool's ability to assess dynamic change in risk and/or needs and assess whether those changes add to our knowledge of factors related to continued delinquency among youth involved in the juvenile justice system.

## **Conclusion**

The current study examined the extent to which dynamic risk changed over time during community-based juvenile justice disposition placements. Predominately, youth's dynamic risk relative to their peers remained stable; those starting lower risk or starting higher risk stayed that way throughout. However, youth are indeed on distinct trajectories of dynamic risk, and a small

proportion of youth (under 15%) do evidence change over time in terms of either increasing or decreasing in risk during placement. Importantly, membership in the various trajectory groups is predicted by prominent demographic, criminal justice placement, and prior offending measures. Additionally, while limited, contextual measures of the neighborhood in which youth reside affect both dynamic risk trajectory group membership and, to a lesser extent, reoffending. That the higher risk trajectory groups that evidenced dynamic risk reductions over time reoffended at similar rates as the lowest risk group is critically important to research and practitioners. Measuring changes in dynamic risk by considering both risk and protective factors/strengths in tandem, remains an essential component to assessing treatment progress over time and is, perhaps, the quintessential goal of juvenile justice system service providers.

## **Data Set Generated**

Two data sets were generated for the current study:

1. De-identified file (n =2,877) of all youth who completed a Florida Department of Juvenile Justice (FDJJ) community-based disposition between July 1, 2015 and June 30, 2018 that were assessed with the Community Positive Achievement Change Tool (C-PACT) risk/needs full assessment four times (initial assessment plus three reassessments). The file includes dichotomous indicators for each of the measures of recidivism within one-year following completion of community supervision.
2. De-identified file (n = 7,117) of all youth who completed a Florida Department of Juvenile Justice (FDJJ) community-based disposition between July 1, 2015 and June 30, 2018 that were assessed with the Community Positive Achievement Change Tool (C-PACT) risk/needs prescreen four times (initial assessment plus three reassessments).

The file includes dichotomous indicators for each of the measures of recidivism within one-year following completion of community supervision.

### **Dissemination Activities**

Dissemination activities for the current study include: 1) final report submitted to the National Institute of Justice (NIJ), 2) presented findings at the American Society of Criminology (ASC) 2021 conference, the Western Society of Criminology 2021 conference, and the Academy of Criminal Justice Sciences (ACJS) 2022 conference, with a final conference presentation at the ASC 2022 conference in November, 2022, 3) a presentation of the findings to the Florida Department of Juvenile Justice (FDJJ), and 4) drafting and submission of peer-reviewed research paper for publication (planned for Spring 2023).

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## Appendix A

Appendix A: Assessing the linear association present between domains in domain-specific net dynamic risk.

	d3b_netrisk	d4b_netrisk	d6b_netrisk	d7b_netrisk	d8b_netrisk	d9_netrisk	d10_netrisk	d11_netrisk	d12_netrisk
	b / 95% CI	b / 95% CI	b / 95% CI	b / 95% CI	b / 95% CI	b / 95% CI	b / 95% CI	b / 95% CI	b / 95% CI
d3b_netrisk	--	.621***	.525***	.313***	.126***	.051***	.629***	.544***	.566***
	--	[.578,.664]	[.498,.552]	[.293,.332]	[.110,.142]	[.027,.076]	[.601,.658]	[.509,.580]	[.532,.600]
d4b_netrisk	.242***	--	.274***	.156***	.046***	.049***	.284***	.211***	.258***
	[.226,.258]	--	[.254,.294]	[.142,.171]	[.034,.057]	[.033,.064]	[.260,.308]	[.184,.238]	[.231,.286]
d6b_netrisk	.430***	.576***	--	.308***	.086***	.054***	.664***	.557***	.559***
	[.408,.453]	[.534,.619]	--	[.289,.327]	[.071,.102]	[.034,.075]	[.638,.690]	[.525,.590]	[.527,.592]
d7b_netrisk	.562***	.722***	.675***	--	.124***	.058**	.823***	.799***	.708***
	[.525,.600]	[.654,.790]	[.635,.716]	--	[.101,.147]	[.022,.093]	[.778,.868]	[.749,.849]	[.656,.760]
d8b_netrisk	.348***	.325***	.289***	.190***	--	.077***	.394***	.394***	.402***
	[.306,.389]	[.242,.407]	[.234,.344]	[.156,.225]	--	[.038,.117]	[.337,.452]	[.336,.452]	[.343,.462]
d9_netrisk	.086***	.210***	.111***	.054**	.047***	--	0.031	-0.05	0.023
	[.046,.127]	[.147,.273]	[.070,.152]	[.021,.087]	[.023,.071]	--	[-.022,.083]	[-.110,.010]	[-.037,.084]
d10_netrisk	.445***	.515***	.573***	.324***	.101***	0.013	--	.751***	.717***
	[.424,.466]	[.473,.557]	[.551,.595]	[.306,.341]	[.086,.117]	[-.009,.035]	--	[.727,.776]	[.690,.744]
d11_netrisk	.300***	.298***	.375***	.245***	.079***	-0.017	.586***	--	.511***
	[.280,.321]	[.260,.337]	[.352,.398]	[.229,.261]	[.066,.092]	[-.036,.003]	[.565,.607]	--	[.485,.538]
d12_netrisk	.340***	.398***	.409***	.236***	.088***	0.008	.608***	.556***	--
	[.319,.361]	[.357,.440]	[.385,.434]	[.219,.254]	[.074,.101]	[-.013,.030]	[.585,.632]	[.528,.585]	--

Note: Unstandardized coefficients and 95% confidence intervals shown. Each cell represents the results of single regression model where net risk in one domain is regressed on net risk in another domain. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

## Appendix B

Appendix B: Association between domain-specific changes in net risk and juvenile recidivism.

	Model 1 Rearrest OR/ 95% CI	Model 2 Readjudication OR/ 95% CI	Model 3 Reincarceration OR/ 95% CI
d3b_change	1.004** [1.002,1.007]	1.003* [1.000,1.006]	1.003 [.999,1.007]
d4b_change	1.000 [.999,1.002]	1.000 [.998,1.002]	1.000 [.997,1.002]
d6b_change	1.003* [1.000,1.006]	1.002 [.998,1.005]	1.004* [1.000,1.009]
d7b_change	1.007** [1.002,1.012]	1.004 [.999,1.009]	1.002 [.996,1.009]
d8b_change	1.002 [.998,1.006]	1.003 [.999,1.007]	1.000 [.995,1.005]
d9_change	1.000 [.996,1.004]	1.000 [.996,1.004]	1.001 [.996,1.006]
d10_change	1.003 [.999,1.007]	1.003 [.999,1.007]	1.006* [1.001,1.011]
d11_change	.996** [.993,.999]	.996** [.993,.999]	.996* [.992,.999]
d12_change	.999 [.996,1.003]	1.000 [.996,1.004]	1.001 [.997,1.006]
d3b_netrisk1	1.001 [.997,1.004]	1.000 [.997,1.004]	.998 [.994,1.003]
d4b_netrisk1	1.000 [.998,1.002]	1.000 [.999,1.002]	.999 [.997,1.002]
d6b_netrisk1	1.002 [.999,1.005]	1.001 [.998,1.005]	1.001 [.997,1.005]
d7b_netrisk1	1.002 [.999,1.006]	1.003 [.999,1.008]	1.002 [.997,1.008]
d8b_netrisk1	1.001 [.997,1.006]	1.000 [.996,1.005]	.999 [.994,1.005]
d9_netrisk1	.998 [.995,1.001]	.998 [.995,1.002]	.999 [.995,1.004]
d10_netrisk1	1.005** [1.002,1.009]	1.006** [1.002,1.009]	1.009*** [1.004,1.013]
d11_netrisk1	.999	.997*	.997

d12_netrisk1	[.996,1.001] .997*	[.994,1.000] .996**	[.994,1.000] .996
Male	[.994,1.000] 1.712***	[.993,.999] 1.561***	[.993,1.000] 2.739***
Black	[1.376,2.129] 1.577***	[1.225,1.989] 1.448***	[1.876,3.998] 1.531***
Hispanic	[1.318,1.889] 1.318*	[1.192,1.758] 1.158	[1.191,1.969] 1.283
Age at Release	[1.020,1.704] .803***	[.873,1.534] .675***	[.893,1.845] .801***
Age at First Offense	[.757,.851] 1.007	[.634,.719] 1.127*	[.743,.863] 1.051
Prior Felony Referrals	[.916,1.106] 1.191***	[1.015,1.251] 1.200***	[.919,1.201] 1.266***
Prior Against-Person Felony Referrals	[1.089,1.304] 1.004	[1.089,1.323] .974	[1.118,1.434] .890
Prior Sexual Felony Referrals	[.863,1.169] .708	[.831,1.142] .666	[.733,1.081] .790
Prior Secure Detention Stays	[.482,1.041] 1.171***	[.421,1.053] 1.173***	[.443,1.409] 1.250***
Prior Residential Placement	[1.082,1.266] 1.240**	[1.077,1.279] 1.026	[1.115,1.400] 1.051
Constant	[1.054,1.460] 8.572***	[.863,1.220] 83.385***	[.851,1.298] .861
	[3.243,22.656]	[29.842,232.992]	[.243,3.058]

Note: \* p < .05, \*\* p < .01, \*\*\* p < .001. Odds Ratios (OR) and 95% confidence intervals shown.