MISSION: To protect the public and reduce crime by holding youth offenders accountable and providing opportunities for reformation in safe environments.

OYA Recidivism Risk Assessment – Violent Crime (ORRA-V)

Modeling Risk to Recidivate with a Violent Crime

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Abstract

The objective of this study was to identify the factors most closely associated with violent felony recidivism and to quantify the relationship of those factors into an equation that would accurately predict a youth's risk to recidivate with a violent or threatening crime. The study relied on data and analytical techniques employed in the development of the OYA Recidivism Risk Assessment (ORRA), which predicted recidivism more broadly. The model resulting from the current effort is the OYA Recidivism Risk Assessment – Violent Crime (ORRA-V). The ORRA-V assesses the risk of violent recidivism of youth placed on county probation in Oregon, youth committed to OYA probation supervision, and youth released to the community from OYA close custody facilities. The final model included 9 independent predictors of violent recidivism and performed moderately well (AUC = .724) in predicting whether a youth would recidivate with a violent crime within 36 months. The variables that demonstrated the strongest relationship to violent recidivism were male, prior weapon offense referral, total prior misdemeanor referrals, total prior felony referrals, and total prior runaway referrals. ORRA-V scores will assist the agency in identifying which youth pose the greatest risk to public safety. Such knowledge will help in making decisions about youth supervision and treatment, in matching youth with appropriate interventions, and in determining a youth's readiness for release from OYA close custody.

Overview

> *The mission of the Oregon Youth Authority is to protect the public and reduce crime by holding youth offenders accountable and providing opportunities for reformation in safe environments.*

The Oregon Youth Authority (OYA) operates secure close custody facilities around the state for youth offenders who cannot live safely in the community. In addition, the agency oversees out-of-home placements in residential facilities and foster care homes for juveniles committed to OYA probation or released on parole. Recidivism—relapsing into criminal behavior—is the key measure of the extent to which OYA services have been able to protect the public.

Whereas any new crime is unacceptable, reducing violent crimes is among the agency's very highest priorities. Hence, in this study, the goal was to build a model that would predict a youth's likelihood of recidivating with a violent crime in 36 months. Consequently, the definition of recidivism was narrowed to include only violent and threatening crimes that resulted in—or could result in—physical harm. In particular, the outcome measure was a new adjudication or conviction for a violent felony within 36 months of placement on county probation, commitment to OYA probation, or release from OYA close custody. Examples of crimes meeting the definition included assault, rape, and robbery. Find the complete list of violent offenses in Appendix A.

The stage for this work was set in a prior successful effort between researchers at OYA and the Oregon Department of Corrections (DOC). That collaboration yielded the OYA Recidivism Risk Assessment (ORRA), which predicts felony recidivism under a broader definition: any felony adjudication or conviction within 36 months of the date a youth starts probation or is released from OYA close custody. Development of the OYA Recidivism Risk Assessment-Violent Crime (ORRA-V) model—the risk equation resulting from this study—directly leveraged much of the work performed in the ORRA study, including the dataset and analytical methods.

The ORRA-V model relies on data collected as part of current standard practice on all youth with a record in Oregon's statewide Juvenile Justice Information System (JJIS). In addition to providing a rich set of demographic and criminal history variables for model development, the data are readily accessible to JJIS developers, who can program the system to automatically generate a violent recidivism risk score (ORRA-V score) for youth in any of the following population groups:

- Juveniles placed on county probation
- Juveniles committed to OYA probation
- Juveniles released from OYA close custody
- DOC youth released to post-prison supervision (PPS) from OYA close custody

ORRA-V will join ORRA, the OYA Risk/Needs Pre-Screen assessment (RNA) and the Juvenile Crime Prevention risk assessment (JCP) as one of the key risk assessment tools available to juvenile justice agencies in Oregon. Unlike the JCP and RNA risk measures—which classify youth as low, moderate, or high risk of recidivating—the ORRA and ORRA-V equations

produce a numeric score between 0 and 100. A result near zero indicates the youth is very unlikely to recidivate with a felony (ORRA) or violent felony (ORRA-V) within 36 months, whereas a number near 100 identifies the youth as highly likely to recidivate.

ORRA-V scores can assist the agency in making decisions about suitable out-of-home placements for probation and parole youth, in matching youth with appropriate interventions, and in determining a youth's readiness for release from OYA close custody. In this way, the agency minimizes current and future public risk by reserving the most intensive—and typically most costly—supervision and treatment for youth assessed as most likely to recidivate violently.

Purpose

The agency's commitment to reducing juvenile crime and further victimization overarches every decision about a youth's level of supervision, placement, reformation plan, and transition services. The goal of this study was to create a functional model for assessing a youth's risk to recidivate with a violent felony. Such a model can play an important role not only in making supervision and treatment decisions for individual youth but also in helping the agency ensure appropriate program offerings are available through its facilities and contract providers.

Methodology

Subjects

To develop the ORRA-V, analysts started with the same dataset employed in creating the final ORRA model. The paper "OYA Recidivism Risk Assessment: Modeling Risk to Recidivate" (OYA, 2010) detailed the process for deriving the analysis dataset from an original data extract of 28,431 records.

The data for this study comprised 9,257 disposition records representing 9,257 unique youth who met at least one of the following event criteria between January 1, 2005 and May 14, 2007:

Placement on county probation. The disposition date was the same as the qualifying event date (placement).

Commitment to OYA probation. The disposition date was the same as the qualifying event date (commitment).

Release from an OYA close custody facility. Most of these youth received a period of OYA parole supervision, but some were released with no further supervision due to an expired or terminated commitment. The disposition committing the youth to OYA close custody occurred prior to the qualifying event (release).

Release from OYA close custody to post-prison supervision in the adult system. These youth were convicted as adults but placed in the physical custody of OYA at a youth correctional facility. The youth's admission to OYA close custody occurred prior to the qualifying event (release).

Records provided data on youth demographics, disposition detail for the current record, and numerous criminal history variables.

Outcome Variable

To create a functional risk model required a consistent and unambiguous definition of the outcome measure—violent recidivism. This was accomplished by clearly specifying these four components: (a) group of people to track, (b) date to start tracking, (c) length of time to track, and (d) violent recidivism event. This study specified the four components as follows:

Group of people to track. The potential predictors of recidivism were examined on four key populations:

- *County probation:* youth offenders who were placed on probation under the supervision of the county juvenile department.
- *OYA probation:* youth offenders who were committed to OYA probation and placed in the legal and physical custody of OYA for a period of out-of-home care and supervision.
- *Juveniles released from OYA close custody:* juvenile offenders who were released to the community from OYA close custody. Nearly all of these youth experienced a period of parole supervision, but a few cases each year may be terminated, typically due to an expired commitment or aging out of the system. (OYA supervision is limited to youth under age 25.)
- *DOC youth released from OYA close custody:* youth offenders who were convicted as adults and then later released to post-prison supervision from OYA close custody. In the legal custody of DOC, these youth were placed in the physical custody of OYA at a youth correctional facility. (Note: OYA does not track recidivism of DOC youth who are returned to the physical custody of DOC and released from DOC close custody at a later date.)

Date to start tracking. The date to start tracking recidivism differed for each of the key populations:

- *County probation:* date each youth was placed on county probation.
- *OYA probation:* date each youth was committed to OYA probation.
- *Juveniles released from OYA close custody:* date each youth was released to the community from OYA close custody.
- *DOC youth released from OYA close custody:* date each youth was released to DOC post-prison supervision from OYA close custody.

Length of time to track. This study tracked each youth for 36 months from the start-tracking date.

Recidivism event. The recidivism event was any felony adjudication (juvenile court) or felony conviction (adult court) with a disposition of formal supervision (e.g., probation, OYA commitment, DOC prison sentence, or local control jail sentence) for a violent or threatening crime. For the purposes of this study, a felony conviction for committing, conspiring, attempting, or soliciting another person to commit any of the offenses listed in Table 1 was considered a qualifying violent crime. Find a detailed list of the violent offenses in Appendix A.

The 36-month violent recidivism rate for the entire study population was 10.88%. Table 2 shows the violent recidivism rates for each of the key population groups.

Table 2: Violent recidivism rates by population

POPULATION GROUP	N	RECIDIVISM RATE
County probation	7,517	9.54%
OYA probation	565	14.34%
Juveniles released from OYA close custody	1,001	18.68%
DOC youth released from OYA close custody	174	12.64%
Entire study population	9,257	10.88%

Table 1: Recidivism by qualified violent offense

OFFENSE DESCRIPTION	N
Aggravated Animal Abuse	0
Arson	9
Assault	329
Burglary, Theft by Extortion	283
Child Neglect	1
Coercion	17
Compelling Prostitution	0
Criminal Mistreatment	7
Custodial Interference	1
Custodial Sexual Misconduct	0
Incest	2
Intimidation	2
Kidnapping	11
Murder, Homicide, Manslaughter	19
Possession of Child Sex Material	0
Rape, Sodomy, Sexual Penetration, Sexual Abuse	146
Riot	3
Robbery	169
Treason	0
Unlawful Possession of Firearms / Silencer, Unlawful Manufacture / Sale / Possession of Firearms	4
Using Child in Display of Sexually Explicit Conduct, Encouraging Child Sex Abuse	4

Independent Variables

Development of the ORRA-V relied on the same set of predictor variables as the ORRA. Youth disposition records extracted from JJIS included basic demographic information, age at first delinquency, details of the disposition related to the current record, and numerous summary fields describing the youth's disposition history. A list of the entire set of potential predictor variables is available in Appendix B.

Variables related to the current disposition included information about the disposition date, disposition intensity, and crime detail.

Variables related to the youth's history summarized delinquent activity occurring prior to the disposition date of the current record. While not necessarily intuitive, referral[1] data associated with the current disposition record were included in the summary variables. This

[1] A referral is an allegation or group of allegations received by a juvenile department at any one time. Referrals are documented by a police report or other formal means of referral. A referral in the juvenile system is similar to an arrest or citation in the adult system.

was appropriate because a youth must have been referred before the court entered a disposition on the referral.

Building the Model

The process for building the ORRA-V equation was nearly identical to the process employed in creating the ORRA model. The key analytical techniques used in deriving the recidivism risk equation included bootstrap resampling[2], logistic regressions, and metrics for concordance rate and area under the curve (or the receiver operating characteristic). SAS statistical software provided the analytical engine.

There were four main phases in the model building process: Phase I—initial selection and definition of variables; Phase II—screening variables; Phase III—creating the model; and Phase IV—refining the model.

Phase I—initial selection and definition of variables. Because the dataset for ORRA-V development was the same as that used in the ORRA, this first phase was able to heavily leverage that prior work. For example, the same variables that had been found to occur too infrequently to warrant further analysis for ORRA were automatically excluded from the ORRA-V analysis. However, because the outcome variable was different for ORRA-V (violent felony) than for ORRA (any felony), the composite variables created for ORRA were not employed in ORRA-V.

Phase II—screening variables. In Phase II, the bootstrap resampling technique was used to identify those variables most likely to predict violent recidivism. One thousand random samples were drawn from the dataset, and a stepwise logistic regression was performed on each of the samples. The logistic regression analyses showed which of the variables forwarded from Phase I had statistically significant relationships with violent recidivism. Compiling results from the 1,000 logistic regression simulations, the predictor variables were tabulated and ranked to determine which ones emerged consistently as predictors of violent recidivism.

Phase III—creating the model. Construction of the ORRA-V model began with the top 10 predictor variables—those that were significant in at least 23% of the 1,000 simulations conducted in Phase II. At analyst discretion, two more variables—age at first delinquency and crime severity—were also included. Each of these predictor variables was entered into a logistic regression equation and examined to determine its unique effect on recidivism (i.e., the effect of the individual variable after controlling for the effect of all other predictor variables). Those predictor variables with a statistically significant effect on recidivism that also increased the concordance rate[3] were retained in the model.

[2] A bootstrap resampling procedure takes repeated random samples from the dataset with replacement, meaning that records drawn in one sample are replaced in the dataset before the next sample is drawn. Hence, individual records may be redrawn in subsequent random samples.

[3] The concordance rate is one measure of a model's predictive accuracy. It indicates the presence of a given trait in both members of a pair of twins. So, in the case of the ORRA-V model, the concordance rate is the percentage of cases where youth with similar ORRA-V scores had the same recidivism outcome.

Phase IV—refining the model. The equation from Phase III was further examined for dependencies among the predictor variables. After considering all two-way interactions[4] between predictor variables, the final model was honed to 12 terms comprising 9 independent predictor variables, 2 interaction terms, and a constant. The refined equation predicting 36-month violent recidivism for the full dataset population attained a .72 concordance rate.

The refined risk assessment equation resulting from Phase IV is the OYA Recidivism Risk Assessment-Violent Crime (ORRA-V). The ORRA-V model predicts the likelihood of violent recidivism outcomes for Oregon youth in the study population, which includes county probation, OYA probation, and juveniles and DOC youth released to the community from OYA close custody. The recidivism event is a violent felony conviction or adjudication within 36 months of the youth's start-tracking date.

Results

Model accuracy

Area under the curve (AUC) metrics were calculated to measure how well the ORRA-V correctly classified those who did and did not recidivate[5]. On a random sample of 4,596 cases with known outcomes, the final risk equation achieved AUC = .724. An AUC = .50 suggests an equation's predictive accuracy is poor, while an AUC = 1.0 suggests the equation can predict perfectly in every case. Therefore, the AUC score on the ORRA-V model indicated that the instrument performed moderately well (Tape, n.d.).

Tests for group differences found that the model predicted better for some subpopulations than for others (Table 3). Generally speaking, larger subpopulations attained AUC metrics closer to the overall dataset. This outcome is expected because these groups would have had the heaviest representation in the analysis dataset. Of particular interest are the AUC scores by population group. Figure 1 shows that the distribution of ORRA-V scores by population group follow a similar pattern, but from Table 3 it appears that the ORRA-V model is doing only a marginal job of correctly predicting the violent recidivism risk of DOC youth released from OYA close custody (AUC = .625). The AUC scores for subpopulations within other divisions of the dataset were all above .65.

[4] An interaction term is a composite of two or more predictor variables whose effect on the outcome will vary depending on the level of the other variables in the term. The interaction term adjusts the outcome for these dependencies. In other words, if one individual possesses two traits or characteristics included in the interaction term, predicted risk will increase or decrease if the interaction term is significant.

[5] The AUC metric indicates the probability that a randomly selected youth from a group that recidivated with a violent crime will have a higher risk score than a randomly selected youth from a group that did not recidivate.

Figure 1: Distribution of ORRA-V scores by population group

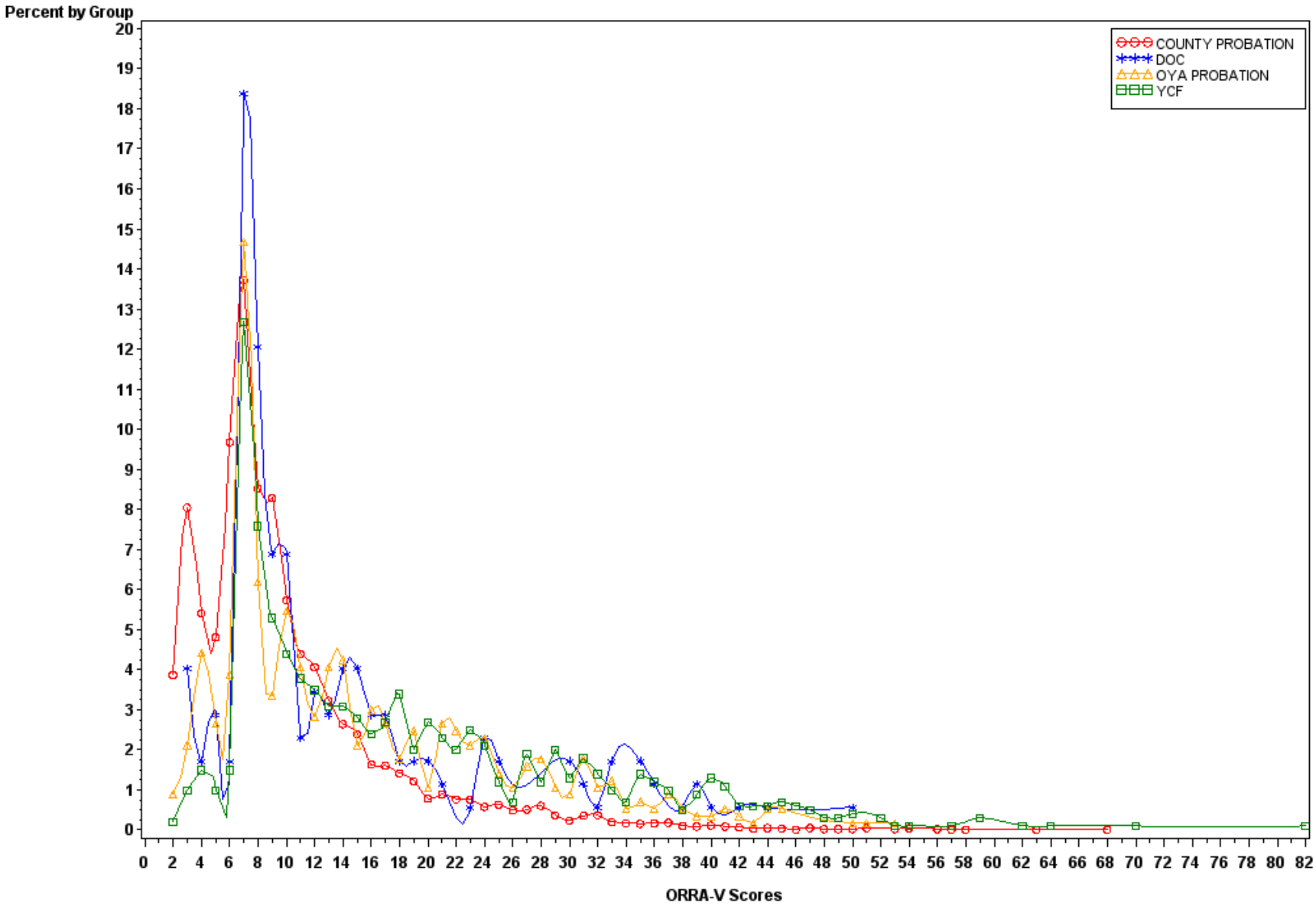

Table 3: ORRA-V model accuracy by subpopulation

GROUP VARIABLE SUBPOPULATION	N	AUC	EXPECTED RECIDIVISM (MODEL)	ACTUAL RECIDIVISM
POPULATION GROUP				
County probation	7,517	.714	9.56%	9.54%
OYA probation	565	.689	14.83%	14.34%
Juveniles released from OYA close custody	1,001	.719	18.13%	18.68%
DOC youth released from OYA close custody	174	.625	13.26%	12.64%
SEX				
Female	2,137	.663	4.45%	4.45%
Male	9,257	.703	12.81%	12.81%
RACE/ETHNICITY				
African American	514	.726	15.41%	22.57%
Asian	124	.677	11.14%	15.32%
Hispanic	1,540	.674	12.04%	14.29%
Native American	340	.676	10.71%	11.76%
White	6,397	.726	7.34%	5.56%
Other/Unreported	342	.743	10.43%	9.27%
CURRENT DISPOSITION: SEX OFFENSE*				
Not Sex Offense	8,414	.726	11.03%	11.18%
Sex Offense	831	.679	9.36%	7.70%
* Excludes 12 cases with missing values				
COHORT YEAR				
2005	3,993	.726	11.45%	12.82%
2006	3,550	.714	10.69%	9.83%
2007	1,714	.730	9.93%	8.52%

Predictors of recidivism

The analysis identified 9 independent predictors of violent recidivism. In addition, the final ORRA-V equation included 2 interaction variables and the intercept term. Refer to Table 4 for a complete list of the final equation components.

Predictor variables retained in the final equation were all static risk factors that could be described by one or more of the following: demographic (e.g., male), crime severity (e.g., felony or misdemeanor), type of crime/delinquency (e.g., curfew violation, running away from home), or frequency of occurrence. Five of the final equation variables were found to

have a highly significant relationship ($p < .0001$)[6] with a youth's risk of violent recidivism: male, prior weapon offense referral, total prior misdemeanor referrals, total prior felony referrals, and total prior runaway referrals.

All of the independent predictor variables were positively associated with risk, meaning that the presence of these attributes increased the likelihood that a youth in the study sample had recidivated with a violent crime. The two interaction terms were negatively correlated with risk to recidivate.

Table 4: ORRA-V model detail

PREDICTOR VARIABLES	VALUES	PARAMETER ESTIMATE (β)	ODDS RATIO	SIGNIFICANCE LEVEL
Intercept	Constant	-4.0386	N/A	<.0001
Male	Female = 0, Male = 1	1.0227	2.781	<.0001
Prior weapon offense referral*	No = 0, Yes = 1	0.4825	1.620	<.0001
Total prior misdemeanor referrals*	Sum (maximum = 20)	0.1263	1.135	<.0001
Total prior felony referrals*	Sum (maximum = 6)	0.2725	1.313	<.0001
Prior felony assault referral*	No = 0, Yes = 1	0.2781	1.321	0.0122
Prior felony theft referral*	No = 0, Yes = 1	0.3083	1.361	0.0017
Prior misdemeanor theft referral*	No = 0, Yes = 1	0.1833	1.201	0.0240
Prior curfew violation referral*	No = 0, Yes = 1	0.1996	1.221	0.0256
Total prior runaway referrals*	Sum (maximum = 20)	0.0828	1.086	<.0001
Interaction: prior weapon offense referral & prior felony theft referral	Product of the two variable terms specified	-0.6022	0.548	0.0023
Interaction: total prior misdemeanor referrals & total prior felony referrals	Product of the two variable terms specified	-0.0190	0.981	0.0001
* Variables that refer to prior history reflect activity prior to the disposition date on the current disposition record.				

Understanding odds ratios

Each parameter estimate in Table 4 is the unconverted coefficient for the associated predictor variable in the logistic regression equation that represents the final ORRA-V model. Substituting the parameter estimate for x in the exponential function (e^x) converts it into an odds ratio, which is simpler to interpret. An odds ratio of 1.0 would mean that—all else being equal—a difference in the value of the predictor variable would have no impact on a youth's likelihood of recidivating with a violent crime. The more a variable's odds ratio differs from 1.0, the more each increment in the variable's value has the potential to influence the ORRA-V score.

[6] A result is considered statistically significant if it is unlikely to have occurred by chance. The $p < .0001$ level of statistical significance means there is less than once chance in 10,000 that the result happened by coincidence.

Following are some examples based on the odds ratios of a few of the predictor variables listed in Table 4:

1. *Predictor variable is binary: Male (yes = 1/no = 0).* The odds ratio associated with being male is 2.781. So, if two youth are identical in every way except sex, then the odds that the male will recidivate with a violent crime are 2.781 times that of the female.
2. *Predictor variable takes a range: Prior felony referrals (sum of priors, maximum = 6)*. The odds ratio associated with this variable is 1.313. Hence, all else being equal, the odds that a youth with one prior felony referral will recidivate with a violent crime are 1.313 times greater than a youth with no prior felonies. Table 5 shows how each additional prior felony referral affects the odds that a youth will recidivate compared to a youth with no prior felony referrals. More than six prior felonies will not increase the odds of recidivating because of the maximum value established for this variable.

Table 5: Effect of prior felony referrals on odds of violent recidivism for youth otherwise identical

PRIOR FELONY REFERRALS	ODDS COMPARED TO NO PRIORS	CALCULATION/ COMMENT
1	1.313	$1.313^1 = 1.313$
2	1.724	$1.313^2 = 1.724$
3	2.264	$1.313^3 = 2.264$
4	2.972	$1.313^4 = 2.972$
5	3.902	$1.313^5 = 3.092$
6	5.124	$1.313^6 = 5.124$
7	5.124	More than 6 priors will not add to predicted risk.

3. *Variables with small odds ratios that accept a range of values may have a substantial impact on predicted risk.* Consider the odds ratios associated with being male (2.781) and prior felony referrals (1.313). Even though the odds ratio associated with prior felony referrals is smaller, Table 5 shows that accumulating five such referrals increases the odds of recidivating almost fourfold. So, all else being equal, a female with five felony referrals would have a higher risk of violent recidivism than a male with no prior felony referrals (odds for five prior felony referrals = 3.902 vs. odds for males = 2.781).

Interpreting ORRA-V scores

The component terms of the ORRA-V equation are individually interesting. They are the variables and interactions found to have a significant influence on violent recidivism in the target population. However, it is the equation result—the ORRA-V score—that provides the overall assessment of a youth's risk of violent recidivism.

The final ORRA-V model is represented mathematically as a logistic regression equation. Logistic regressions always result in a decimal number between 0 and 1. The ORRA-V score is that decimal scaled to a whole number between 0 and 100[7]. The score represents the likelihood that a youth will recidivate with a violent crime. An ORRA-V score near zero means a youth is assessed as having a low risk of violent recidivism, while a score near 100 indicates a high likelihood of violent recidivism.

[7] More specifically, multiplying the result from the ORRA-V logistic regression equation by 100 and rounding that answer the nearest integer yields the ORRA-V score.

As an example, a youth with an ORRA-V score of 15 has been assessed as having a 15% probability of recidivating with a violent crime. It is important to think about what this figure means in context. Based on the values of the component variables in the ORRA-V equation, 15 out of 100 youth with these risk factors are predicted to recidivate with a violent crime within 36 months. By extension, a youth with an ORRA-V score of 10 has a lower probability of violent recidivism, and a youth with a score of 25 has a higher probability.

Keep in mind that the ORRA-V score represents risk, not certainty. The outcome variable—violent recidivism—is dichotomous: either the youth recidivates with a violent crime or the youth does not. There is no such thing a partial recidivism. Even an ORRA-V score of 60 does not mean the youth will definitely recidivate. While 60 of 100 youth with a score of 60 would be expected to recidivate, 40 of 100 youth with this score would not be expected to recidivate.

Discussion

Summary of key findings

A reliable, accurate model that predicts the likelihood that a youth will recidivate with a violent crime is an important and practical tool for OYA. Results from the ORRA-V can assist in individual youth case planning and placement decisions. In addition, in the aggregate, ORRA-V scores will help the agency gauge the overall need for interventions that target factors related to violent offending.

Predictor variables. All of the variables identified as significant predictors of violent recidivism had a positive influence on the outcome. In other words, the presence of each of the characteristics increased the youth's risk of recidivating with a violent crime.

In general, predictor variables tend to be similar among recidivism risk assessments. Where the assessments tend to differ is in the weighting of the variables. So, it is no surprise that factors analogous to four of the criminal history variables in the ORRA-V—prior misdemeanor referrals, prior felony referrals, prior felony assault referral, and prior weapon offense referral—are common to many risk instruments, including the Washington State Juvenile Court Assessment (Barnoski, 2004) and assessments adapted from the WSJCA, such as the agency's own RNA and Florida's Positive Achievement Change Tool (Baglivio, 2009). In addition, two of the non-criminal independent variables in ORRA-V—male and prior runaway referrals—have also been identified as predictors in WSJCA-based recidivism risk instruments. The ORRA-V's prior curfew violation referral, prior felony theft referral, and prior misdemeanor theft referral variables do not appear in the WSJCA or its derivatives. However, OYA analysts conjecture that curfew violations may function as a proxy for a lack of parental authority and control, which is one of the WSJCA factors. The two theft variables are likely in the model because the list of violent and threatening crimes in the ORRA-V outcome measure includes Burglary 1, Theft by Extortion, and Robbery 1-3. These felony crimes were included because their definitions included either the threat or attempt of physical harm or a weapon (State of Oregon, 2010). Notable for its exclusion from the model is an age-related variable.

Predictive accuracy. The area under the curve statistic (AUC=.724) for the overall ORRA-V model suggests the model has moderate predictive accuracy. A number of studies have examined juvenile risk assessments predicting general recidivism (i.e., not limited to violent or threatening crimes) using AUC as the effect size measure (e.g., Bechtel, Lowenkamp, & Latessa, 2007; Jung & Rawana, 1999; OYA, 2011; Schwalbe, Fraser, & Day, 2007). In a meta-analysis of 28 juvenile risk assessment studies, Schwalbe (2007) reported AUCs between .532 and .780 across all studies, with a weighted average effect size of AUC = .640, *SD* = .042.

The relatively high AUC statistic of the ORRA-V may reflect (a) reliable independent variables (e.g., variables based on quantitative data versus subjective assessment), (b) the use of actual weights rather than approximated weights common in pencil-and-paper types of assessments, and (c) the inclusion of statistical interactions. These interaction terms imply that combinations of factors are important when assessing the risk of violent recidivism.

AUC metrics indicated that the ORRA-V was less predictive for certain subpopulations (Table 3). For small sample sizes, Hanczar et al. (2010) urged extreme caution in relying on the diagnostic accuracy of AUC statistics, but the authors provided no specific guidance on the necessary sample-size threshold for obtaining precision in AUC metrics. So, the relatively low AUC score (.625) calculated on the small DOC youth population (N = 174) may not be an accurate reflection of how well the ORRA-V will perform for that group. Similarly, the somewhat better AUC score (.677) calculated on the small Asian subpopulation (N = 124) may not mean that ORRA-V is more accurate with Asians than with other groups having lower AUC scores. That being said, it seems reasonable to believe that ORRA-V performs moderately well for the other subpopulations examined, which all benefit from sample sizes of at least 300 observations.

Table 6: Significance levels of predictor variables in ORRA-V and ORRA recidivism risk models

PREDICTOR VARIABLES	ORRA-V	ORRA
Male	<.0001	<.0001
Prior weapon offense referral	<.0001	0.0203
Total prior misdemeanor referrals	<.0001	<.0001
Total prior runaway referrals	<.0001	<.0001
Total prior felony referrals	<.0001	<.0001
Prior felony assault referral	0.0122	N/A
Prior felony theft referral	0.0017	N/A
Prior misdemeanor theft referral	0.0240	N/A
Prior curfew violation referral	0.0256	N/A
Prior felony drug or alcohol referral	N/A	0.0141
Age at start tracking	N/A	0.0136
Prior criminal mischief referral	N/A	<.0001
Total prior theft referrals	N/A	0.0971
Prior delinquency adjudication	N/A	0.0037
Total prior drug or alcohol referrals	N/A	0.0002
Current sex offense disposition	N/A	<.0001

Where there are adequate numbers, we see some interesting results (Table 3). Despite the model accurately estimating the likelihood of recidivism for most youth, some subpopulations deviated from their expected recidivism. In particular, the model tends to

underestimate risk of African Americans and tends to overestimate risk of sex offenders. Another interesting byproduct of this analysis reveals a decline between the 2005 and 2007 cohort years in both actual recidivism (from 12.82% to 8.52%) and expected recidivism (from 11.45% to 9.93%).

Relationship with ORRA. Both ORRA-V and ORRA share many of the same predictor variables (Table 6). While their outcomes are different, development of both models rested on the same dataset; and the correlation[8] between ORRA-V and ORRA scores is high and statistically significant (r = .897, p < .01). The strength of the association between the risk scores generated by the assessments is explained by their similarity. The two models share five predictor variables, and four of those were found to have high statistical significance (p <.0001) in both ORRA-V and ORRA: male, total prior misdemeanor referrals, prior felony referrals, and total prior runaway referrals. A prior delinquency adjudication is not a predictor in ORRA-V; however, the prior referral variables (weapon, misdemeanor, felony assault, theft) in ORRA-V certainly suggest delinquency. Furthermore, while they do not employ the identical variables, both models include factors related to theft. Notable differences between the two models are the exclusions of variables related to sex offense, drug or alcohol, criminal mischief, and age in ORRA-V. None of these factors was found to have a statistically significant relationship with violent recidivism.

Strengths and Limitations

Because both studies relied upon the same dataset, the strengths and limitations of the ORRA-V study are essentially the same as those identified for the ORRA study.

Dataset and methodology. This project benefitted from a dataset that included numerous potential explanatory variables and from the use of bootstrap resampling techniques that capitalized on the large number of available records—9,257 commitments in the final cleansed dataset for the 36-month tracking period. Furthermore, analysts were able to construct the ORRA-V model from objective variables that had been collected for a number of years through the course of standard business practices. The advantage of this methodology and a sound dataset was the ability to create a parsimonious model incorporating covariates that had demonstrated a significant relationship with recidivism.

Another clear benefit to the study was the availability of longitudinal recidivism data for the youth population. However, there were some limitations regarding the currency of available data on youth whose supervision had been terminated. In particular, data were not available to update records of terminated youth with felonies convicted outside of the Oregon judicial system (e.g., convictions in another state or the federal system) or to flag the records for censoring in the case of death.

Static risk factors. A potential limitation of the ORRA-V model is its reliance on static risk factors—sex, criminal history, and delinquency history variables—known at the time of the

[8] The strength of a linear relationship between two variables can be expressed with the Pearson correlation coefficient r, a computed value between -1 and 1. The closer r is to 1 or -1, the stronger the linear relationship is between the variables. As r approaches zero, there less of a relationship. If $r > 0$, this indicates a positive correlation, meaning increasing values of one variable are generally accompanied by increasing values in the other. When $r < 0$, the variables display negative correlation.

youth's disposition (e.g., commitment to probation or to OYA close custody). Variables such as attitude, peer associations, family problems, and substance dependency are considered dynamic factors and are frequently targeted for change with interventions post-disposition. In addition to the agency's RNA instrument, many of the risk assessments in use today—e.g., WSJCA (Barnoski, 2004), PACT (Baglivio, 2009) and Youth Level of Service Inventory/Case Management Inventory (Bechtel, Lowenkamp, & Latessa, 2007)—depend on some combination of both static and dynamic factors.

While the ORRA-V equation does not account specifically for dynamic factors, these effects have been indirectly incorporated into the model because the opportunity for change in the dynamic variables was available to youth in the sample used in constructing and validating the tool. However, the relationship between those independent static variables and violent recidivism may change over time. It is, after all, the business of this agency to reform youth so that they can go on to lead productive, crime-free lives. To the degree that the agency—or any partner in the youth's reformation—is consistently able to improve its targeting and delivery of treatment services, the influence of certain static risk factors may be mitigated in the face of change in dynamic variables, which are not quantified in the model.

Fixed tracking period. Another limitation of the ORRA-V model is that it makes no adjustment to the tracking period to compensate for days lost to revocation, detention, or re-incarceration in an adult system facility. Consequently, some youth may be under intensive supervision—with little opportunity to recidivate—during the recidivism tracking period. To quantify one example, of the 377 youth released to OYA parole supervision in fiscal year 2008 (July 1, 2007 to June 30, 2008), 120 were revoked to OYA close custody within 12 months.

Application of ORRA-V scores

Placement and treatment decisions. While the agency has little direct influence over how many youth are committed to its custody, OYA does determine the specific close custody or residential placements for those youth. To protect the public, OYA places youth at higher risk of recidivating under higher levels of supervision. However, capacity in the system is not unlimited. Hence, the agency can consider ORRA-V scores along with ORRA scores to determine which youth pose the greatest public safety risk.

The agency can also use ORRA-V scores to assist in determining the best placement for a youth. Youth at higher risk of violent recidivism may require not only a higher level of supervision but also a more intensive treatment program and longer dosage. Youth at lower risk may benefit from the provision of treatment programs in less restrictive—typically less costly—settings. This aligns well with OYA's current practice of placing adjudicated juveniles in the least restrictive environment possible in which they can achieve their treatment goals (OYA, 2009). Studies have shown that interventions have greater effects on higher risk youth. For example, Lipsey and Wilson's (1998) meta-analysis found that the typical intervention in the studies they analyzed "was *more* effective with serious offenders than with less serious offenders." ORRA-V scores can help the agency focus additional resources on those youth who need more treatment.

Parole decisions. OYA has paroling authority for adjudicated juveniles committed to a youth correctional facility. Taken together with other available information about a youth—e.g., completion of treatment, school progress, behavior in the facility—ORRA-V results can help gauge a youth's readiness for transition back into a community setting.

Sentencing practices. Making information about a youth's risk for violent recidivism available to the judge, district attorney, youth's lawyer, and family may make it possible to improve youth outcomes and conserve expensive resources without compromising public safety.

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Appendix A

Violent crimes with detail from Oregon Revised Statutes (ORS)

The ORRA-V model predicts the likelihood that a youth will recidivate with a violent crime listed in this appendix.

In particular, commitment of or conspiracy to commit any of the offenses in this list was considered a violent crime. An attempt or solicitation to commit an offense in this list designated as Treason, Murder, Class A felony, or Class B felony was also considered a violent crime. In Oregon Criminal Code, the ORS type/classification of a felony offense is lowered when the conviction is for an attempt or solicitation of the offense. As a result, a conviction for an attempt or solicitation of a Class C felony offense becomes a Class A misdemeanor, which was not considered a qualified violent crime due to its loss of felony status.

DESCRIPTION	ORS NUMBER	ORS TYPE/CLASS
Criminal Homicide	163005	Murder
Aggravated Murder	163095	Murder
Murder	163115	Murder
Manslaughter-1	163118	Felony A
Manslaughter-2	163125	Felony B
Criminally Negligent Homicide	163145	Felony B
Assault-1	163185	Felony A
Assault-2	163175	Felony B
Assault-3	163165	Felony C
Assault-4	163160.3	Felony C
Criminal Mistreatment-1	163205	Felony C
Assaulting Public Safety Officer	163208	Felony C
Kidnapping-1	163235	Felony A
Kidnapping-2	163225	Felony B
Custodial Interference-1	163257	Felony B
Custodial Interference-2	163245	Felony C
Coercion	163275	Felony C
Rape-1	163375	Felony A
Rape-2	163365	Felony B
Rape-3	163355	Felony C
Sodomy-1	163405	Felony A
Sodomy-2	163395	Felony B

DESCRIPTION	ORS NUMBER	ORS TYPE/CLASS
Sodomy-3	163385	Felony C
Sexual Penetration-1	163411	Felony A
Sexual Penetration-2	163408	Felony B
Sexual Abuse-1	163427	Felony B
Sexual Abuse-2	163425	Felony C
Custodial Sexual Misconduct - 1	163452	Felony C
Incest	163525	Felony C
Child Neglect-1	163547	Felony B
Using Child in Display of Sexually Explicit Conduct	163670	Felony A
Encouraging Child Sex Abuse-1	163684	Felony B
Encouraging Child Sex Abuse-2	163686	Felony C
Possession of Child Sex Material-1	163688	Felony B
Possession of Child Sex Material-2	163689	Felony C
Theft by Extortion	164075	Felony B
Burglary-1	164225	Felony A
Arson-1	164325	Felony A
Robbery-1	164415	Felony A
Robbery-2	164405	Felony B
Robbery-3	164395	Felony C
Treason	166005	Treason
Riot	166015	Felony C
Intimidation – 1	166165	Felony C
Unlawful Possession of Firearms/Silencer	166272	Felony B
Unlawful Manufacture/Sale /Possession of Firearms	166410	Felony B
Compelling Prostitution	167017	Felony B
Aggravated Animal Abuse – 1	167322	Felony C

Appendix B

List of potential predictor variables

Note: Variables remaining in the final OYA Recidivism Risk Assessment – Violent Crime (ORRA-V) are identified with a solid bar on the left.

ORIGINAL FIELD NAME ***> ORRA Variable Name***	**DESCRIPTION / COMMENTS**
YOUTH ID	Foreign key that is a primary key on the Youth Table.
JJIS NUMBER	Number uniquely identifying a youth in the JJIS application. The JJIS number may be used on the youth search screen to find a particular youth. The JJIS number is created by the JJIS system and cannot be changed or deleted.
YOUTH NAME	Last, first and middle name of the youth.
DOB	Date indicating the month, day and year the youth was born.
CURRENT AGE	Youth's age as of the report run date.
AGE AT 1ST DELINQUENCY REFER	Age of the youth at the time of the first delinquency referral of the youth. This is determined by finding the earliest delinquency referral for the youth and extracting the age of the youth when that referral was received.
RACE/ETHN	Text that describes the ethnic physical traits of the youth, modified in certain cases for reporting purposes.
SEX ***> Male***	Code that represents the gender of the youth as male, female, etc. The value of this column is derived from the Entity table in the JJIS production database.
SID #	Youth's state identification number.
DOC RECORD KEY	Record Identifier for the youth in Department of Corrections Information Systems.
EVENT	Name of the event for this record. Must be 'RELEASED FROM CLOSE CUSTODY', 'OYA PROBATION' or 'COUNTY PROBATION'. This is the 'group name' in the 'merged' cohort record.
RELEASE OR PROBATION DATE	The date the youth was released from close custody or placed on probation.
RELEASE REASON OR PROBATION DISPOSITION	The reason the youth was released from close custody or type of probation.
DISPOSITION ROLLUP START	The start date of the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISPOSITION ROLLUP END	The end date of the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISPOSITION TYPE CODE	The type code of the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISPOSITION TYPE DESCRIPTION	The disposition description of the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).

ORIGINAL FIELD NAME ***> ORRA Variable Name***	**DESCRIPTION / COMMENTS**
DISPOSITION INTENSITY LEVEL	The intensity level of the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
INTENSITY RANKING	The intensity ranking of the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISP ALLEGATION ID 1	Allegation ID of the most serious allegation for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISP ORS NUMBER 1	ORS number of the most severe allegation for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISP ORS DESCRIPTION 1	ORS description of the most severe allegation for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISP ORS TYPE CODE 1	ORS type code of the most severe allegation for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISP ORS CLASS CODE 1	ORS class code of the most severe allegation for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISP ORS SEVERITY CODE 1	ORS severity code of the most severe allegation for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISP OFFENSE CATEGORY ROLLUP 1	Offense category rollup of the most severe allegation for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISP OYA CATEGORY CODE 1	OYA category code of the most severe allegation for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISP REGISTERABLE CRIME FLAG 1	Flag to identify if the most severe offense for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation) is a registerable crime. (Y = Yes, N = No)

ORIGINAL FIELD NAME ***> ORRA Variable Name***	**DESCRIPTION / COMMENTS**
DISP SEX OFFENSE INDC 1	Indicator to identify if the most severe offense for youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation) is a sex crime. (1 = Yes, 0 = No)
DISP WEAPONS INDC 1	Indicator to identify if the most severe offense for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation) involved a weapon. (1 = Yes, 0 = No)
DISP ALLEGATION ID 2	Allegation ID of the second most serious allegation for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISP ORS NUMBER 2	ORS number of the second most severe allegation for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISP ORS DESCRIPTION 2	ORS description of the second most severe allegation for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation)..
DISP ORS TYPE CODE 2	ORS type code of the second most severe allegation for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISP ORS CLASS CODE 2	ORS class code of the second most severe allegation for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISP ORS SEVERITY CODE 2	ORS severity code of the second most severe allegation for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISP OFFENSE CATEGORY ROLLUP 2	Offense category rollup of the second most severe allegation for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
OYA CATEGORY CODE 2	OYA category code of the second most severe allegation for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation).
DISP REGISTERABLE CRIME FLAG 2	Flag to identify if the second most severe offense for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation) is a registerable crime. (Y = Yes, N = No)

ORIGINAL FIELD NAME *> ORRA Variable Name*	DESCRIPTION / COMMENTS
DISP SEX OFFENSE INDC 2	Indicator to identify if the second most severe offense for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation) is a sex crime. (1 = Yes, 0 = No)
DISP WEAPONS INDC 2	Indicator to identify if the second most severe offense for the youth's most recent disposition that matches the event type (County Probation, OYA Probation, OYA YCF, or DOC) that is less than or equal to the event release date (for YCF or DOC) or event probation date (for County Probation or OYA Probation) involved a weapon. (1 = Yes, 0 = No)
TOTAL PRIOR REFERALS WITH SEX OFFENSE INDC	Total number of referrals prior to the disposition start date with a sex offense. (The sex offense may not have been the most serious felony or misdemeanor offense on the referral.)
TOTAL PRIOR REFERALS WITH WEAPONS OFFENSE INDC ***> Prior weapon offense referral***	Total number of referrals prior to the disposition start date with a weapons offense. (The weapon offense may not have been the most serious felony or misdemeanor offense on the referral.)
TOTAL PRIOR REFER WITH FEL ORIG ALLEG	Total number of referrals prior to the disposition start date with felony allegations.
TOTAL PRIOR REFER WITH MIS ORIG ALLEG ***> Total prior misdemeanor referrals***	Total number of referrals prior to the disposition start date with misdemeanor allegations.
PRIOR MS FEL REFERRAL COUNT ***> Total prior felony referrals***	Total number of referrals prior to the disposition start date where the most serious offense was a felony.
PRIOR MS FEL ARSON COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious felony offense was arson.
PRIOR MS FEL ASSAULT COUNT ***> Prior felony theft referral***	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious felony offense was assault.
PRIOR MS FEL BURGLARY COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious felony offense was burglary.
PRIOR MS FEL CRIMINAL_MISCHIEF COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious felony offense was criminal mischief.
PRIOR MS FEL CRIMINAL OTHER COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious felony offense was criminal other.
PRIOR MS FEL DISORDERLY COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious felony offense was disorderly conduct.
PRIOR MS FEL HOMICIDE RELATED COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious felony offense was homicide related.
PRIOR MS FEL PERSON OTHER COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious felony offense was person other.
PRIOR MS FEL PROPERTY OTHER COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious felony offense was property.
PRIOR MS FEL PUBLIC ORDER COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious felony offense was public order.

ORIGINAL FIELD NAME *> ORRA Variable Name*	DESCRIPTION / COMMENTS
PRIOR MS FEL ROBBERY COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious felony offense was robbery.
PRIOR MS FEL SEX OFFENSE COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious felony offense was a sex offense.
PRIOR MS FEL SUBSTANCE COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious felony offense was substance/alcohol.
PRIOR MS FEL THEFT COUNT ***> Prior felony theft referral***	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious felony offense was theft.
PRIOR MS FEL WEAPON COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious felony offense was weapon.
PRIOR MS MIS REFERRAL COUNT	Total number of referrals prior to the disposition start date where the most serious offense was a misdemeanor.
PRIOR MS MIS ARSON COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was arson.
PRIOR MS MIS ASSAULT COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was assault.
PRIOR MS MIS BURGLARY COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was burglary.
PRIOR MS MIS CRIMINAL_MISCHIEF COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was criminal mischief.
PRIOR MS MIS CRIMINAL OTHER COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was criminal other.
PRIOR MS MIS CRIMINAL TRESSPASS COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was criminal trespass.
PRIOR MS MIS DISORDERLY COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was disorderly conduct.
PRIOR MS MIS HARASSMENT COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was harassment.
PRIOR MS MIS PERSON OTHER COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was person other.
PRIOR MS MIS PROPERTY OTHER COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was property other.
PRIOR MS MIS PUBLIC ORDER COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was public order.
PRIOR MS MIS ROBBERY COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was robbery.
PRIOR MS MIS SEX OFFENSE COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was sex offense.
PRIOR MS MIS SUBSTANCE COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was substance/alcohol.
PRIOR MS MIS THEFT COUNT ***> Prior misdemeanor theft referral***	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was theft.
PRIOR MS MIS WEAPON COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was weapon.

ORIGINAL FIELD NAME *> ORRA Variable Name*	DESCRIPTION / COMMENTS
PRIOR MS VIO REFERRAL COUNT	Total number of referrals prior to the disposition start date where the most serious offense was a violation.
PRIOR MS VIO ALCOHOL COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was alcohol/MIP.
PRIOR MS VIO CURFEW COUNT ***> Prior curfew violation referral***	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was curfew.
PRIOR MS VIO HARASSMENT COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was harassment.
PRIOR MS VIO LESS THAN OUNCE COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was less than ounce.
PRIOR MS VIO MOTOR VEHICLE COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was motor vehicle.
PRIOR MS VIO NONCRIMINAL OTHER COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was non-criminal other.
PRIOR MS VIO SUBSTANCE COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was substance/alcohol.
PRIOR MS VIO THEFT COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was theft.
PRIOR MS VIO TOBACCO COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was tobacco.
PRIOR MS DST DEPENDENCY STATUS COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was dependency status offense other.
PRIOR MS DST RUNAWAY COUNT ***> Total prior runaway referrals***	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was runaway.
PRIOR MS_FED_OTHER_COUNT	Total number of referrals prior to the disposition start date where the offense category rollup of the most serious offense was other.
PRIOR ADJUD DISP COUNT	Total number of adjudicated dispositions prior to the disposition start date. NOTE: all adjudicated dispositions are counted even if the disposition is a graduated sanction for the same offense. In the below example, the Burglary I offense will be counted for both the OYA Probation row and for the YCF Release row. Example: OYA Probation on 10/10/02 for Burglary I YCF Commitment on 12/19/02 for Burglary I
PRIOR OYA YCF DISP COUNT	Total number of OYA YCF commitment dispositions prior to the disposition start date. NOTE: all adjudicated dispositions are counted even if the disposition is a graduated sanction for the same offense. In the below example, the Burglary I offense will be counted for both the OYA Probation row and for the YCF Release row. Example: OYA Probation on 10/10/02 for Burglary I YCF Commitment on 12/19/02 for Burglary I

ORIGINAL FIELD NAME ***> ORRA Variable Name***	**DESCRIPTION / COMMENTS**
PRIOR OYA PROB DISP COUNT	Total number of OYA probation dispositions prior to the disposition start date. NOTE: all adjudicated dispositions are counted even if the disposition is a graduated sanction for the same offense. In the below example, the Burglary I offense will be counted for both the OYA Probation row and for the YCF Release row. Example: OYA Probation on 10/10/02 for Burglary I YCF Commitment on 12/19/02 for Burglary I
PRIOR COUNTY PROB DISP COUNT	Total number of county probation dispositions prior to the disposition start date. NOTE: all adjudicated dispositions are counted even if the disposition is a graduated sanction for the same offense. In the below example, the Burglary I offense will be counted for both the OYA Probation row and for the YCF Release row. Example: OYA Probation on 10/10/02 for Burglary I YCF Commitment on 12/19/02 for Burglary I
PRIOR DOC DISP COUNT	Total number of DOC commitments dispositions prior to the disposition start date. NOTE: all adjudicated dispositions are counted even if the disposition is a graduated sanction for the same offense. In the below example, the Burglary I offense will be counted for both the OYA Probation row and for the YCF Release row. Example: OYA Probation on 10/10/02 for Burglary I YCF Commitment on 12/19/02 for Burglary I
PRIOR OTHER AGENCY COUNT	Total number of Other Agency commitment dispositions prior to the disposition start date. NOTE: all adjudicated dispositions are counted even if the disposition is a graduated sanction for the same offense. In the below example, the Burglary I offense will be counted for both the OYA Probation row and for the YCF Release row. Example: OYA Probation on 10/10/02 for Burglary I YCF Commitment on 12/19/02 for Burglary I
REVOKED SINCE RELEASE	Indicator to identify if the youth has been revoked since their release from close custody. (1 = Yes, 0 = No)
FIRST REVOKE SINCE RELEASE	The date of the youth's first revocation since their release from close custody.
PRIOR CLOSE CUSTODY EPISODES	Total number of the close custody episodes prior to the disposition start date.
PRIOR CLOSE CUSTODY DAYS	Total number of days for the prior close custody episodes.
PRIOR DETENTION EPISODES	Total number of the detention episodes prior to the disposition start date.
PRIOR DETENTION DAYS	Total number of days for the prior detention episodes.
PRIOR SUBCARE EPISODES	Total number of prior subcare episodes prior to the disposition start date.
PRIOR SUBCARE DAYS	Total number of days for the prior subcare episodes.