



## What Works for Whom?

### *Juvenile Court Assessment Tool and Program Eligibility*

Washington State was the first state to require juvenile courts to use evidence-based programs (EBPs) for court-involved youth. To determine the types of programming most appropriate for youth, juvenile courts simultaneously began using a risk and needs assessment to match youth to programs based on skills deficits.

In 2018, the juvenile courts began developing the newest iteration of a fourth-generation risk-needs-responsivity assessment—the Juvenile Court Assessment Tool (JCAT). Following completion of the JCAT in 2020, the 2021 Washington State Legislature directed the Washington State Institute for Public Policy (WSIPP) to review the JCAT to assess potential eligibility under the JCAT that would appropriately assign youth to programs that meet their needs.<sup>1</sup>

This report begins with a brief description of the use of risk assessments and EBPs in Washington State in [Section I](#). [Section II](#) provides a description of the JCAT and how it differs from previous juvenile court assessments. Using data from court-involved youth, [Section III](#) analyzes the effectiveness of EBPs for different types of youth. [Section IV](#) summarizes the main findings and [Section V](#) concludes and discusses the importance of future research to confirm the findings in this study and address the limitations of the current research.

#### Summary

In 2022, Washington State Juvenile Courts will transition to a new risk-needs-responsivity assessment, the Juvenile Court Assessment Tool (JCAT). Replacing the former PACT assessment, the JCAT will be used to facilitate case management for court-involved youth, including referrals to state-funded evidence-based programs (EBPs). As a part of this transition, the Washington State Legislature directed WSIPP to examine youths' responsivity to EBPs to assist in the development of new EBP eligibility criteria.

The current study uses administrative data from the juvenile courts to examine what characteristics of youth are associated with significant reductions in recidivism following referral to and participation in state funded EBPs. We examine recidivism outcomes for male and female youth who previously were eligible for and participated in the six state funded EBPs to assess what risk scores, needs scores, and specific youth characteristics correlated with reductions in recidivism following participation in an EBP intervention.

The findings indicate that some youth characteristics identified on the JCAT are associated with significant reductions in recidivism following EBP participation, but these factors vary across sex and type of EBP. While not prescribing new eligibility criteria, the findings will assist the juvenile courts as they develop and refine eligibility for state funded EBPs under the JCAT.

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<sup>1</sup> Engrossed Substitute Senate Bill 5092, Chapter 334, Laws of 2021.

## I. Washington State's Juvenile Court System

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Washington State operates 33 juvenile courts across 37 counties for youth who commit a criminal offense before age 18.<sup>2</sup> Youth who commit an offense may enter into a formal diversion agreement with the local court or move forward with standard court processing. Youth who are formally charged and who are found guilty receive a sentence based on Washington's Juvenile Offender Sentencing Grid.<sup>3</sup>

Most youth receive a sentence to local sanctions (90.5% in FY 2019; 88.2% in FY 2020).<sup>4</sup> Local sanctions may include any combination of confinement in county detention (30 days or less), community supervision, work crew, electronic home monitoring, or community service.<sup>5</sup>

Youth sentenced to community supervision are assigned to a Juvenile Probation Counselor (JPC) in the local juvenile probation department for case management which may include referrals to state-funded evidence-based programs.

### Evidence-Based Programming

Since the passage of the Community Juvenile Accountability Act (CJAA) in 1997, the legislature and juvenile courts have focused

on rehabilitating justice-involved youth through community-based programs.<sup>6</sup> To this end, the legislation invested in funding for evidence-based programs for youth on probation, the use of which continues today.

Under the CJAA, local courts receive funds through the Department of Children, Youth, and Families Juvenile Rehabilitation to support programs for youth on local supervision.<sup>7</sup> Decisions regarding the types of programs eligible for CJAA funds are made through joint committees composed of representatives from the Washington Association of Juvenile Court Administrators (WAJCA) and Juvenile Rehabilitation (JR).

CJAA funding for evidence-based programs (EBPs) is conditional on the development of a standardized risk assessment tool that classifies youth according to their risk of recidivism and determines eligibility for available EBPs.<sup>8</sup> Initially, WAJCA and WSIPP collaborated to develop a new assessment, originally named the Washington State Juvenile Court Assessment (WSJCA), implemented in 1999. In the early 2010s, the WSJCA underwent minor modifications and was renamed the Positive Achievement Change Tool (PACT).<sup>9</sup>

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<sup>2</sup> Knoth, L., Drake, E., Wanner, P., & Westley, E. (2020). *Washington State's juvenile justice system: Evolution of policies, populations, and practical research* (Doc. No. 20-01-1901). Olympia: Washington State Institute for Public Policy.

<sup>3</sup> RCW 13.40.0357.

<sup>4</sup> Luu, D. (2020). *Juvenile disposition summary: Fiscal year 2020*. Olympia: Caseload Forecast Council and Luu, D. (2019). *Juvenile disposition summary: Fiscal year 2019*. Olympia: Caseload Forecast Council.

<sup>5</sup> Class A felonies and violent Class B felonies carry a standard sentence of confinement at a Juvenile

Rehabilitation facility. All other offenses carry a standard sentence of local sanctions except for some class B and class C offenses if a youth has an extensive criminal history record.  
<sup>6</sup> RCW 13.40.500.

<sup>7</sup> Funds are distributed through block grants to the local courts.

<sup>8</sup> RCW 13.40.510.

<sup>9</sup> Throughout this report, we refer to the WSJCA and PACT collectively as the PACT. For more information about the differences between these two instruments, see [Appendix I](#).

Under the PACT, youth on probation completed an abridged pre-screen assessment that resulted in a low-, moderate-, or high-risk classification. Youth assessed as moderate- and high-risk were required to complete a 126-item full assessment, resulting in separate scores on 12 domains related to criminogenic needs.

Eligibility for EBPs was determined using the results of a full assessment. The eligibility criteria for each program focused largely on dynamic risk factors.<sup>10</sup> Dynamic risk factors are conditions in a youth's life that are associated with an increased risk of recidivism that can change over time. These dynamic risk factors were used to identify differential the need for types of treatment.

Ten years after the implementation of the PACT, WAJCA commissioned a team of researchers to revisit the assessment and identify improvements. This research was motivated by the view that an update to the risk assessment instrument may increase the accuracy of the tool's predictions.<sup>11</sup>

The juvenile courts also hoped to look beyond just static and dynamic risk characteristics. Building on advancements in the development of risk tools,<sup>12</sup> a team of researchers completed the development of a new risk-need-responsivity (RNR) instrument named the Juvenile Court Assessment Tool (JCAT) in 2020.<sup>13</sup>

[Exhibit 1](#) provides a comparison of the basic characteristics and structure of the PACT and JCAT. Although the JCAT retained most of the questions and response options that were included in the PACT, items were removed if the updated research found the factors were not predictive of recidivism. The remaining items were re-weighted to maximize the predictive validity of the JCAT.

### [Factor Scores and Risk Level Classifications](#)

Under the PACT, youth were assigned a risk level classification of low-, moderate-, or high-risk based on the pre-screen instrument. Moderate- and high-risk youth were then administered the full version of the assessment.

The PACT assessment classified factor responses into four categories: static risk, static protective, dynamic risk, and dynamic protective. Youth received a total score for each of the four types of factors in each domain.

On the JCAT, low-risk youth are identified on a shortened pre-screen instrument. Moderate- and high-risk classifications are based on the full assessment instrument for youth who are not low-risk on the pre-screen. In addition to the general recidivism classifications, a second version of the JCAT classifies youth based on their likelihood to commit *violent* recidivism specifically. This report will focus solely on the risk level classifications for general recidivism.<sup>14</sup>

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<sup>10</sup> Dynamic risk factors are those characteristics that may change over time. For example, substance use or problem-solving skills. The other type of factors is referred to as static risk factors and either stay the same or change only in one direction. Static risk factors include characteristics like age and criminal history.

<sup>11</sup> Hamilton, Z., Kigerl, A., Mei, X., Routh, D., & Kowalski, M. (2020). *PACT validation and weighting results. Technical report. Deliverable 1: Updated PACT risk and needs assessment.* Pullman; Washington State University.

<sup>12</sup> Bonta, J., & Andrews, D.A. (2007). Risk-need-responsivity model for offender assessment and rehabilitation. *Rehabilitation, 6*(1), 1-22.

<sup>13</sup> The new assessment was originally named the MPACT—the Modified Positive Achievement Change Tool.

<sup>14</sup> The CJAA oversight committee has not decided how or whether the separate violent recidivism version of the JCAT will be used in juvenile courts. As such, they asked WSIPP to focus on the general recidivism classifications for analyzing program eligibility.

### Exhibit 1

#### Comparing the Basic Characteristics of the PACT and the JCAT

Characteristic	WSJCA / PACT	M-PACT / JCAT
Dates administered	1999 – present	TBD
Domains	<ul style="list-style-type: none"> <li>– Record of referrals</li> <li>– Gender</li> <li>– School</li> <li>– Use of free time</li> <li>– Employment</li> <li>– Relationships</li> <li>– Living arrangements</li> <li>– Alcohol and drug use</li> <li>– Mental health</li> <li>– Attitudes/behaviors</li> <li>– Aggression</li> <li>– Skills</li> </ul>	<ul style="list-style-type: none"> <li>– Criminal history</li> <li>– School</li> <li>– Associations</li> <li>– Family</li> <li>– Alcohol and drugs</li> <li>– Mental health</li> <li>– Attitudes/behavior</li> <li>– Aggression</li> <li>– Skills</li> </ul>
Outcomes predicted	General recidivism	General recidivism Violent recidivism
Risk level classifications (RLC)	Low Moderate High	Low Moderate High
Needs level classifications (NLC)*	–	Low Moderate High
Scores	Risk score	Risk score Needs score
Item weighting	Gender-neutral	Gender-specific

**Note:**

\*In the JCAT, Needs Level Classifications (NLCs) were created for school, associations, family, alcohol & drug, mental health, attitudes, aggression, and skills, with further divisions by recidivism type and sex, yielding 32 NLCs.

Rather than separate scores for static/dynamic risk and protective factors, the JCAT scores all responses with some receiving a negative score (protective) and others receiving a positive score (risk). When adding together the scores from individual factors, responses associated with protective factors reduce a youth's score while risk factors increase a youth's score. [Exhibit 2](#) compares the scores for the school history domain on the PACT and the JCAT's general recidivism and violent recidivism scales.

In addition to a youth's two overall risk scales, each dynamic factor is included in a separate needs assessment. Similar to the risk scales, protective factors receive a negative score and non-protective factors receive a positive score. The factor scores are summed to create a needs level classification (NLC) for every domain except for criminal history which has no dynamic factors.<sup>15</sup> Youth are classified as low-, moderate-, or high-need in each domain.

While the PACT used a single scoring method for all youth, the JCAT has different scoring methods for male youth and female youth. Factors are weighted differently for male and female youth and the thresholds for risk level classifications (RLCs) and NLCs are sex-specific.

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<sup>15</sup> All of the factors on the criminal history domain are considered to be static (e.g., they cannot change or change only in one direction) and are factors not directly targeted by EBPs. Rather, the theory of RNR suggests that successful

targeting of dynamic needs may reduce recidivism, thereby preventing an increase in scores on the criminal history domain.

## Exhibit 2

Comparing the Basic Characteristics of the PACT and the JCAT

School domain, part A		PACT scoring				JCAT scoring			
Question	Responses	Static risk	Static protective	Dynamic risk	Dynamic protective	Male youth Recidivism type		Female youth Recidivism type	
						Any	Violent	Any	Violent
<b>1. Minor is a special education student or has a formal diagnosis of a special education need. Maximum of 1 point</b>	No special education need		1			Not on School Domain Part A			
	Behavioral	1							
	ADHD/ADD	1							
	Learning	1							
	Mental retardation	1							
	Has an active IEP	1							
	Date of last IEP____	1							
<b>2. History of expulsions and out of school suspensions since the first grade.</b>	No expel/suspend		1			-1	-1	-1	-1
	1 expel/suspend	1				1	1	1	1
	2 or 3	2				2	2	2	2
	4 or 5	2				2	2	2	2
	6 or 7	2				2	2	2	2
	More than 7	2				2	2	2	2
<b>3. Age at first expulsion or suspension.</b>	No expel/suspension		1			-1	-1	-1	-1
	5 to 9 years old	2				2	2	2	2
	10 to 13 years old	2				2	2	2	2
	14 to 15 years old	1				1	1	1	1
	16 to 18 years old	1				1	1	1	1
<b>4. Minor has been enrolled in school during the last 6 months, regardless of attendance.</b>	No, graduated/GED and not attending school, <b>do not complete Part B</b>				2	-21	-8	-18	-10
	No, dropped-out or expelled for more than six months, <b>do not complete Part B</b>			2		34	19	26	23
	Yes, enrolled full-time must <b>complete Part B</b>				2	-4	-2	-2	-4
	Yes, enrolled part time, must <b>complete Part B</b>					-2	-1	-1	-2
	Yes, but suspended, dropped out, or expelled less than 6 months ago. Must <b>complete Part B</b>					6	3	3	6

## II. EBP Eligibility

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The CJAA Oversight Committee approved six EBPs for state funding. One program—Coordination of Services (COS)—may be used for youth assessed as low-risk. The remaining five EBPs are used for youth assessed as moderate- or high-risk and who meet additional eligibility criteria. [Exhibit 3](#) shows the eligibility criteria for the different CJAA-funded EBPs under the PACT.<sup>16</sup>

Following a conviction for a criminal offense, youth are assigned to a Juvenile Probation Counselor (JPC) who oversees the youth's case management. JPCs use the risk assessment, EBP eligibility criteria, and their own discretion to determine whether a youth should be referred to a state-funded EBP, a locally funded program, other forms of treatment such as drug/alcohol or mental health treatment, or supervision without any specific treatment program. JPCs may also consider the program's availability within the county, the youth's participation in other activities (such as school activities or sports), the youth's ability to attend the program (e.g., access to transportation), the youth's need for specialized substance use disorder or mental health treatment, and consent of the youth's parents or guardians, among other factors.

When youth are eligible for multiple EBPs, JPCs make referrals using the aforementioned information and their discretionary judgment about what program is most likely to help a particular youth or what order of program participation may be most effective.

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<sup>16</sup> Slight changes were made to the eligibility criteria when the PACT was introduced due to minor differences between the WSJCA and PACT, but the eligibility generally captured the same types of youth. Two programs (Education and Employment Training (EET) and Family Integrated Transitions

### [Determining Eligibility Under the JCAT](#)

Prior to implementing the JCAT, the CJAA Oversight Committee must establish new eligibility criteria for EBPs based on the domains, factors, and scores on the new assessment. Rather than making ad-hoc decisions about eligibility, the 2021 Legislature directed the CJAA committees to contract with WSIPP for the current study to examine the possibility of establishing empirically based eligibility criteria for the JCAT.

The findings from the current study will inform the development of new eligibility criteria by the CJAA oversight committee for use when the JCAT is implemented statewide. These updates are necessary to account for the changes in structure implemented by the new JCAT and to account for changes in the characteristics of court-involved youth over time. As populations and the RNR structure have changed the original eligibility criteria may no longer identify youth who are most likely to benefit from participation in different EBPs.<sup>17</sup>

In addition to the overall RLC, domain scores, and individual item responses, eligibility on the JCAT may also be expanded to include consideration of NLCs. Because items are scored differently for NLCs and RLCs, domain-specific NLCs may be a better identifier of eligibility than the total domain scores from the risk scales.

(FIT)) were used under only the PACT system. See [Appendix I](#) for a more detailed discussion of the differences between the WSJCA, PACT, and JCAT.

<sup>17</sup> [Knoth et al. \(2020\)](#).

### Exhibit 3

#### Washington State Juvenile Court Eligibility for Moderate- and High-Risk EBPs Under the PACT

Domain	Scores
Aggression Replacement Training (ART)	
<b>Risk level</b>	Moderate or high risk
<b>At least one of the Following:</b>	
Domain 1, criminal history	Static risk factor score of at least one for a weapon (item 4), violent misdemeanor (item 5), or felony conviction (item 6)
Domain 11, aggression	Items 2, 3, and 4 – dynamic risk factor of at least 2
Domain 10, attitudes/behavior	Items 6-10 – dynamic risk score of at least 5
Domain 12, skills	All items except 2 – dynamic risk score of at least 4
Functional Family Therapy (FFT)	
<b>Risk level</b>	Moderate or high risk
<b>Domain 7b, current living</b>	Dynamic risk score equal to or greater than 6
Multi-Systemic Therapy (MST)	
<b>Risk level</b>	High risk
<b>Domain 7b, current living</b>	Dynamic risk score equal to or greater than 8
Education and Employment Training (EET)	
<b>Risk level</b>	Moderate or high risk
<b>Age</b>	15 to 18
<b>At least one of the following:</b>	
Domain 3A, school history	Static risk score of 4 or 5
Domain 3B, current school status	Dynamic risk score between 7 and 22
Domain 5A, employment history	Static protective score is 0 or 1
Domain 5B, current employment	Dynamic protective score is 0-2
Family Integrated Transitions (FIT)	
<b>Risk level</b>	Moderate or high risk
<b>At least one of the following:</b>	
Domain 9A, mental health history	History of suicidal ideation (item 1)
Domain 9A, mental health history	History of mental health problems (item 7)
Domain 9A, mental health history	Current mental health problem status (item 14)
Domain 9B, current mental health	Current suicidal ideation (item 1)
Domain 9B, current mental health	Mental health treatment prescribed (item 3)
Domain 9B, current mental health	Mental health medication prescribed (item 4)
Domain 9B, current mental health	Mental health problems interfere with treating the youth (item 5)
<b>At least one of the following:</b>	
Domain 8A, alcohol and drugs	Any past alcohol use (item 1)
Domain 8A, alcohol and drugs	Any past drug use (item 2)
Domain 8A, alcohol and drugs	Current alcohol and/or drug use (item 6)

## Needs and Responsivity

Risk-needs-responsivity (RNR) assessments like the JCAT are rooted in three core principles: the risk principle, the need principle, and the responsivity principle.<sup>18</sup> Each of these components relates to treatment in different ways.

First, the risk principle suggests that those who are at the highest risk of recidivism should be prioritized for treatment services. In Washington State juvenile courts, EBPs are largely reserved for youth who score moderate- or high-risk. Only one program (Coordination of Services) is used for low-risk youth.

Second, the needs principle suggests that RNR assessments should identify criminogenic needs, and that treatment programs should target those needs. Deficits in certain domains (e.g., education, problem-solving skills) may make individuals more likely to recidivate. Identification of these deficits can better isolate what types of treatment a youth needs.

Finally, the responsivity principle suggests that youth may be more or less responsive to particular types of treatment. Services should be provided in a way that recognizes differences in learning styles, motivation, abilities, and skills. Certain youth characteristics may act as a barrier to effective engagement with rehabilitative services. Even the most effective programs may not exhibit a beneficial effect for some youth if there are characteristics that prevent them from appropriately engaging with treatment.

Individual characteristics captured by an assessment may operate as risk factors, needs characteristics, and/or responsivity barriers. For example, youth with low educational attainment may be more likely to commit a crime (higher risk). At the same time, low educational attainment may be a need that should be targeted with treatment. Finally, low educational attainment may serve as a barrier to responsivity for programs that require a certain level of knowledge or reading/writing skills. Other characteristics may fit only into one category of risks, needs, or responsivity. For example, youth with longer criminal histories may be at a higher risk of reoffending, but criminal history is not a need that can be treated and would not itself be a barrier to responsivity for most forms of treatment.

Often, RNR instruments use the same or similar factors in risk scales and needs scales, but those factors are scored differently between risk and needs scales. Responsivity is more likely to focus on individual characteristics as they relate to particular forms of programming (i.e., characteristics may be a responsivity barrier for some forms of treatment but not for other forms of treatment).

Eligibility for EBPs may be informed by a youth's risk, needs, and/or responsivity barriers. For example, a program may be effective for high-risk youth, but only if they have deficits in problem-solving skills or if they do not have a pre-existing diagnosed learning disability.

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<sup>18</sup> Bonta & Andrews (2007).

Understanding different aspects of eligibility may also help identify modifications to programs that could make them more accessible to or effective for alternative youth populations. For example, under the scenario above, the program may be adapted to account for learning disabilities in a way that reduces the barriers to responsivity for some youth.

Eligibility for EBPs under the PACT focused largely on risk, with less regard to needs or responsivity. For example, youth with the highest scores (i.e., highest risk) on the family domain were designated as eligible for Functional Family Therapy (FFT), presumably because FFT focuses on treating disorders within the family. However, it is possible that some youth have characteristics that may serve as a barrier to effective treatment, resulting in FFT participation that was unable to treat underlying risks in the family domain. It is also possible that the youth's risk scores on the family domain were driven largely by historic measures and not current family needs and a more refined needs assessment may show a lower need for family treatment programs. The current study seeks to expand the prior approach to eligibility to include all three principles of RNR assessments.

## Measuring Effectiveness

Historically, research analyzing effective criminal justice interventions has focused on whether participants in the program are significantly less likely to recidivate than similar individuals who did not participate in the program. This approach assumes that the measure of success is whether the individual engages in any type of future offending behaviors.

More recently, perspectives have shifted to examining desistance as a process rather than a singular event.<sup>19</sup> Many individuals who engage in repeat offending behaviors do not abruptly stop committing crime. Rather, desistance occurs over a period of time in which individuals engage in less severe forms of offending (de-escalation) and do so less frequently (deceleration) until they reach a more permanent state of non-delinquent behaviors (reaching a ceiling).<sup>20</sup>

For the current study, our measure of effectiveness focuses on recidivism defined as a conviction for a new criminal offense. In addition to examining programmatic effects on overall recidivism, we also examine whether the program reduces the likelihood of felony recidivism compared to misdemeanor recidivism. While we cannot include a direct measure of de-escalation,<sup>21</sup> if program participation reduces the likelihood of committing a subsequent felony offense, this may be an indication that the program does help facilitate the desistance process for court-involved youth.

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<sup>19</sup> Rocque, M. (2021). But what does it mean? Defining, measuring, and analyzing desistance from crime in criminal justice. In A.L. Solomon and J.S. Scherer (Eds.), *Desistance from crime: Implications for research, policy, and practice* (pp.1-39). Washington D.C.: National Institute of Justice.

<sup>20</sup> Bucklen, K.B. (2021). Desistance-focused criminal justice practice. In A.L. Solomon and J.S. Scherer (Eds.), *Desistance from crime: Implications for research, policy, and practice* (pp.111-134). Washington D.C.: National Institute of Justice.

<sup>21</sup> We were unable to accurately link assessment records to the associated court case records in the criminal history data. As a result, we could not account for the severity of the youth's current offense to test whether severity decreased with recidivism. Our analysis is designed to examine whether youth who participated in treatment were likely to commit a subsequent offense that was less serious than they would have in the absence of treatment.

### III. Data and Methods

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This section briefly describes the data and methods used for the current study. More detailed information is available in [Appendices I, II, and III](#).

#### Data

The primary data for this study come from the Juvenile Court Assessment Research Database (ARD)—the centralized database used by JPCs to complete the risk assessment for court-involved youth.

We constructed hypothetical JCAT scores for court-involved youth between 2011 and 2016. First, we matched each question and response option in the ARD and the JCAT. Second, we calculated each response score separately for female and male youth, for general recidivism risk, and criminogenic needs. Third, we calculated each youth's overall risk level classification (RLC) and their needs level classification (NLC) for each of the eight domains that include dynamic factors.

Differences in the response options and general assessment structure precluded us from constructing JCAT scores with 100% accuracy. However, the potential differences between our constructed hypothetical scores and a youth's true JCAT score are likely to be minor and unlikely to cause significant changes in the youth's final RLC and NLCs.<sup>22</sup> We have noted any limitations at the item response level throughout the analysis and findings sections of this report.

Finally, we connected the ARD data to WSIPP's Criminal History Database (CHD) to identify recidivism outcomes. The CHD includes conviction records from juvenile and adult courts, provided by the Administrative Office of the Courts (AOC). For more information on the data for this report, see [Appendix I](#).

#### Sample

The ARD includes juvenile assessment data from 2004 to 2022. The JCAT items and responses most closely resemble the items and responses on the PACT. In addition, research suggests that the characteristics of the court-involved youth populations may have changed over time.<sup>23</sup> To complete analyses that are both 1) most likely to reflect the hypothetical reality under the JCAT system and 2) most likely representative of current court-involved youth populations, we limit the main analyses in this report to youth assessed under the PACT between 2011 and 2016.

During the time frame for our sample, there were no consistent requirements on when or whether a youth must receive a reassessment. JPCs were required to complete a final assessment for each youth prior to or upon discharge from community supervision, but these final assessments would not be involved in treatment referrals. To avoid introducing bias by including some youth who had multiple reassessments and other youth who never had a reassessment, we restrict the sample to the initial assessment and the program eligibility and referral associated with that initial full assessment.

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<sup>22</sup> See [Appendix I](#).

<sup>23</sup> [Knoth et al. 2020](#).

## Exhibit 4

### Sample Size by Program

	Female youth		Male youth		
Program	Eligible, did not participate (control)	Eligible, started the program (treatment)	Eligible, did not participate (control)	Eligible, started the program (treatment)	Total
ART	3,040	1,362	9,224	4,160	17,786
COS	3,940	687	8,836	1,507	14,970
EET	5,279	91	15,536	305	21,211
FFT	3,735	832	10,489	1,954	17,010
FIT	4,734	21	8,870	60	13,685
MST	2,862	35	7,911	139	10,947
Total	23,590	3,028	60,866	8,125	95,609

Notes:

This table includes all eligible assessments.

Youth may have multiple assessments in our sample for which they were eligible for a given program. During our analysis, we use sampling techniques to ensure each youth is included only once on our sample. See [Appendix II](#) for more information.

Importantly, youth in our sample were only referred to EBPs if they met the current PACT eligibility criteria. This means that we are unable to test whether the current criteria inappropriately exclude some individuals for whom treatment would be successful. The results should be interpreted as differences in program effectiveness among those who meet the current (PACT) eligibility requirements.

[Exhibit 4](#) presents the total number of assessments in our sample that were eligible for each of the CJAA-funded EBPs. The table includes youth who were eligible and who started the program (our treatment sample) and those who were eligible but who did not start the program (our control sample).

### Outcomes

The primary outcome of this report is recidivism, defined as the conviction for a new offense. Consistent with WSIPP's recommendations for measuring recidivism with court-involved youth, we use an 18-month follow-up period and a 12-month adjudication period. We count court cases as recidivism if the offense occurred within 18 months from the beginning of the follow-up period and if the associated court case resulted in a conviction within 30 months from the beginning of the follow-up period.

It is also possible that programs may not have an overall effect in reducing recidivism but may reduce the seriousness of subsequent offending behaviors (de-escalation). We examined whether, among those who recidivated, youth who participated in a program were less likely than youth who did not participate in the program to recidivate with a felony or violent felony compared to a misdemeanor. While this is not a perfect measure of de-escalation, it does provide initial evidence of a potential desistance effect.

### Follow-up Periods

Youth on local supervision may not immediately receive a referral to an EBP and those who do receive a referral may not immediately begin participating in the EBP. Because our research is focused on whether participation in a particular program reduced a youth's likelihood to recidivate, we start the follow-up period for youth who participated in an EBP on the start date of the EBP as listed in the ARD data.

For youth in the comparison group, we created a hypothetical date on which they would have started treatment if they did receive a referral to a particular EBP.<sup>24</sup>

We use an 18-month follow-up period with a 12-month adjudication lag. That is, we count offenses as recidivism if they occur within 18 months of the at-risk date and result in a conviction within 12 months after the end of the follow-up period.

## Method

To inform program eligibility requirements, this study is designed to determine whether youth with particular characteristics (e.g., RLC, NLC, domain scores, or individual factor responses) were more likely to benefit from participation in different EBPs. To do this, we examine how the effect of these programs differ across various subsamples of youth with different characteristics

We compare recidivism outcomes of individuals who started an EBP (the treatment group) to those who were eligible to start an EBP but did not start for various reasons (the control group). Eligible youth may not have participated for a variety of reasons, including that they may have been participating in a different treatment program or that they were simply unable to attend.<sup>25</sup>

We use a statistical method called "entropy balancing" which ensures that our control group and treatment group are similar to each other in measurable characteristics, (e.g., age, criminal history). This is important as it increases the chance that our results reflect the effects of treatment and not other systematic differences between youth in the treatment group and youth in the comparison group. However, there is still the chance that the groups are different from each other in unmeasured ways.

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<sup>24</sup> For more information, see [Appendix I](#).

<sup>25</sup> See [Appendix II](#) for a further discussion of the reasons individuals were eligible but did not start. We attempted a robustness check limiting the control group to reasons that

were outside of an individual's control, but the sample size was too small and models were unable to be estimated in a large proportion of cases.

## Exhibit 5

### Subgroups Included in Eligibility Analyses

Model category	Eligibility restrictions	Number of subgroups
Baseline	None	1
RLC (any recidivism)	Youth categorized as moderate- or high-risk on general recidivism scale	2
NLC (domains)	Youth categorized as moderate- or high-need on each of eight domains' general recidivism need scales	16
Domain risk score quartiles	Youth who scored in each quartile of the total risk points on each of nine general recidivism risk scale domains	36
Domain need score quartiles	Youth who scored in each quartile of the total needs points on each of the eight general recidivism needs scale domains	32
RLC-NLC interactions	Moderate- and high- risk by moderate- and high-need on domains 2-9	32
Factor responses	Youth who responded affirmatively on specific factor responses*	252
Total		371

**Notes:**

\*We combined responses on many factors, reducing the total number of responses from 352 to 252. For example, on Domain 2b, the first factor is "Youth is a special education student or has a formal diagnosis of a special education need:" The four possible responses are: No special education, Behavior, ADHD, and Learning. For our analysis, we collapsed Behavior, ADHD, and Learning to create two groups (no special education need and any special education need) rather than four separate groups.

For each program, we conduct the following steps. First, we create subsamples of youth by selecting all youth with a particular characteristic (e.g., youth with a high-risk RLC or youth who responded in a particular way for a specific factor). Second, we use entropy balancing to ensure that youth in the comparison group are the same as youth in the treatment group on other demographic characteristics, criminal history, select JCAT characteristics, and program participation history and concurrent eligibility. Third, we use regression analysis<sup>26</sup> to examine differences in recidivism for youth in the treatment group and youth in the comparison group.

Fourth, we further limit our subsample to include only those youth who recidivate, conduct updated entropy balancing, and conduct additional regression analyses examining differences in the type of recidivism (i.e., felony vs. misdemeanor).

For each program, we repeat the four analytic steps for each of the subsamples of youth indicated in Exhibit 5. This is a large number of subsamples but is not an exhaustive list of all possible subsamples. Notably, there are an even larger set of combinations of subsamples, (e.g., youth who are high-risk and meet a certain factor). However, resource constraints mean that it is not possible to examine every single combination of these factors.<sup>27</sup>

<sup>26</sup> We use linear probability models for our outcome models. Additional details are provided in Appendix III.

<sup>27</sup> There were over 100 trillion possible combinations of the subgroups that we tested.

Many of the models we examined had limited sample sizes. In some instances, we did not have sufficient sample sizes to test the effects of the program on overall recidivism and/or felony recidivism. In addition, an early step in data processing required us to employ randomization strategies to select a single evaluation per youth, per program. This step was technically necessary to avoid including multiple observations for individuals, including instances where a particular youth may be assigned to both treatment and control groups. This randomization may lead to unstable results that were a product of the selection during the randomization process. To further examine the robustness of our findings, we replicated the analysis five additional times redoing the randomization each time. We considered our results robust if we were able to replicate the significant findings in at least three of the six analytic runs.<sup>28</sup>

We present the specific characteristics associated with reduced recidivism in our main findings. We do not present the magnitudes of these findings because the question in the study concerns which characteristics are associated with higher program effectiveness, not to calculate program effectiveness for a given subgroup. In addition, the magnitudes may be misleading because many individuals in the control group of a given program did participate in other programs.

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<sup>28</sup> Our chosen threshold of required replication is informed by the fact that not all failures to replicate are of concern. Notably, runs may fail to replicate simply because the sample size may hover around the minimum necessary number of observations. In a run or two, the randomization may drop the one observation needed to provide the power to give a statistically significant result. In addition, our findings are meant to be seen as a broad look at eligibility, not as a definitive causal result. This threshold was designed to strike

For example, if a certain characteristic is associated with a 10% increase in recidivism after program participation, this is a good signal that youths with this characteristic may not be good candidates for the program. However, it is not necessarily a good signal of the actual program's effectiveness. This increase in recidivism could be explained by the fact that other programs are more effective for youth with this characteristic and not that the program does harm, since our control group contains individuals who participated in these other programs.<sup>29</sup>

For a more detailed discussion of the method, see [Appendix III](#).

a balance between eliminating subsamples that never replicated, while still casting a wide net. See [Appendix III](#) for more details.

<sup>29</sup> In addition, the randomization step means that we estimated several different magnitudes for every subsample. These would need to be statistically combined. However, given the low number of repetitions, it is unknown if this number would be accurate even when the general pattern of sign and significance is robust.

## IV. Findings

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We conducted independent analyses for each CJAA-funded EBP and present these results separately. [Appendix IV](#) details the full list of criteria that we examined for each program. [Exhibits 6 and 7](#) present the findings for which we identified a therapeutic effect (i.e., a decrease in recidivism) of program participation on overall recidivism, or for which we found no effect on overall recidivism but a therapeutic effect (i.e., a decrease) in felony recidivism among youth who did recidivate (a potential signal of de-escalation) for male and female youth.

We also indicate how robust these findings are using a graduated color scheme in the shading of the findings columns such that a darker shading indicates that the result was found in more replications.

A therapeutic finding indicates that individuals with this characteristic will likely respond to the treatment, either because the treatment fills a need, or because individuals have traits that make them more responsive to treatment. These results should not be used as a definitive list of eligibility requirements but are meant to inform policymakers about which groups respond meaningfully to treatment. In addition, limitations inherent in the data are such that we cannot ensure that these therapeutic effects are caused by the program.

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<sup>30</sup> The most recent evaluation of COS found an overall significant effect on recidivism at the  $p < 0.10$  level. For the current study, we use a higher threshold of significance,  $p < 0.05$ , to account for the number of models tested and to

### Coordination of Services (COS)

We did not identify any significant therapeutic results for the use of COS for male or female youth. The baseline models, testing the overall effectiveness using the full population of youth who were eligible for COS consistently indicated no effect on general recidivism or felony recidivism for male and female youth.<sup>30</sup>

COS was previously used only for low-risk youth, which limited our analysis to the characteristics captured on the pre-screen instrument. It is possible that other factors could be associated with greater therapeutic effects of participation in COS, but we could not reliably examine those characteristics in this study.

### Aggression Replacement Therapy (ART)

#### Male Youth

For male youth, we identified significant therapeutic effects on overall recidivism for youth who were in the lowest quartile of scores on the needs scale for the school domain.<sup>31</sup> Rather than signaling a particular deficit in need of treatment, these findings may suggest that youth who have fewer needs in the school domain (e.g., who have not dropped out of school, who have not been repeatedly suspended from school, or who have connections with adults and/or activities in school) are more likely to see reductions in recidivism following participation in ART.

minimize the likelihood that our significant findings were attributable solely to chance.

<sup>31</sup> See [Appendix III](#) for details about the values associated with each quartile of risk and needs scores.

## Female Youth

For female youth, there were six subgroups for whom we identified a therapeutic effect on overall recidivism and one additional subgroup for whom we identified a therapeutic effect on felony recidivism following participation in ART. Female youth who were currently suspended, dropped out, or expelled from school and female youth who scored in the highest quartile of risk scores on the school domain (domain 2) were less likely to recidivate after participating in ART than similar female youth who did not participate.

In addition to the subgroups with specific school-related risk profiles, female youth who had siblings with current alcohol, drug, mental health, physical health, or employment problems as well as female youth who were in the third highest quartile of risk scores on the family domain also showed a therapeutic reduction in recidivism following participation in ART. Similarly, female youth with elevated, though not the highest risk scores on the drug and alcohol domain also showed a therapeutic reduction in recidivism after ART (domain 5, risk scores 22-36). Female youth who reported a history of physical abuse, either by a family member, in a foster home, and/or with a weapon, also appeared to benefit from participation in ART.

Finally, female youth who usually or sometimes think before acting saw no effect on overall recidivism but did show a significant reduction in felony recidivism. For this subgroup, youth may already have some of the basic skills necessary to internalize the ART curriculum which teaches youth how to react to negative emotions such as anger. If youth already think before acting, ART may be an effective way to teach those youth alternative response options that they can use when faced with negative emotions. While the JCAT does not distinguish between needs and responsivity factors, these findings may be interpreted as identification of the basic skill level that is required for youth to be responsive to the ART program, resulting in a therapeutic change in behavior.

### Exhibit 6

#### Therapeutic Program Participation Effects, Male Youth

Eligibility factor	Overall recidivism effect	Felony recidivism effect
<b>Aggression Replacement Training (ART)</b>		
School, need score -23 to -9	Therapeutic	N/A
<b>Education and Employment Training (EET)</b>		
Criminal history, question 2, 12 or younger at age of first offense	Therapeutic	N/A
Associations, question 13, current friends: Only pro-social friends	Therapeutic	N/A
Family current status, question 2, annual income \$50,000 and over	Therapeutic	N/A
Family current status, question 5, current sibling alcohol, drug, mental health, physical health, &/or employment problem(s)	Therapeutic	N/A
Alcohol and drugs history, question 7, no current drug use	No effect	Therapeutic
Mental health history, question 8, no history of anger/irritability	Therapeutic	N/A
Mental health current status, question 4, no mental health medication currently prescribed	Therapeutic	N/A
<b>Functional Family Therapy (FFT)</b>		
Criminal history, question 2, Age 17 or older at first offense	Therapeutic	N/A
Attitudes/behavior, question 5, believes has no control over own anti-social behavior	No effect	Therapeutic
<b>Multi-Systemic Therapy (MST)</b>		
Criminal history, question 1, 14 at age of assessment	Therapeutic	N/A
Criminal history, question 6, two or more against-person misdemeanor referrals	No effect	Therapeutic
Criminal history, question 8, no detention confinements of 48h+	Therapeutic	N/A
School current status, question 7, recognition for good school behavior, or no problems	Therapeutic	N/A
Associations, question 16, rarely resists anti-social peer influence, or leads anti-social peers	No effect	Therapeutic
Associations, question 2, currently not interested in unstructured activities	No effect	Therapeutic
Family current status, question 15, some family conflict: well managed	Therapeutic	N/A
Family current status, question 2, annual income \$15,000 to \$34,999	No effect	Therapeutic
Attitudes/behavior, question 4, usually or sometimes thinks before acting	No effect	Therapeutic
Mental health, need score 0 to 2	Therapeutic	N/A
Attitudes/behavior, need score -10 to 2	Therapeutic	N/A
Associations, risk score 6 to 15	No effect	Therapeutic

**Notes:**

N/A indicates that the sample size was insufficient to generate results.

The graduated shading in the effect columns represents the number of times the results were replicated across six analytic runs with light grey indicating the findings replicated in three analytic runs and dark grey shading (with white text) indicates that the findings replicated in five out of six analytic runs. There were no therapeutic effects for male youth that replicated across all six analytic runs.

## Exhibit 7

### Therapeutic Program Participation Effects, Female Youth

Eligibility factor	Overall recidivism effect	Felony recidivism effect
<b>Aggression Replacement Therapy (ART)</b>		
School history, question 1, suspended, dropped-out, or expelled from school	Therapeutic	No effect
Family current status, question 5, current sibling alcohol, drug, mental health, physical health, &/or employment problem(s)	Therapeutic	No effect
Mental health history, question 1, physically abused by family member, in a foster home, &/or with a weapon	Therapeutic	No effect
Attitudes/behavior, question 4, usually or sometimes thinks before acting	No effect	Therapeutic
School, risk score 15 to 26	Therapeutic	No effect
Family, risk score 5 to 17	Therapeutic	N/A
Alcohol and drugs, risk score 22 to 36	Therapeutic	No effect
<b>Education and Employment Training (EET)</b>		
Family current status, question 11, consistently appropriate punishment for bad behavior	Therapeutic	N/A
Family current status, question 12, consistently appropriate rewards for good behavior	Therapeutic	N/A
Family current status, question 15, some family conflict: well managed	Therapeutic	N/A
Alcohol and drugs current status, question 4, successfully completed, or currently attending alcohol/drug treatment	Therapeutic	N/A
Mental health history, question 10, history of somatic complaints	Therapeutic	N/A
Mental health history, question 4, history of being a victim of neglect	Therapeutic	N/A
Skills, question 10, never a problem with impulsive behavior, or knows or uses techniques to control impulsive behavior	Therapeutic	N/A
Skills, question 6, often or sometimes uses skills in dealing with difficult situations	Therapeutic	N/A
Attitudes/behavior, need score -10 to 2	Therapeutic	N/A
Skills, need score -15 to -7	Therapeutic	N/A
Mental health, risk score -5 to -2	Therapeutic	N/A
Attitudes/behavior, risk score -3 to 3	Therapeutic	N/A
Skills, risk score -15 to -7	Therapeutic	N/A
<b>Functional Family Therapy (FFT)</b>		
Family current status, question 14, youth feels close to at least one family member	No effect	Therapeutic
Mental health current status, question 2, no current ADD/ADHD diagnosis	No effect	Therapeutic
Attitudes/behavior, need score -10 to 2	No effect	Therapeutic
<b>Multi-Systemic Therapy (MST)</b>		
Alcohol and drugs current status, question 4, currently need alcohol/drug treatment	Therapeutic	N/A
Mental health history, question 1, no history of physical abuse	Therapeutic	N/A
Skills, question 3, identifies problem behaviors, thinks of solutions for problem behaviors, or applies appropriate solutions to problem behaviors	Therapeutic	N/A
Skills, question 5, often or sometimes uses advanced or basic social skills in dealing with others	Therapeutic	N/A
Associations, moderate NLC	Therapeutic	N/A

**Notes:**

N/A indicates that the sample size was insufficient to generate results.

The graduated shading in the effect columns represents the number of times the results were replicated across six analytic runs with light grey indicating the findings replicated in three models and black shading indicates that the findings replicated in all six models.

## Education and Employment Training (EET)

### Male Youth

For male youth participating in EET, we identified six significant therapeutic effects for overall recidivism and three additional therapeutic effects in the reduction of felony recidivism.

Male youth who were younger when they first became court-involved showed therapeutic effects on overall recidivism. Because EET is limited to youth who are at least 15 years old, these findings suggest that EET may be an effective program for male youth who are court-involved over a longer period of time.

Male youth from families with a total income just above the poverty line and males who had siblings with current alcohol, drug, mental health, physical health, or employment problems also showed a therapeutic reduction in recidivism following EET. These findings may indicate the importance of economic opportunities and pro-social relationships outside of the household that can be developed through EET.

Most of the findings for male youth indicating a significant therapeutic effect of EET on recidivism appear to indicate that certain characteristics may signal a youth's readiness to respond to treatment that can support positive outcomes rather than specific needs that should drive program participation. For example, male youth who have only pro-social friends, male youth who have no history of anger or irritability, and male youth who have no mental health medication currently prescribed exhibited therapeutic effects on recidivism following participation in EET.

Similarly, male youth who had no current drug use exhibited a reduction in felony recidivism following participation in EET. Youth who have anti-social friends, youth who have a history of anger/irritability, youth who engaged in problematic drug or alcohol use, and youth with a mental health condition requiring treatment may be less likely to be able to effectively engage in EET. For example, those youth may be less likely to effectively maintain employment without first addressing other treatment needs or skills deficits.

### Female Youth

For female youth, we identified 13 subgroups for which there was a therapeutic reduction in overall recidivism following participation in EET. Like the results for male youth, many of the findings appear to relate to characteristics that may be operating as responsivity barriers rather than needs deficits. Female youth who consistently receive appropriate punishment for bad behavior and awards for good behavior, who live in a household with well-managed family conflict, who previously participated in or had no current need for alcohol/drug treatment, who never had a problem with impulsive behavior or knows/uses techniques to control impulsive behavior, who sometimes or often uses skills in dealing with difficult situations, who scored in the second-lowest quartile for risk scores on the mental health, attitudes/behavior, or skills domains, and who scored in the second-lowest quartile for needs scores on the attitudes/behavior or skills domains exhibited reductions in recidivism following participation in EET. Many of these factors represent skills critical for maintaining employment (e.g., effectively dealing with impulsive behaviors or difficult situations) that may be necessary for youth to fully access the benefits of EET services.

Two additional factors relate less to responsivity but may identify youth who have a greater need for the establishment of pro-social bonds and routine activities that can reduce the risk of recidivism. Specifically, female youth who reported a history of being a victim of neglect and female youth who have a history of somatic complaints saw reductions in recidivism following participation in EET. Both factors capture a youth's history and may not reflect current circumstances (i.e., there is no question about whether the youth is currently experiencing abuse or if the youth is currently reporting somatic complaints). It is unclear whether these factors represent the current needs that EET effectively treats.

### Functional Family Therapy (FFT)

#### Male Youth

For male youth, FFT participation reduced the likelihood of recidivism for youth who were 17 or older at the age of their first offense. This finding may suggest that the FFT curriculum is more accessible to older youth who do not have a history of offending during early adolescence.

Additionally, FFT participation reduced the likelihood of felony recidivism specifically for male youth who had no control over anti-social behaviors. While FFT participation did not fully eliminate recidivism for these youth, it appears that the FFT program does assist in treating behaviors that may lead to more serious types of offending.

#### Female Youth

For female youth, FFT participation did not reduce the overall likelihood of recidivism for any subgroups. However, female youth who reported being close to at least one family member, who had no current ADD/ADHD diagnosis, and who were in the second-lowest quartile for needs scores on the attitudes/behavior domain did show a reduction in the likelihood of felony recidivism. All of these characteristics may indicate these youth may be particularly responsive to FFT.

### Multi-Systemic Therapy (MST)

#### Male Youth

For male youth, participation in MST reduced the likelihood of overall recidivism for youth who were 14 years old at the time of their assessment, youth who had no prior confinement in detention, youth who had no problems in the most recent term at school, youth in families with family conflict that was well managed, and youth on the second-lowest quartile of needs scores for mental health or attitudes/behaviors. Rather than indicating a youth's deficits, these factors refer to positive youth characteristics that may make them more responsive to the MST program.

On the other hand, male youth who had two prior “against-person” misdemeanor referrals, youth who rarely resist anti-social peer influence or lead anti-social peers, youth who are currently uninterested in unstructured activities, youth with a family income just above the poverty line, youth who use self-control or sometimes/usually thinks before acting, and youth who were in the second-highest quartile of risk scores on the associations domain showed no effect on recidivism overall but did show a reduction in the likelihood of felony recidivism following participation in MST. Contrary to the findings for a reduction in overall recidivism, these characteristics are associated with greater needs or higher-risk youth. While participation in MST did not appear to reduce offending overall, it did appear to reduce the seriousness of offending for these youth, potentially signaling a positive impact on the desistance process.

### **Female Youth**

For female youth, participation in MST reduced the likelihood of overall recidivism for female youth who currently need alcohol or drug treatment and youth who had moderate needs level classification on the associations domain.

In addition, MST appeared to reduce the likelihood of general recidivism for female youth with no history of physical abuse, youth who can identify problem behaviors and/or solutions to them, and youth who have and may use basic or advanced social skills in dealing with others. These categories do not include youth who cannot identify problem behaviors or youth who lack basic social skills, but this does not necessarily mean youth have mastered these skills/abilities. MST may build on a youth’s basic foundation to develop advanced skills that may reduce the likelihood of recidivism.

### **Family Integrated Transitions (FIT)**

We did not identify any subgroups of male or female youth for which FIT consistently showed a reduction in overall or felony-specific recidivism. The failure to identify subgroups for which FIT was effective is likely due to small sample sizes. In total, our sample included only 14 female youth and 38 male youth who participated in FIT. Consequently, we lacked the statistical power necessary to accurately evaluate the effectiveness of FIT.

## V. Conclusion

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The findings in this study are not intended to prescribe the exact eligibility criteria for juvenile court EBPs. Rather, the information may be used by practitioners and policymakers to guide decisions about eligibility criteria under the JCAT.

Overall, we found that risk level classification was rarely correlated with program effectiveness. This finding is consistent with prior research that shows that risk factors are less predictive of appropriate treatment fit than needs and responsivity.<sup>32</sup> In addition, the findings are consistent with recent evaluations that found participation in programs may not have an overall therapeutic effect on recidivism, but that some subgroups do appear to uniquely benefit from EBP participation.<sup>33</sup>

Unlike the current eligibility under the PACT, many of our findings indicated the importance of responsivity considerations for effective treatment. While EBPs may be matched to youth who exhibit needs that correspond with a particular type of treatment (e.g., education or employment needs as a reason for referring youth to EET), our findings indicate that treatment may not be appropriate if youth lack certain basic skills or if other needs must first be addressed.

The models in our analysis were independent and we do not make any conclusions about the varying importance of these factors. In addition, many of our analytic models indicated null effects which may be due to limited sample sizes and a consequent lack of statistical power.

Using the information presented in this report, the CJAA committees may make evidence-informed decisions about program eligibility under the JCAT. For example, the courts could decide that youth are eligible if they have one or more of the characteristics we have identified as having a therapeutic response to programming. Alternatively, CJAA could present JPCs with an indication of the total number of characteristics a youth has that are associated with beneficial impacts following program participation. For example, we identified 13 characteristics of female youth that were associated with a reduction in recidivism following participation in EET. Eligibility information in the JCAT could indicate to JPCs how many of those 13 characteristics were present for a particular female youth being assessed for program referrals.

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<sup>32</sup> Brogan, L., Haney-Caron, E., NeMoyer, A., & DeMatteo, D. (2015). Applying the risk-needs-responsivity (RNR) model to juvenile justice. *Criminal Justice Review*, 40(3), 277-302.

<sup>33</sup> Knoth, L., Wanner, P., & He, L. (2019). *Washington State's Aggression Replacement Training for juvenile court youth: Outcome evaluation*. (Doc. No. 19-06-1201). Olympia: Washington State Institute for Public Policy.

The courts may also choose to incorporate theory-driven decisions about eligibility as well. For example, the courts may decide to limit eligibility for EET to youth who are at least moderate- or high-need on the associations or education domains. Since EET is intended to target employment and education deficits, CJAA may not want to use EET resources for youth who are low-need for both education and associations. Future outcome evaluations should be conducted on a program-by-program basis to identify and examine the efficacy of eligibility decisions after the implementation of the JCAT.

### Limitations and Future Research

Research is limited on the importance of responsivity and the importance of appropriately sequencing treatment programs to address certain needs that may act as a barrier to effectively treating other needs. Future research should continue to examine how sequencing may increase the effectiveness of different forms of treatment. For example, if an EBP is found to be ineffective, it may not be because the EBP does not target a youth's needs. Rather, the lack of an effect may indicate that youth are inappropriately or prematurely placed in certain forms of treatment and the benefits of said treatment are unable to be realized.

The JCAT does not specifically distinguish between when characteristics operate as needs and/or responsivity factors. In general, research on responsivity characteristics is extremely limited compared to that of risks and needs. While the characteristics included in the risk and need scales may also reflect responsivity barriers, juvenile probation counselors may be more aware of youth characteristics that determine whether a particular treatment is appropriate or if the youth is "ready" for treatment.

The JCAT focuses on risk factors and criminogenic needs characteristics. There may be other non-criminogenic needs factors that could be treated to reduce future offending behaviors or that may be necessary to address before youth may be responsive to an EBP. Non-criminogenic needs include characteristics like personal distress, distrust, low self-esteem, hostile attribution bias, and peer rejection.<sup>34</sup> Similar to responsivity barriers, JPCs may become aware of these youth characteristics through their interactions with the youth, even though they are not captured systematically on the JCAT. Discretionary decisions about treatment referrals should be rooted in consideration of these types of youth factors.

Due to limitations in the PACT data, we were not able to connect the risk assessment data to criminal court records. As such, we could not identify whether the youth was assessed following conviction from a misdemeanor or felony offense.

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<sup>34</sup> *Ibid.*

In addition to identifying changes in recidivism overall, we attempt to capture de-escalation by identifying whether program participation resulted in a lower likelihood of committing a felony compared to a misdemeanor. While these findings may represent de-escalation (e.g., if the youth was assessed following a felony conviction and then went on to recidivate with a misdemeanor), they may also represent a continuation of behaviors if the initial offense was also a misdemeanor. The JCAT system will include a direct identifier to link assessment records with court data. Future research should leverage this connection to better test for de-escalation of offending behaviors over time.

The process of desistance may also be signaled by changes in risk or needs characteristics. As individuals move through the desistance process, they are more likely to establish and maintain pro-social relationships that reduce the opportunity or motivation for offending behaviors. If research identifies changes in these characteristics, that may further differentiate a program's effectiveness in reducing future criminality.

While the juvenile court RNR system allows for the potential to observe changes in youth characteristics over time, assessments were not administered consistently under the PACT. Therefore, we did not have sufficient data to evaluate changes in risks, needs, or individual factors following participation in juvenile court EBPs.

While this study attempted to simulate youths' scores on the JCAT, differences between the PACT and the JCAT precluded the ability to conduct a perfect simulation. Future research is needed to confirm the findings in this report using actual scores from the JCAT once it is fully implemented.

Finally, we were limited to examining characteristics of youth who were eligible under the existing PACT criteria. As such, we could not examine the full universe of possible treatment groups. The PACT eligibility, which was established using expectations of programmatic theories of change may have effectively targeted the correct risks and needs but failed to consider the potential for responsivity barriers. Populations with null effects (as described in [Appendix IV](#)) may still be appropriate targets for treatment, but CJAA should consider the responsivity characteristics identified in the main body of this report that appear to support the therapeutic effects of program participation.



# Appendices

What Works for Whom? *Juvenile Court Assessment Tool and Program Eligibility*

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Appendices

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## I. PACT and JCAT Coding Differences

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This report used data from the previous risk assessment instruments—the Washington State Juvenile Court Assessment (WSJCA) and the Positive Achievement Change Tool (PACT)—to identify which types of youth under the new JCAT were most responsive to the current menu of juvenile court EBPs. To complete this work, we coded hypothetical JCAT scores for youth who were court involved from 2011 to 2016. This technical appendix describes WSIPP’s approaches to processing the juvenile court assessment records for this study and describes methods used to calculate synthetic JCAT scores.

### Coding JCAT Scores

The ARD includes WSJCA and PACT data from 2004 to 2022. The JCAT items and responses most closely resemble the items and responses on the PACT. In addition, research suggests that the characteristics of the court-involved youth populations may have changed over time. To complete analyses that are both 1) most likely to reflect the hypothetical reality under the JCAT system and 2) most likely representative of current court-involved youth populations, we limit the main analyses in this report to youth assessed under the PACT between 2011 and 2016.

While coding these data, we identified several differences between the WSJCA, the PACT, and the JCAT that left us unable to score youth exactly as they would be scored on the JCAT. In addition, the differences between the WSJCA and PACT created additional complications in trying to establish a consistent synthetic calculation of the JCAT. This appendix reviews the differences between the PACT and JCAT coding for full transparency about these discrepancies. Overall, these differences were relatively infrequent and we believe the overall results from [Section III](#) should still hold moving forward with the JCAT. However, future validations of the JCAT and eligibility criteria should be conducted once enough youth have been assessed using the JCAT and enough youth have completed each of the EBPs to identify program effectiveness.

[Exhibit A1](#) identifies the questions where at least two of the three assessments (WSJCA, PACT, and JCAT) had different response options. The final column in the table describes our coding approach for purposes of calculating JCAT scores. To avoid two different types of bias from the varying answers on the WSJCA and PACT, we ultimately decided to exclude WSJCA assessments from our sample. When the PACT answers did not match the JCAT answers, we used varying coding approaches. In some cases, we combined responses on the PACT into a single category on the JCAT. In some instances, we could not code all of the separate JCAT responses because the responses were previously combined on the PACT. Each of these instances affected our ability to accurately test for eligibility related to the JCAT as it will exist in practice.

**Exhibit A1**

Mapping Differences Between WSCJA, PACT, and JCAT Questions and Responses

Domain	Factor	WSJCA responses	PACT responses	JCAT responses	Other differences	WSIPP coding approach
School	Special education	<ul style="list-style-type: none"> <li>No special education need</li> <li>Behavioral</li> <li>ADHD/ADD</li> <li>Learning</li> <li><b>Mental retardation</b></li> </ul>	<ul style="list-style-type: none"> <li>No special education need</li> <li>Behavioral</li> <li>ADHD/ADD</li> <li>Learning</li> <li><b>Mental retardation</b></li> <li><b>Has an active IEP</b></li> </ul>	<ul style="list-style-type: none"> <li>No special education</li> <li>Behavior</li> <li>ADHD</li> <li>Learning</li> </ul>	<p><b>Question on school history for BOT/PACT and scored if they ever had a special education need. Question on Current School Status for JCAT only looks at the previous 6 months.</b></p>	Used all PACT responses for JCAT since we cannot distinguish between history or current status on PACT. Bolded responses on PACT not included in JCAT coding.
School	Attendance in most recent term	<ul style="list-style-type: none"> <li>Good attendance; few excused absences</li> <li>No unexcused absences</li> <li>Some partial-day unexcused absences</li> <li>Some full-day unexcused absences</li> <li><b>Habitual truant</b></li> </ul>	<ul style="list-style-type: none"> <li>Good attendance; few excused absences</li> <li>No unexcused absences</li> <li>Some partial-day unexcused absences</li> <li>Some full-day unexcused absences</li> <li><b>Habitual truant</b></li> </ul>	<ul style="list-style-type: none"> <li>Good attendance; few excused absences</li> <li>No unexcused absences</li> <li>Some partial-day unexcused absences</li> <li>Some full-day unexcused absences</li> <li><b>Truancy petition/equivalent or withdrawn</b></li> </ul>		Coded Habitual Truant as truancy petition/equivalent or withdrawn.
Employment	Interest in employment	<ul style="list-style-type: none"> <li><b>Currently employed</b></li> <li><b>Too young for employment consideration</b></li> <li><b>Not employed but highly interested in employment</b></li> <li><b>Not employed but somewhat interested in employment</b></li> <li><b>Not employed and not interested in employment</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Highly interested in current employment/obtaining employment</b></li> <li><b>Somewhat interested in current employment/obtaining employment</b></li> <li><b>Not interested in current employment/obtaining employment</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Currently employed</b></li> <li><b>Highly interested in employment</b></li> <li><b>Somewhat interested in employment</b></li> <li><b>Not interested in employment</b></li> <li><b>Too young for employment</b></li> </ul>		Only coded high interest, somewhat interest, and no interest, based on PACT responses.
Employment	History of successful employment	<ul style="list-style-type: none"> <li>Has been successfully employed</li> <li>Never successfully employed</li> </ul>	<p><b>Select all that apply for a maximum of 2 points:</b></p> <ul style="list-style-type: none"> <li>Has been successfully employed</li> <li><b>Fired or quit because of poor performance</b></li> <li><b>Fired or quit because he or she could not get along with employer or coworkers</b></li> </ul>	<ul style="list-style-type: none"> <li>Has been successfully employed</li> <li><b>Never successfully employed</b></li> </ul>		Could not code factor for never successfully employed using PACT data. Only coded Has been successfully employed for JCAT.
Associations	History of friends and companions	<p><b>Select only one:</b></p> <ul style="list-style-type: none"> <li>Never had consistent friends or companions</li> <li>Had pro-social friends</li> <li>Had anti-social friends</li> <li>Had pro-social and anti-social friends</li> <li>Been a gang member/associate</li> </ul>	<p><b>Select all that apply for maximum of 3 points:</b></p> <ul style="list-style-type: none"> <li>Never had consistent friends or companions</li> <li>Had pro-social friends</li> <li>Had anti-social friends</li> <li>Been a gang member/associate</li> </ul>	<p><b>Select only one:</b></p> <ul style="list-style-type: none"> <li>Only pro-social friends</li> <li>No consistent friends or companions</li> <li>Mix of pro-social and anti-social friends</li> <li>Only anti-social friends</li> <li>Gang member/associate</li> </ul>		Selected the most serious response on the PACT for the JCAT coding.

**Exhibit A1 (cont.)**

Mapping Differences Between WSCJA, PACT, and JCAT Questions and Responses

Domain	Factor	WSCJA responses	PACT responses	JCAT responses	Other differences	WSIPP coding approach
Associations	Current friends and companions	<p><b>Select only one:</b></p> <ul style="list-style-type: none"> <li>No consistent friends or companions</li> <li>Has pro-social friends</li> <li>Has anti-social friends</li> <li>Has pro-social and anti-social friends</li> <li>Is a gang member/associate</li> </ul>	<p><b>Select all that apply for maximum of 3 points:</b></p> <ul style="list-style-type: none"> <li>No consistent friends or companions</li> <li>Has pro-social friends</li> <li>Has anti-social friends</li> <li>Is a gang member/associate</li> </ul>	<p><b>Select only one:</b></p> <ul style="list-style-type: none"> <li>Only pro-social friends</li> <li>No consistent friends or companions</li> <li>Mix of pro-social and anti-social friends</li> <li>Only anti-social friends</li> <li>Gang member/associate</li> </ul>		Selected the highest scoring response for the JCAT coding.
Family	Dependency petitions	<p><b>Select all that apply for a maximum of 3 points:</b></p> <ul style="list-style-type: none"> <li>ARY petition filed</li> <li>ARP petition filed</li> <li>CHINS petition filed</li> <li>Dependency petition filed</li> </ul>	<ul style="list-style-type: none"> <li>No dependency petitions filed</li> <li>Dependency petition(s) filed</li> </ul>	<ul style="list-style-type: none"> <li>No dependency petitions</li> <li>1 petition</li> <li>At least 2 petitions</li> </ul>		Anyone coded as having a dependency petition filed on the WSCJA or PACT were coded as "1 petition" on the JCAT.
Family	Current living situation	<p><b>Select all for a maximum of 4 points:</b></p> <ul style="list-style-type: none"> <li>Living alone</li> <li>Transient (street, moving around)</li> <li>Biological mother</li> <li>Biological father</li> <li>Non-biological mother</li> <li>Non-biological father</li> <li>Older sibling(s)</li> <li>Younger sibling(s)</li> <li>Grandparent(s)</li> <li>Other relative(s)</li> <li><b>Long-term parental partner(s)</b></li> <li><b>Short-term parental partner(s)</b></li> <li><b>Minor's romantic partner</b></li> <li><b>Minor's child</b></li> <li><b>Foster/group home</b></li> <li><b>Minor's friends</b></li> <li><b>Family friend</b></li> <li><b>Parent's roommate</b></li> </ul>	<p><b>Select all for a maximum of 4 points:</b></p> <ul style="list-style-type: none"> <li>Living alone</li> <li>Transient (street, moving around)</li> <li>Biological mother</li> <li>Biological father</li> <li>Non-biological mother</li> <li>Non-biological father</li> <li>Older sibling(s)</li> <li>Younger sibling(s)</li> <li>Grandparent(s)</li> <li>Other relative(s)</li> <li><b>Long-term parental partner(s)</b></li> <li><b>Short-term parental partner(s)</b></li> <li><b>Minor's romantic partner</b></li> <li><b>Minor's child</b></li> <li><b>Foster/group home</b></li> <li><b>Minor's friends</b></li> <li><b>Family friend</b></li> <li><b>Parent's roommate</b></li> </ul>	<p><b>Select all that apply:</b></p> <ul style="list-style-type: none"> <li>Living alone</li> <li>Living transient</li> <li>Biological or non-biological mother</li> <li>Biological or non-biological father</li> <li>Sibling(s)</li> <li>Grandparent(s)</li> <li>Foster/group home</li> <li>Other relative(s)</li> <li>Other adult(s)</li> </ul>		Bolded responses on PACT not included in synthetic JCAT coding.
Family	Combined household income	<ul style="list-style-type: none"> <li>Annual income under \$15,000</li> <li>Annual income \$15,000 to \$34,999</li> <li>Annual income \$35,000 to \$49,999</li> <li>Annual income \$50,000 and over</li> </ul>	<ul style="list-style-type: none"> <li>Below poverty line</li> <li>Up to poverty line x 2</li> <li>Up to poverty line x 3</li> <li>Up to poverty line x 4</li> </ul>	<ul style="list-style-type: none"> <li>Annual income under \$15,000</li> <li>Annual income \$15,000 to \$34,999</li> <li>Annual income \$35,000 to \$49,999</li> <li>Annual income \$50,000 and over</li> </ul>		PACT categories coded into four JCAT categories on a one-to-one bases. For example, "below poverty line" was coded as "annual income under \$15,000," "up to poverty line x2" was coded as "annual income \$15,000 to \$34,999"

**Exhibit A1 (cont.)**

Mapping Differences Between WSCJA, PACT, and JCAT Questions and Responses

Domain	Factor	WSJCA responses	PACT responses	JCAT responses	Other differences	WSIPP coding approach
Family	History of family member incarceration	<p><b>Select all that apply for a maximum of 3 points:</b></p> <ul style="list-style-type: none"> <li>No jail/imprisonment history in family</li> <li>Mother/female caretaker</li> <li>Father/male caretaker</li> <li>Older sibling</li> <li>Younger sibling</li> <li>Other member</li> </ul>	<p><b>Select all that apply for a maximum of 3 points:</b></p> <ul style="list-style-type: none"> <li>No jail/imprisonment history in family</li> <li>Mother/female caretaker</li> <li>Father/male caretaker</li> <li>Older sibling</li> <li>Younger sibling</li> <li>Other member</li> </ul>	<p><b>Select all that apply:</b></p> <ul style="list-style-type: none"> <li>No jail/imprisonment history in family</li> <li>Mother/female caretaker history jail/imprisonment</li> <li>Father/male caretaker history jail/imprisonment</li> <li>Sibling history jail/imprisonment</li> </ul>		Combined PACT responses to fit new JCAT categories.
Family	History of family member incarceration	<p><b>Select all that apply for a maximum of 3 points:</b></p> <ul style="list-style-type: none"> <li>No jail/imprisonment history in family</li> <li>Mother/female caretaker</li> <li>Father/male caretaker</li> <li>Older sibling</li> <li>Younger sibling</li> <li>Other member</li> </ul>	<p><b>Select all that apply for a maximum of 3 points:</b></p> <ul style="list-style-type: none"> <li>No jail/imprisonment history in family</li> <li>Mother/female caretaker</li> <li>Father/male caretaker</li> <li>Older sibling</li> <li>Younger sibling</li> <li>Other member</li> </ul>	<p><b>Select all that apply:</b></p> <ul style="list-style-type: none"> <li>No jail/imprisonment history in family</li> <li>Current mother/female caretaker jail/imprisonment</li> <li>Current father/male caretaker jail/imprisonment</li> <li>Current sibling jail/imprisonment</li> <li>Current other family member jail/imprisonment</li> </ul>		Combined PACT responses to fit new JCAT categories.

**Exhibit A1 (cont.)**

Mapping Differences Between WSCJA, PACT, and JCAT Questions and Responses

Domain	Factor	WSJCA responses	PACT responses	JCAT responses	Other differences	WSIPP coding approach
Drugs and alcohol	History of alcohol use	<p><b>Select all that apply for maximum of 6 points:</b></p> <ul style="list-style-type: none"> <li>No use of alcohol</li> <li>Past use of alcohol</li> <li>Alcohol disrupted education</li> <li>Alcohol caused family conflict</li> <li>Alcohol interfered with keeping pro-social friends</li> <li>Alcohol caused health problems</li> <li>Alcohol contributed to criminal behavior</li> </ul>	<p><b>Select all that apply for a maximum of 6 points</b></p> <ul style="list-style-type: none"> <li>No use of alcohol</li> <li>Past use of alcohol</li> <li>Alcohol disrupted education</li> <li>Alcohol caused family conflict</li> <li>Alcohol interfered with keeping pro-social friends</li> <li>Alcohol caused health problems</li> <li>Alcohol contributed to criminal behavior</li> <li><b>Minor needed increasing amounts of alcohol to achieve same level of intoxication or high</b></li> <li><b>Minor experienced withdrawal problems</b></li> </ul>	<p><b>Select all that apply:</b></p> <ul style="list-style-type: none"> <li>No use of alcohol</li> <li>Past alcohol use</li> <li>Alcohol disrupted education</li> <li>Alcohol caused family conflict</li> <li>Alcohol interfered with keeping pro-social friends</li> <li>Alcohol caused health problems</li> <li>Alcohol contributed to criminal behavior</li> <li><b>Needs increasing amounts of alcohol to achieve same level of intoxication or high</b></li> <li><b>Experienced withdrawal problems</b></li> </ul>		Did not include WSJCA Assessments
Drugs and alcohol	History of drug use	<p><b>Select all that apply for maximum of 13 points:</b></p> <ul style="list-style-type: none"> <li>No past use of drugs</li> <li>Past use of drugs</li> <li>Drugs disrupted education</li> <li>Drugs caused family conflict</li> <li>Drugs interfered with keeping pro-social friends</li> <li>Drugs caused health problems</li> <li>Drugs contributed to criminal behavior</li> </ul>	<p><b>Select all that apply for maximum of 13 points:</b></p> <ul style="list-style-type: none"> <li>No past use of drugs</li> <li>Past use of drugs</li> <li>Drugs disrupted education</li> <li>Drugs caused family conflict</li> <li>Drugs interfered with keeping pro-social friends</li> <li>Drugs caused health problems</li> <li>Drugs contributed to criminal behavior</li> <li><b>Minor needed increasing amounts of drugs to achieve same level of intoxication or high</b></li> <li><b>Minor experienced withdrawal problems</b></li> </ul>	<p><b>Select all that apply:</b></p> <ul style="list-style-type: none"> <li>No use of drugs</li> <li>Past drug use</li> <li>Drugs disrupted education</li> <li>Drugs caused family conflict</li> <li>Drugs interfered with keeping pro-social friends</li> <li>Drugs caused health problems</li> <li>Drugs contributed to criminal behavior</li> <li><b>Needs increasing amounts of drugs to achieve same level of intoxication or high</b></li> <li><b>Experienced withdrawal problems</b></li> </ul>		Did not include WSJCA Assessments
Drugs and alcohol	History of participating in alcohol/drug treatment	<ul style="list-style-type: none"> <li>Never participated in treatment program</li> <li>Participated once in treatment program</li> <li>Participated several times in treatment program</li> </ul>	<ul style="list-style-type: none"> <li>Never participated in treatment program</li> <li>Participated once in treatment program</li> <li>Participated several times in treatment program</li> </ul>	<ul style="list-style-type: none"> <li><b>No alcohol or drug issues</b></li> <li>Participated once in drug/alcohol treatment</li> <li>Participated several times in drug/alcohol treatment</li> <li>Never participated in drug/alcohol treatment</li> </ul>	There were instances on the PACT where someone who recorded as having no history of alcohol or drug use on other questions were scored as "never participated in treatment program" on PACT.	Only coded JCAT responses for never, once, or several times if they had past use of drugs and/or alcohol.

**Exhibit A1 (cont.)**

Mapping Differences Between WSCJA, PACT, and JCAT Questions and Responses

Domain	Factor	WSJCA responses	PACT responses	JCAT responses	Other differences	WSIPP coding approach
Mental health	History of depression and anxiety	Not included on BOT	<ul style="list-style-type: none"> <li>No history of depression/anxiety</li> <li><b>Occasional feelings of depression/anxiety</b></li> <li><b>Consistent feelings of depression/anxiety</b></li> <li><b>Impairment in everyday tasks due to depression/anxiety</b></li> </ul>	<p><b>Select all that apply:</b></p> <ul style="list-style-type: none"> <li>No history of depression and anxiety</li> <li><b>History of depression</b></li> <li><b>History of anxiety</b></li> </ul>		Cannot distinguish anxiety and depression on PACT. All grouped in one category (anxiety) on JCAT coding.
Mental health	Current suicide ideation	<p>Select all that apply:</p> <ul style="list-style-type: none"> <li>Does not have serious thoughts about suicide</li> <li>Has serious thoughts about suicide</li> <li>Has recently made a plan to commit suicide. If yes, describe: _____</li> <li>Has recently attempted to commit suicide. If yes, describe attempts and dates: _____</li> </ul>	<p>Select all that apply:</p> <ul style="list-style-type: none"> <li>Does not have serious thoughts about suicide</li> <li>Has serious thoughts about suicide</li> <li>Has recently made a plan to commit suicide. If yes, describe: _____</li> <li>Has recently attempted to commit suicide. If yes, describe attempts and dates: _____</li> <li><b>Feels life is not worth living – no hope for future</b></li> <li><b>Knows someone well who has committed suicide. If yes, who, when and how: _____</b></li> <li><b>Engages in self-mutilating behavior: _____</b></li> </ul>	<p>Select all that apply:</p> <ul style="list-style-type: none"> <li>No recent thoughts of suicide</li> <li>Recent serious thoughts of suicide</li> <li>Recently planned suicide</li> <li>Recently attempted suicide</li> </ul>		Bolded responses on PACT not included in synthetic JCAT coding.
Attitudes/behavior	Primary purpose for committing last crime	<ul style="list-style-type: none"> <li>N/A</li> <li><b>Anger</b></li> <li><b>Revenge</b></li> <li>Impulse</li> <li>Sexual desire</li> <li>Money or material gain, including drugs</li> <li>Excitement, amusement or fun</li> <li>Peer status, acceptance or attention</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> <li><b>Anger/revenge</b></li> <li>Impulse</li> <li>Sexual desire</li> <li>Money or material gain, including drugs</li> <li>Excitement, amusement or fun</li> <li>Peer status, acceptance or attention</li> <li><b>Power/control</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Anger</b></li> <li><b>Revenge</b></li> <li>Impulse</li> <li>Sexual desire</li> <li>Money or material gain, including drugs or alcohol</li> <li>Excitement, amusement, or fun</li> <li>Peer status, acceptance, or attention</li> </ul>	<p>PACT question based on "crimes within the last 6 months." JCAT based on "last crime" only.</p>	<p>Cannot distinguish Anger and Revenge responses on the PACT, so all coded as anger on the JCAT.</p> <p>Power/control not included on JCAT so not coded.</p>

**Exhibit A1 (cont.)**

Mapping Differences Between WSCJA, PACT, and JCAT Questions and Responses

Domain	Factor	WSJCA responses	PACT responses	JCAT responses	Other differences	WSIPP coding approach
Attitudes/behavior	Attitude toward pro-social rules and responsible law-abiding behavior	<ul style="list-style-type: none"> <li>• <b>Abides by conventions/values</b></li> <li>• Believes some pro-social rules/conventions apply to him or her</li> <li>• Does not believe pro-social rules/conventions apply to him or her</li> <li>• Resents or is hostile toward pro-social rules/conventions</li> </ul>	<ul style="list-style-type: none"> <li>• Believes pro-social rules/conventions apply to him or her</li> <li>• Believes some pro-social rules/conventions apply to him or her</li> <li>• Does not believe pro-social rules/conventions apply to him or her</li> <li>• Resents or is hostile toward pro-social rules/conventions</li> </ul>	<ul style="list-style-type: none"> <li>• Believes pro-social rules/laws apply</li> <li>• Believes pro-social rules/laws sometimes apply</li> <li>• Does not believe pro-social rules/laws apply</li> <li>• Resents or is defiant toward rules/laws</li> </ul>		Did not use WSJCA assessments
Aggression	Reports/evidence of violence not included in criminal history	<ul style="list-style-type: none"> <li>• No reports/evidence of violence outside of criminal history</li> <li>• Violent destruction of property</li> <li>• Violent outbursts, displays of temper, uncontrolled anger indicating potential for harm</li> <li>• Deliberately inflicted physical pain</li> <li>• Used/threatened with a weapon</li> <li>• Fire starting reports</li> <li>• Animal cruelty reports</li> </ul>	<ul style="list-style-type: none"> <li>• No reports/evidence of violence outside of criminal history</li> <li>• Violent destruction of property</li> <li>• Violent outbursts, displays of temper, uncontrolled anger indicating potential for harm</li> <li>• Deliberately inflicted physical pain</li> <li>• Used/threatened with a weapon</li> <li>• Fire starting reports</li> <li>• Animal cruelty reports</li> </ul>	<p><b>History of reports/evidence of violence not included in criminal history:</b></p> <ul style="list-style-type: none"> <li>• No reports/evidence of violence outside of criminal history</li> <li>• Violent destruction of property</li> <li>• Violent outbursts, displays of temper, uncontrolled anger indicating potential for harm</li> <li>• Deliberately inflicted physical pain</li> <li>• Used/threatened with a weapon</li> <li>• Fire starting reports</li> <li>• Animal cruelty reports</li> </ul> <p><b>Current reports/evidence of violence not included in criminal history:</b></p> <ul style="list-style-type: none"> <li>• <b>No reports/evidence of violence outside of criminal history</b></li> <li>• <b>Violent destruction of property</b></li> <li>• <b>Violent outbursts, displays of temper, uncontrolled anger indicating potential for harm</b></li> <li>• <b>Deliberately inflicted physical pain</b></li> <li>• <b>Used/threatened with a weapon</b></li> <li>• <b>Fire starting reports</b></li> <li>• <b>Animal cruelty reports</b></li> </ul>	<p>On PACT, initial assessments included the entire history of reports. On Reassessments and final assessments, only looks at last four weeks.</p>	Cannot distinguish current or history on PACT. Therefore, we only coded the history question on JCAT and not the current question
Aggression	Reports and evidence of sexual aggression not included in criminal history	<ul style="list-style-type: none"> <li>• No reports/evidence of sexual aggression</li> <li>• <b>Aggressive sex</b></li> <li>• <b>Sex for power</b></li> <li>• <b>Young sex partners</b></li> <li>• <b>Child sex</b></li> <li>• Voyeurism</li> <li>• Exposure</li> </ul>	<ul style="list-style-type: none"> <li>• No reports/evidence of sexual aggression</li> <li>• <b>Aggressive sex</b></li> <li>• <b>Sex for power</b></li> <li>• <b>Young sex partners</b></li> <li>• <b>Child sex</b></li> <li>• Voyeurism</li> <li>• Exposure</li> </ul>	<p><b>History of reports/evidence of sexual aggression not included in criminal history:</b></p> <ul style="list-style-type: none"> <li>• No reports of sexual aggression outside of criminal history</li> <li>• <b>Sex for power or aggressive sex</b></li> <li>• <b>Child sex or young sex partners</b></li> <li>• Voyeurism</li> <li>• Exposure</li> </ul> <p><b>Current reports/evidence of sexual aggression not included in criminal history:</b></p> <ul style="list-style-type: none"> <li>• <b>No reports of sexual aggression outside of criminal history</b></li> <li>• <b>Sex for power or aggressive sex</b></li> <li>• <b>Child sex or young sex partners</b></li> <li>• <b>Voyeurism</b></li> <li>• <b>Exposure</b></li> </ul>	<p>On PACT, initial assessments included the entire history of reports. On Reassessments and final assessments, only looks at last four weeks. For JCAT, separate questions based on history and current.</p>	Cannot distinguish current or history on PACT. Therefore, we only coded the history question on JCAT and not the current question

In addition to these differences, some questions on the PACT were fully removed from the JCAT. Specifically, the JCAT excludes the following:

- Criminal history domain: sexual misconduct misdemeanor referrals
- Criminal history domain: felony sex offense referrals
- School domain: Type of school in which minor is enrolled
- Associations domain: History of structured recreational activities
- Associations domain: History of unstructured pro-social recreational activities
- Associations domain: Types of structured recreational activities in which minor currently participates
- Employment domain: History of Employment
- Mental health domain: History of suicidal ideation
- Mental health domain: History of thought disturbance
- Mental health domain: History of traumatic experience

There was one additional question on the JCAT that was not included on the PACT but that we were able to estimate using available data. Specifically, the JCAT includes a factor for age at the time of the assessment in addition to age at offense which was included on both the PACT and JCAT. We calculated age at assessment using the date of the PACT assessment and the individual's date of birth.

## II. Data

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The current study assesses varying effects of participation in juvenile court EBPs based on youth characteristics. We limited our sample to youth assessed under the PACT for two reasons. First, the previous appendix describes differences between the WSJCA and PACT that would have introduced two separate types of bias in the final synthetic JCAT coding. Second, recent studies suggest that there may be changes in the court-involved youth populations over time. By using the PACT records, our sample includes youth who were most recently in the juvenile justice system and who may be most likely to reflect the characteristics of court-involved youth today.

The PACT was administered from 2011 to 2022. Due to limitations in WSIPP's court records<sup>35</sup> and the need to monitor youth in our sample for 30 months to assess recidivism, we limited our sample to youth who were assessed between 2011 and 2016.

### Selecting Assessments in Sample

When youth are referred to a local probation office, they are first administered a pre-screen instrument consisting of select questions from the criminal history domain and various social need domains. Individuals who cross a certain threshold of points on the prescreen are then administered a longer, full assessment. While on probation, JPCs may administer a reassessment at their discretion. Prior to release from probation, JPCs must complete a final reassessment. Consequently, for one conviction of a criminal offense, youth may have three or more assessments (a prescreen, an initial full assessment, and a final full assessment).

PACT assessments in the Assessment Research Database (ARD) do not have a unique identifier that can link different assessments associated with the same juvenile court conviction. Our first step in processing these data was to group assessments based on the type of assessment and the date the assessment was completed. First, we identified each youth's first pre-screen or initial full assessment. We then assigned a unique identifier to all subsequent assessments for that youth until reaching a new prescreen or initial assessment. [Exhibit A2](#) provides a visual representation of this process. In this hypothetical example, the same youth (the unique identifier is denoted "logon\_id") had four trips through the juvenile justice system. On their first trip, they had a prescreen, an initial assessment, a reassessment, and a final assessment. On their second trip, they were not administered a prescreen. On their third trip, they were not administered a prescreen, reassessment, or final assessment.

There is one special type of reassessment that functions as the equivalent of an initial assessment—reassessments after conviction for a new offense. If a youth who are on community supervision commit a new offense, they must be administered a new full assessment. Since this assessment is the first assessment after conviction of an offense, it serves as the initial assessment associated with the new court case. However, since the youth was already on supervision when the second conviction occurred, it is recorded as a special type of reassessment. For this study, we treat assessments recorded as "reassessment – new offense" as a separate initial assessment. This process is illustrated in the fourth set of assessments in [Exhibit A2](#).

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<sup>35</sup> In 2019, King County withdrew from the Administrative Office of the Court's (AOC's) statewide record system. To date, AOC is still developing new methods to integrate records from King County's independent database to the centralized state system. Consequently, WSIPP's Criminal History Database has incomplete records after April 2019 and cannot be used to measure recidivism in subsequent years.

**Exhibit A2**  
Connecting Youth Assessments

Logon_ID	Assessment_ID	Assessment type	Assessment start date	Group_ID	Keep
123456	23456	prescreen	1/2/2012	1	No
123456	34567	initial	1/15/2012	1	Yes
123456	45678	reassessment	4/5/2012	1	No
123456	56789	final	8/9/2012	1	No
123456	67890	initial	2/6/2013	2	Yes
123456	78901	reassessment	5/9/2013	2	No
123456	89012	final	6/10/2013	2	No
123456	90123	initial	6/11/2013	3	Yes
123456	12345	reassessment – new offense	8/10/2013	4	Yes
123456	54321	final	1/15/2014	4	No

During the timeframe of our sample, reassessments were not required nor were they administered in any consistent basis. Rather, reassessments were administered at the discretion of the JPC. Similarly, some courts opted not to administer the prescreen and used only the full assessment for all individuals entering their jurisdiction. Consequently, youth were most consistently administered a prescreen and/or initial assessment and, for those administered an initial assessment, a final assessment.

For purposes of our study, we were interested in examining the outcomes for youth who were eligible for a juvenile court EBPs. Only one program (COS) has eligibility tied to the results of the prescreen. Eligibility for all other EBPs depends on a youth’s score on a full assessment. Eligibility can change between initial assessments and reassessments. However, since reassessments were not consistently administered, using eligibility tied to results from a reassessment may bias our sample. Additionally, final assessments were administered prior to release from community supervision and would not be used to determine program eligibility or placement. Consequently, *we limited our sample of observations to only prescreens, initial assessments, and reassessments for a new offense.* Exhibit A2 indicates which assessments would remain in our sample for the hypothetical individual.

Identifying Interventions in Sample

Under the PACT, youth who were eligible for an EBP had an associated program record created in the “interventions” table in the ARD data. JPCs may choose to place the youth in an eligible EBP, another local program, or no programming. If a JPC chooses not to refer an eligible youth to an EBP, they can change the youth’s status for that EBP from “eligible” to “not started” and indicate the reason the youth did not start the program (e.g., referred to a different EBP). If the JPC does refer the youth to the program, they can change the EBP status from “eligible” to “started” and record a start date.

Not all youth complete EBPs. If the youth failed to complete an EBP, the JPC can change the youth’s status for that EBP from “started” to “not completed” and indicate the reason the youth did not complete the program (e.g., dropped out). If the youth does complete the program, the JPC can change the youth’s status for that EBP from “started” to “completed” and record a date of completion.

We selected all interventions corresponding to youth in our sample. Intervention records are associated with a particular prescreen or initial assessment. Under the PACT, courts were able to “turn off” program eligibility for programs that were not offered in their court. To account for this missingness, we also manually calculated eligibility using the PACT data from initial assessments and the PACT eligibility criteria.

We omitted trips if the reason a youth did not start a program indicated that they were systematically different from those in the program. Specifically, we omitted those who were “awaiting or involved in inpatient drug treatment,” “committed to JRA,” “deceased,” “incarcerated,” had “whereabouts unknown,” “on warrant status,” or who “moved or is moving out of state.” These are individuals that would be a poor control for the treatment group. For example, those who are deceased are unable to recidivate, so including them in the control group would lead to bias if the control group consists of individuals who cannot recidivate.

We then assigned individuals to the treatment group for a given program if they started the program and assigned individuals to the control group if they did not start the program. The fact that some individuals participated in other programs slightly changes the interpretation of our results. Notably, an iatrogenic effect could signal simply that other programs are more effective for individuals with this characteristic.

Upon review of intervention records, we found patterns in the data that called into question the reliability of the program record. There were some instances where the youth had two records for the same EBP, one with the eligibility, start, and completion date on the same day and a second record with the eligibility date, start date, and completion date being three separate days. After consulting with individuals at AOC (which houses the ARD data) it was discovered that there were aspects of the PACT software that created errors in the interventions table. We identified three general issues: 1) unreliable eligibility, start, or completion dates; 2) multiple intervention records for the same program associated with the same assessment; and 3) interventions associated with the incorrect assessment record.

#### *Identifying Unreliable Intervention Records*

Juvenile EBPs take place over a series of days, weeks, or months. However, the interventions table included records where the youth was reported to have started and completed the program on the same day. These cases most likely result from a data entry error. In the PACT software, a single date field is used to fill in eligibility, start, and completion dates. When a youth’s status is updated (e.g., from eligible to started), the JPC should enter that date in the status field, which will assign that date as the date the new status began (e.g., start date or completion date). Records with the same start and completion date likely result from JPCs incorrectly changing the status of the program or trying to remove the eligibility record. We marked records as unlikely program starts if they had the same start and completion dates and dropped them from the analysis.

#### *Multiple Intervention Records for the Same Program Linked to the Same Assessment*

It is possible for youth to participate in the same program multiple times. For example, if the youth drops out of the program, the JPC would mark the associated record as “not completed” and provide a reason for the failure. If the JPC later decides that the youth is ready to restart the program, they may reenlist the youth and create a new intervention record in the PACT software. We do not consider such cases to be separate program starts. Rather, we consider the second start to be a restart of the program. We developed a set of rules to address instances where a youth had multiple intervention records associated with the same program and the same assessment and to consolidate them into a single record. After filtering out the unlikely starts described in the previous section, we treated these scenarios in the following ways:

- No program starts, we retained their first eligibility record;
- One program start, we retained the corresponding record;
- Multiple program starts and no completions, we retained their first program start record;
- Multiple program starts and one completion, we consolidated their first start date and their completion date into a single record;
- Multiple program starts and multiple completions, we retained their first completion record.

After applying these rules, each youth has at most one record associated with a program-assessment combination. Youth were either not eligible, eligible but did not start the program, eligible and started but did not complete the program, or eligible and completed the program.

#### *Intervention Records Linked to the Wrong Assessment*

We found some instances where intervention records appeared to be linked to the wrong assessment. For example, take the case where a youth had an initial assessment and a reassessment. The youth had an ART program start linked to their initial assessment. However, the program start date for ART was after the reassessment was completed. There was no record for ART associated with the reassessment, but the youth should have been eligible.

AOC investigated this issue and found that the mismatch was due to the programming conditions in the PACT software. Specifically, when a JPC completes a reassessment, an eligibility record for a program will occur only if there is not already an open eligibility record for that same youth. Using the example above, it appears that the JPC decided not to place the youth in ART after their initial assessment, but the JPC did not change the status for that ART record to be “not started.” Thus, the status of the ART remained as “eligible.” Several months later, the JPC completed a reassessment for the youth and decided to refer the youth to ART. Since the youth already had an open eligibility record for ART, when the JPC changes the ART status from “eligible” to “started,” it updated the intervention record associated with the initial assessment and not the reassessment.

For our study, we needed to be sure that interventions were linked to the correct assessment information. To account for these errors, we changed the assessment linked to the intervention record in some instances. Specifically, if a program start date associated with one assessment was on or after the completion of a future assessment, then we linked the intervention information with the future assessment. We removed the intervention information from the initial assessment (the assessment originally linked to the intervention) and changed the status from started/completed to eligible-not started.

In other instances, a youth completed an assessment and started a program, then completed a second assessment and was deemed eligible for the same program, and then completed the program. In such cases, we dropped the eligibility record from the second intervention from our sample, as the youth was already actively participating in the program at the time of assessment.

#### *Timing of Assessment*

We made one final adjustment to these records to strengthen the reliability of our dataset. Specifically, we excluded records where the start of a program was more than 540 days after the start of the associated risk assessment or was more than 7 days before the start of the associated risk assessment. These records likely have an error in the assessment date or program dates or are outliers that are unlikely to represent the standard experience with juvenile probation and participation in EBPs.

### *Recidivism Follow-up Date for Comparison Observations*

Youth on local supervision may not immediately receive a referral to an EBP and those who do receive a referral may not immediately begin participating in the EBP. For this study, our interest is in whether or not participating in a particular program reduced a youth's likelihood to recidivate. As such, we start the follow-up period for youth who participated in an EBP on the start date of the EBP as listed in the ARD data.

For youth in the comparison group, we created a hypothetical date on which they would have started treatment if they did receive a referral to a particular EBP. To create these hypothetical start dates, we examined the median time to program start after the completion of a risk assessment for youth in the treatment group. For example, if the median time to starting program X was 25 days after the completion of a risk assessment, we started the follow-up period for youth in the comparison group for program X 25 days after the completion of the risk assessment for which they were eligible to participate in program X.

Some youth may not start an EBP because they re-offend while on supervision, prior to receiving an EBP referral. To account for this potential bias in the comparison group, we excluded youth if the reason for not participating noted by the JPC in the ARD was related to subsequent offending behaviors or confinement in a JR facility.

### *Randomization of Multiple Trips*

After making the changes described above, we had a single intervention record for each program for each initial or prescreen assessment for each youth. However, individuals may still be included in the dataset multiple times. In the example above, the individual had four different trips through the system. In every instance, the individual may have been eligible to participate in programs.

Including every trip in any regression is problematic because of the dependency between these observations. This dependency violates assumptions underlying the empirical approach and therefore is not optimal to include more than one trip per person. In addition, including multiple trips per person will implicitly overweight these individuals with multiple trips. For example, an individual with two trips will be weighted twice as much as an individual who only appears once. More concerningly, the youth with two trips is the youth who recidivated and returned to the system, so including all of these trips would weight youth who recidivated more heavily than those who did not. As an additional nuance, there are some youth with a trip that would qualify them to be in the control group and a trip that would qualify them to be in the treatment group. Including both would then put these individuals in both groups simultaneously.

For these reasons, we only include one observation per individual in the analysis. The decision of which trip to select is non-trivial. One option is to select the first trip. However, because every one of these individuals had multiple trips, every youth recidivated after the first trip. There may be an association between being in the system multiple times and being referred to a program, so this approach could bias our estimated effects. Instead, we select the trip randomly. The randomization occurs in two steps. In the first step, we randomly select one trip among the trips that are placed in the control group and randomly select one trip among the trips that are placed in the treatment group. Next, we randomly select between the trip in the control and the trip in the treatment group.

For example, imagine an individual with six total trips. In four of those trips, the youth was eligible to attend an EBP, and in two of those four eligible trips, the youth participated. This means that the youth had two trips where they were assigned to the control group (eligible but did not participate) and two trips where they were assigned to the treatment group (eligible and participated). We would randomly select between the two control group trips to get one control group trip. Then we would randomly select between the two treatment group trips to get one treatment group trip. Finally, we would randomly select between the one remaining control group trip and the one remaining treatment group trip to get a single trip for each individual.

This leaves us with an analytic dataset where there is a single intervention record for each program for each youth. We repeat the analysis several times, selecting different trips each time to ensure that our results are robust to these decisions. Ideally, we would run this thousands of times to ensure that our results are not overly weighted by one run that is different from others, but resource constraints only allowed six runs.

### *Coding Subgroups*

Our analysis included separate tests of youth outcomes following program participation for different subgroups outlined in [Exhibit 5](#). In addition to the risk level classifications and needs level classifications defined by the JCAT, we also tested subgroups based on the quartiles of youths' scores on the risk scales and needs scales. [Exhibit A3](#) identifies the scores associated with each quartile grouping for male and female youth across the risk and needs scores.

### Exhibit A3

#### Risk and Need Score Quartiles by Sex

Female youth								
Risk score quartiles	1 <sup>st</sup> quartile		2 <sup>nd</sup> quartile		3 <sup>rd</sup> quartile		4 <sup>th</sup> quartile	
Domain	Low	High	Low	High	Low	High	Low	High
1. Criminal history	0	12	13	25	26	38	39	51
2. School	-18	-8	-7	3	4	14	15	26
3. Associations	-17	-11	-10	-4	-3	3	4	10
4. Family	-22	-9	-8	4	5	17	18	31
5. Alcohol and drugs	-8	6	7	21	22	36	37	51
6. Mental health	-9	-6	-5	-2	-1	2	3	7
7. Attitudes and behavior	-11	-4	-3	3	4	11	12	19
8. Aggression	-12	-1	0	11	12	23	24	36
9. Skills	-25	-16	-15	-7	-6	3	4	13
Need score quartiles	1 <sup>st</sup> quartile		2 <sup>nd</sup> quartile		3 <sup>rd</sup> quartile		4 <sup>th</sup> quartile	
Domain	Low	High	Low	High	Low	High	Low	High
2. School	-15	-7	-6	2	3	11	12	21
3. Associations	-26	-17	-16	-7	-6	3	4	13
4. Family	-22	-8	-7	6	7	21	22	36
5. Alcohol and drugs	-4	0	1	4	5	9	10	14
6. Mental health	-3	-1	0	2	3	5	6	9
7. Attitudes and behavior	-23	-11	-10	2	3	15	16	29
8. Aggression	-9	-3	-2	4	5	11	12	19
9. Skills	-25	-16	-15	-7	-6	3	4	13
Male youth								
Risk score quartiles	1 <sup>st</sup> quartile		2 <sup>nd</sup> quartile		3 <sup>rd</sup> quartile		4 <sup>th</sup> quartile	
Domain	Low	High	Low	High	Low	High	Low	High
1. Criminal history	0	10	11	21	22	32	33	44
2. School	-21	-8	-7	6	7	20	21	34
3. Associations	-22	-13	-12	-4	-3	5	6	15
4. Family	-27	-14	-13	0	1	14	15	29
5. Alcohol and drugs	-8	0	1	9	10	18	19	27
6. Mental health	-8	-3	-2	2	3	7	8	13
7. Attitudes and behavior	-12	-4	-3	4	5	12	13	21
8. Aggression	-8	0	1	8	9	16	17	25
9. Skills	-25	-16	-15	-7	-6	3	4	13
Need score quartiles	1 <sup>st</sup> quartile		2 <sup>nd</sup> quartile		3 <sup>rd</sup> quartile		4 <sup>th</sup> quartile	
Domain	Low	High	Low	High	Low	High	Low	High
2. School	-23	-9	-8	5	6	20	21	35
3. Associations	-29	-16	-15	-2	-1	12	13	27
4. Family	-27	-9	-8	9	10	27	28	46
5. Alcohol and drugs	-7	-1	0	5	6	11	12	18
6. Mental health	-3	-1	0	2	3	5	6	8
7. Attitudes and behavior	-23	-11	-10	2	3	15	16	29
8. Aggression	-9	-3	-2	3	4	9	10	16
9. Skills	-25	-16	-15	-7	-6	3	4	13

### III. Empirical Approach

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In an ideal study of eligibility, it would need to be true that the difference in outcomes of those who participated in programs compared to those who did not is purely due to the program itself. We could then confidently conclude that having certain characteristics would lead to improved outcomes for similar individuals if they were to participate in that specific program.

Unfortunately, we cannot make this claim because individuals are not randomly assigned to participate in these programs. There are many reasons why an individual might end up in the treatment program, and those reasons are not always random. Individuals must meet the existing eligibility requirements as well as self-select into the program. If individuals who are less likely to recidivate are also more likely to participate in the program, then at least part of an estimated reduction in recidivism for the treatment group cannot be attributed to the program itself.

Therefore, we use an empirical approach to remove as many dissimilarities between treatment and control as possible. Our preferred approach does this in two separate steps: we preprocess the data using entropy balancing and then we control for other variables in a regression analysis.

We follow this process for each subsample and outcome in the data. As discussed in [Appendix II](#), we then repeat this process five additional times to ensure robustness to the randomization of multiple trips.

#### Entropy Balancing

Entropy balancing is a data preprocessing method that weights observations in the control group. When these weights are applied, covariates in the treatment and control groups will have similar distributions (i.e., the covariates are “balanced”).<sup>36</sup> For example, when assessing ART, 25% of the treatment group is 17 years old or older, while 38% of the control group is 17 or older. This difference could be concerning if age is an important predictor of program effectiveness. If we were to naively estimate a program effect without taking this into account, our estimate of the program effect would partially include the effect of age and we would end up with a biased estimated treatment effect. After conducting entropy balancing, 25% of the weighted control group is 17 years old or older and our estimate of treatment effect will not include the effect of age since the treatment and weighted control both have similar age distributions. This weighting is done in such a way that every covariate of interest is balanced simultaneously.<sup>37</sup>

We show the variables that we balance on in [Exhibit A4](#). If entropy balancing succeeds, we are guaranteed that the included covariates balance across treatment and control and differences across these variables will not bias our overall results. The entropy balancing step can fail when it is not possible to balance the requested covariates. This can happen when there is no way to weight observations to get similar distributions, as in the situation where everyone in the treatment group has a certain characteristic and everyone in the control group does not. We were unable to include all relevant factors in the entropy balancing step because the high number of control variables led to a large number of balancing failures.

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<sup>36</sup> For a full discussion of this method, see Hainmueller, J. (2012). Entropy balancing for casual effects: a multivariate reweighting method to produce balanced samples in observational studies. *Political Analysis*, 20, 25-46.

<sup>37</sup> We balance only on the mean of all covariates. However, because every control variable is a binary variable, this means that the higher moments are balanced as well.

**Exhibit A4**  
Factors Included in Entropy Balancing

Factor/variable	ART/FFT/EET/ FIT/MST	COS
Prior participation in any program except the current program: Yes/no	X	X
Prior participation in the current program: Yes/no	X	X
Eligibility in any program except the current program: Yes/no	X	X
Court categories: West urban, east urban, west rural, east rural	X	X
Assessment year	X	X
Race categories, other, White, Black, AIAN, ANHPI, Hispanic	X	X
Criminal history domain – all factors	X	X
Alcohol and drug domain – Current alcohol/drug use	X	
Mental health domain – Current mental health problem	X	

In this report, we test many different eligibility criteria. We redo this entropy balancing step on every subsample of individuals so that the covariates are balanced within each subsample.

For each subsample of individuals, we run two different entropy balancing models. The first is run on the entire sample. The second is run on the subset of those individuals who did recidivate. This second entropy balancing model is used when examining changes in the share of recidivism that is misdemeanor recidivism, felony recidivism, or violent felony recidivism.

In Exhibit A5, we present a summary of convergence rates for the entropy balancing models. There is a clear pattern of decreased success rates in the felony recidivism. Since these regressions are restricted to individuals who recidivated, this pattern is likely explained by the decrease in sample size. In addition, the programs with higher sample sizes (e.g., ART and FIT) had greater success than those with smaller samples (e.g., FFT and MST).

**Exhibit A5**

Entropy Balancing Convergence Rates Across Subgroups

<b>Female youth</b>				
<b>Program</b>	<b>Any recidivism</b>		<b>Felony recidivism</b>	
	<b>Successful subgroups</b>	<b>Success rate</b>	<b>Successful subgroups</b>	<b>Success rate</b>
ART	307	83%	267	72%
COS	57	81%	32	46%
EET	250	67%	138	37%
FFT	203	55%	240	65%
FIT	311	84%	262	70%
MST	207	56%	113	30%

  

<b>Male youth</b>				
<b>Program</b>	<b>Any recidivism</b>		<b>Felony recidivism</b>	
	<b>Successful subgroups</b>	<b>Success rate</b>	<b>Successful subgroups</b>	<b>Success rate</b>
ART	326	88%	300	81%
COS	65	93%	56	80%
EET	311	84%	119	32%
FFT	208	56%	329	88%
FIT	329	88%	329	88%
MST	298	80%	253	68%

Note:

For COS, 70 subgroups were analyzed. For other EBPs, 371 subgroups were analyzed.

As it would be impractical to include balance tables for every entropy balance model we ran, we include some summary balance measures in [Exhibit A6](#) for the entropy balancing models that did converge. Before the entropy balancing step, many coefficients are unbalanced, meaning that the distributions are unequal across treatment and control groups. However, after balancing, none of the models have unbalanced coefficients on any measure of imbalance.

### Exhibit A6

Balance of Coefficients Before and After Entropy Balancing

Measure	Pre-balancing	Post-balancing
<b>Mean % of coefficients with p &lt; 0.05*</b>		
<i>ART</i>	27.6%	0%
<i>COS</i>	31.2%	0%
<i>EET</i>	28.5%	0%
<i>FFT</i>	30.7%	0%
<i>FIT</i>	21.2%	0%
<i>MST</i>	15.7%	0%
<b>Mean % of coefficients with d &lt; 0.1*</b>		
<i>ART</i>	39.8%	0%
<i>COS</i>	52.6%	0%
<i>EET</i>	68.8%	0%
<i>FFT</i>	49.9%	0%
<i>FIT</i>	77.1%	0%
<i>MST</i>	69.0%	0%

**Note:**

\* For each coefficient of each model, we conducted a t-test of means to determine whether the mean coefficient before balancing was statistically significantly different from the mean coefficient after balancing. Then, for each model, we calculated the percent of coefficients that were statistically significant. We report here the mean percent of coefficients that are statistically significant across all models for each program. Similarly, we calculated Cohen’s d and report the mean percent of coefficients with a Cohen’s d below 0.1.

### Regression Analysis

Next, we run a regression analysis. In this stage, we can control for additional covariates that we were unable to balance in the entropy balancing stage.

We estimate the following regression equation:

$$P(Recid_i = 1) = \alpha + \beta_1 Treat_i + \gamma X_i + \delta_t + \theta_c$$

Where  $Recid_i$  is a binary variable that is one if individual  $i$  recidivated during the period of interest,  $Treat_i$  is a binary variable that is one if individual  $i$  participated in the program,  $X_i$  is a vector of individual control variables,  $\delta_t$  are year-fixed effects and  $\theta_c$  are court-fixed effects. Observations are weighted on the entropy balance weights calculated in the previous step. We present the variables included in this vector we control for in this regression step in [Exhibit A7](#).

## Exhibit A7

### Controls Included in Regression Models

Factor/variable	ART/FFT/EET/ FIT/MST	COS
Prior participation in any program except the current program: Binary (yes/no) indicator for each of the 6 EBPs.	X	X
Participation in the other EBP during the follow-up period: Binary (yes/no) indicator for 5 other EBPs (excluding current EBP).	X	X
Eligibility in any program except the current program: Binary (yes/no) indicator for 5 other EBPs.	X	X
Unique court indicators for each juvenile court.	X	X
Assessment year	X	X
Race categories, other, White, Black, AIAN, ANHPI, Hispanic	X	X
Criminal history all domain factors	X	X
School domain	All factors	2a.1, 2b.2, 2b.7, and 2b.9
Associations domain	All factors	3.12 and 3.13,
Family domain	All factors	4a.1, 4a.3, 4a.4, 4b.3, 4b.4, and 4b.10
Drug and alcohol domain	All factors	5a.1, 5a.2, 5b.1, and 5b.2
Mental health domain	All factors	6a.4
Attitudes/behavior domain	All factors	--
Aggression domain	All factors	--
Skills domain	All factors	--

**Note:**

For the domain factors, we collapsed responses when appropriate. For example, question 10 on the criminal history domain is “number of escapes” with three response options: none, one, and two or more. We created a binary variable by combining responses into two categories: none and one or more.

We estimate a linear probability model (LPM) because the dependent variable of recidivism is binary. We selected the LPM over a non-linear model such as a logistic model mainly because of the high number of control variables and the often-small sample sizes. In practice, these logit models failed to converge in a large percentage of cases—over all programs and models, less than 10% of models were successfully estimated. We use robust standard errors to account for heteroskedasticity.

In an LPM, coefficients can be interpreted as percentage point changes. For example, if the program reduced the probability of recidivism from 40% to 30%, this 10-percentage point decrease would show up as an estimated coefficient of -0.10.

For each subsample of individuals, we estimate three different outcomes. We first estimate the model where the dependent variable is a binary variable for whether the individual recidivated or not. Next, we limit the sample to those who recidivated, and then estimate whether there are changes in the proportion of recidivism that is felony recidivism and then again estimate changes in the proportion of recidivism that is violent felony recidivism. Changes in the proportion of recidivism that is misdemeanor recidivism can then be calculated from these two. For example, if the share of felony recidivism decreased by ten percentage points and the share of violent felony recidivism decreased by five percentage points, then the share of misdemeanor recidivism must have increased by 15 percentage points.

## IV. Supplemental Findings

The main report included the findings for subgroups that were found to have a reduction in at least three of the six analytic runs or that had a null effect on general recidivism and a reduction in felony recidivism in at least three of the six analytic runs. For many subgroups, we consistently identified no effect of program participation. In other instances, we were unable to examine program effectiveness due to limited sample sizes within a subgroup. This appendix provides more information about the overall subgroup findings, by program.

As before, we do not report every estimate of every regression table due to space, but we do report some summary output for the general recidivism models in [Exhibit A8](#). Models identified as iatrogenic are those in which we found an increase in recidivism following program participation in at least three of our six analytic runs. Models identified as null are those in which three or more analytic runs found no effect on recidivism following program participation and there were not three models with a therapeutic or iatrogenic effect (e.g., if three models were null, two were iatrogenic, and one was therapeutic, we classified it as null). Models identified as null (weak) are those for which we were unlikely to identify a significant effect due to limited statistical power resulting from small sample sizes. Models identified as non-convergent include those for which three or more analytic runs did not converge and there were not three models with a therapeutic or iatrogenic effect (e.g., if three models failed to converge, two were iatrogenic, and one was therapeutic, we classified it as nonconvergent). Finally, we classify all other models as inconclusive. The inconclusive category includes models for which there were no consistent patterns across the findings of the six analytic runs. Full results for each of the 371 subgroups by sex and program are available upon request.

### Exhibit A8

Summary of Model Findings for General Recidivism by Program and Sex

	ART	EET	FFT	FIT	MST
<b>Male youth</b>					
Therapeutic	1	6	1	0	6
Iatrogenic	124	183	188	95	125
Null	3	60	21	29	72
Null (weak)	190	48	110	13	62
Non-convergent	53	72	49	219	101
Inconclusive	0	2	2	15	5
<b>Female youth</b>					
Therapeutic	6	13	0	0	5
Iatrogenic	6	48	41	5	19
Null	14	70	16	54	58
Null (weak)	272	91	243	26	51
Non-convergent	73	141	70	273	236
Inconclusive	0	8	1	13	2

For male youth, the results for general recidivism were most often iatrogenic or null (weak). For female youth, the results were most often null (weak) or non-convergent. Overall, these findings are unsurprising since there were far fewer female youth who were eligible for or who participated in any program, so we were less likely to have enough statistical power to identify significant effects and in many cases could not consistently get convergence in our analysis.

For both male and female youth, there were more subgroups with consistently iatrogenic findings than consistently therapeutic findings. Examining characteristics associated with iatrogenic effects may also help the CJAA committees identify potential responsivity barriers to treatment programs.

The overwhelmingly large number of models that were null or null (weak) suggests that a strictly empirical eligibility strategy is likely not possible because of limited sample sizes. The CJAA committees will likely need to consider theoretical justifications for the development of particular eligibility criteria. If the findings for a subgroup were identified as null, it is still possible that participation in the program would have beneficial effects on other youth outcomes such as family stability, educational attainment, or the development of prosocial bonds. Consequently, null findings may not be a reason to preclude certain youth from accessing certain forms of treatment.

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