

Pretrial Risk Assessment Tool Validation

PRETRIAL PILOT PROGRAM

COUNTY OF TULARE

JULY 2022



JUDICIAL COUNCIL
OF CALIFORNIA

OPERATIONS AND PROGRAMS DIVISION
CRIMINAL JUSTICE SERVICES

Impact of the COVID-19 PANDEMIC on the Pretrial Pilot Program

The Budget Act of 2019 requires that Pretrial Pilot Program courts collaborate with local justice system partners to make data available to the Judicial Council as required to measure the outcomes of the pilots. Senate Bill 36 (Hertzberg; Stats. 2019, ch. 589) established tool validation and reporting requirements for pretrial services agencies using a pretrial risk assessment tool; these requirements are mandatory for all pilot projects.

Throughout much of period covered by this report, the United States experienced the COVID-19 global pandemic. On March 4, 2020, Governor Gavin Newsom declared a state of emergency to protect public health and safety, and formalized efforts by the California Department of Public Health, California Health and Human Services Agency, Governor's Office of Emergency Services, and other state agencies and departments to mitigate this public health crisis. On March 19, 2020, orders from the Governor and the California Department of Public Health directed all California residents to stay home except when performing essential jobs or shopping for necessities.

On March 27, 2020, the Governor issued an order that gave the Judicial Council of California and the Chief Justice authority to adopt emergency rules and take other necessary actions to respond to the COVID-19 health and safety crisis. The Judicial Council adopted various emergency measures to support courts in providing essential services while helping to safely reduce jail populations. These measures, together with policies adopted by individual courts in response to the crisis, have impacted the population eligible for participation in the Pretrial Pilot Program.

On April 6, 2020, the Judicial Council adopted a statewide emergency bail schedule that set presumptive bail at \$0 for most misdemeanors and lower-level felonies, with specified exceptions, but retained court discretion in setting bail. The emergency rule was intended to safely reduce jail populations and protect justice system personnel and public health while promoting consistency in pretrial release and detention throughout the state. The Judicial Council repealed the emergency bail schedule rule effective June 20, 2020 but encouraged courts to adopt local emergency bail schedules with \$0 bail or significantly reduced bail levels to meet their county's public health and safety conditions.

As a result of local criminal justice system policies and the emergency bail schedule, pilot courts observed significant reductions in booking rates and jail populations during this time. Under these temporary emergency policies, many individuals who would otherwise have been eligible for program participation were cited and released in the field or released on \$0 bail upon booking without undergoing a risk assessment. Crime and arrest patterns were also likely affected by COVID-19 and shelter-in-place orders. Criminal case dispositions also slowed during this time period.

Therefore, the population of program participants is very likely different than would be seen in the absence of the pandemic, both in terms of reduced numbers and composition.

TULARE PSA VALIDATION INTRODUCTION

SB 36 requires each pretrial services agency that uses a pretrial risk assessment tool to validate the risk assessment tool used by the agency by July 1, 2021, and regularly thereafter. This pretrial risk assessment tool validation report is the first validation of the Public Safety Assessment tool in Tulare County. The study examines data from covering the period from July 3, 2018 to December 31, 2021.

LEGISLATIVE MANDATE

This report fulfills the legislative mandates of the Budget Act of 2019 (Assem. Bill 74; Stats. 2019, ch. 23), and Senate Bill 36 (Stats. 2019, ch. 589). In AB 74, the Legislature directed the Judicial Council to administer pretrial projects in the trial courts. The goals of the Pretrial Pilot Program, as set by the Legislature, are to:

- Increase the safe and efficient pre-arraignment and pretrial release of individuals booked into jail;
- Implement monitoring practices with the least restrictive interventions necessary to enhance public safety and return to court;
- Expand the use and validation of pretrial risk assessment tools that make their factors, weights, and studies publicly available; and
- Assess any disparate impact or bias that may result from the implementation of these programs.

SB 36 requires each pretrial services agency that uses a pretrial risk assessment tool to validate the risk assessment tool used by the agency by July 1, 2021, and regularly thereafter, and to make specified information regarding the tool, including validation studies, publicly available.

AB 74 provided funding to the Judicial Council “for costs associated with implementing and evaluating the Pretrial Pilot Program, including, but not limited to “...(e) Assisting the pilot courts in validating their risk assessment tools.” This report, in accordance with [AB 74](#) and [SB 36](#), provides information on the validation of the PSA pretrial risk assessment tool used by Tulare.

SB 36 requires pretrial risk assessment tools to be validated. SB 36 defines “validate” as follows:

“Validate” means using scientifically accepted methods to measure both of the following:

(A) The accuracy and reliability of the risk assessment tool in assessing (i) the risk that an assessed person will fail to appear in court as required and (ii) the risk to public safety due to the commission of a new criminal offense if the person is released before the adjudication of the current criminal offense for which they have been charged.

(B) Any disparate effect or bias in the risk assessment tool based on Gender, Race, or ethnicity.¹

VALIDATION METHODS

Descriptive statistics are presented, exploring basic features of the data such as demographics and showing the overall distributions of arrest offenses and adverse outcomes. The distributions of risk scores are shown in groupings of risk level defined by the tool developer.

¹ Sen. Bill 36, § 1320.35(b)(4).

A Receiver Operating Characteristic (ROC) curve model has been used to provide the Area Under the Curve (AUC) statistic for each outcome of interest. The outcomes of interest are:

- Failure to appear (FTA)
- New arrest
- New filing
- New conviction
- New violent arrest

The AUC value is a single number that represents the ability of the tool to differentiate between individuals at lower or higher risk across the range of the tool. The AUC is calculated for each outcome of interest.

For criminal justice risk assessments, a common metric for evaluating AUC values is derived from Desmarais and Singh (2013),² who defined AUC values less than 0.55 as poor, 0.55-0.63 as fair, 0.64-0.70 as good, and 0.71-1.00 as excellent.

The observed rate of adverse outcomes at each score is presented. The pattern of these rates is an indicator of the accuracy of the tool, showing whether risk scores predict monotonic increasing failure rates for each outcome of interest.

Logistic regression is a test that determines whether the risk scores statistically significantly predict the likelihood of each outcome of interest. Statistical significance is a technical term used in analyses to indicate that it is very unlikely that a result or difference occurred by chance. Statistical significance does not necessarily specify the size of the result or difference.

The risk scores presented in this report are calculated using a scoring scheme designed by the tool developers. The tool takes into account aspects of an individual's criminal history, current criminal offense, history of failures to appear in court, age, and other factors (see Appendix A, Tables A1 and A2 for the factors and weights specific to each subscale of the PSA). Gender and race are not used to calculate risk scores.

This report analyzes risk scores and associated outcomes for individuals who were released from custody pretrial. Individuals may have been released in a variety of ways by a Sheriff or judge, including on bail. This report does not look at judicial decision-making or judges' use of the risk assessment tool.

Further research is needed to analyze the elements that may be driving the observed differences and whether there are data-driven modifications to the tool's risk factors or weights that can further improve the predictive power of the tool.

² Desmarais, S. L., & Singh, J. P. (2013). Risk assessment instruments validated and implemented in correctional settings in the United States. *Lexington, KY: Council of State Governments.*

DEFINITIONS

- **Pretrial period** starts at the booking of an individual at the jail and ends at the resolution of any and all cases associated with that booking
- **Failure to appear** (FTA) is measured using court records documenting the issuance of a bench warrant for FTA during the pretrial period.
- **New arrest** is any new arrest during the pretrial period reported to the California Department of Justice (CA DOJ) or a new booking within county recorded by the jail.³
- **New filing** is any new arrest during the pretrial period that results in charges filed with the court and reported to the CA DOJ.⁴
- **New conviction** is any new arrest during the pretrial period that results in a conviction reported to the CA DOJ during the data collection period.⁵
- **New violent arrest** is any new arrest during the pretrial period for an offense on the list of PSA Pretrial Pilot consensus violent offense list, which includes felonies and misdemeanors of a violent nature. For the full list of offenses see Appendix B.

VALIDATION SAMPLE SIZES

For purposes of this report, general validation results are shown when the sample size was greater than 200. For analyses of predictive bias by race/ethnicity and gender, subgroup results are shown when the overall sample was at least 1,000 and each subgroup size was greater than 200. Sample sizes smaller than these may not produce reliable results. Tulare's sample size was sufficient for general validation results and for analyses of predictive bias by race/ethnicity for White and Hispanic groups. Analysis of predictive bias by gender was not possible due to the large number of unknown gender values.

DATA DESCRIPTION AND LIMITATIONS

The data set for the pretrial risk assessment tool validation was created using data from the court and two agencies in the county, as well as statewide data from the California Department of Justice.

DATA SOURCES

- **Jail booking data:** Tulare sheriff's office provided information on all individuals booked into local county jail, including booking dates, charges, and releases.
- **Probation data:** Tulare probation department performed pretrial assessment services and provided pretrial risk assessment information, including assessment dates, scores, and recommendation for those assessed.
- **Court case data:** Tulare superior court provided court case information, including pretrial disposition dates and the issuance of warrants for failures to appear for those with felony or misdemeanor criminal filings.

³ New criminal offenses are defined in four ways to capture different outcomes of interest. All new criminal offense indicators are measured using data from the California Department of Justice (CA DOJ).

⁴ CA DOJ records on arrests are likely more complete than CA DOJ records on court filings and dispositions. Court reporting to the CA DOJ is incomplete.

⁵ Because of the short timeframe of the data collection period and delays in court reporting to the CA DOJ, new convictions may not be a complete measure of all arrests during the pretrial period that resulted in a conviction.

- **California Department of Justice Data (CA DOJ) data:** The California Department of Justice provided arrest and disposition data, including out-of-county filings, for booked defendants.

DATE RANGE

The time period for this validation extends from July 3, 2018 to December 31, 2021.

DATA LINKING AND FILTERING

Data were viewed based on a data sharing agreement, and data views were joined and standardized to create a validation data frame of bookings with associated pretrial risk assessment information, relevant court case information, and outcomes during the pretrial period. Local justice agencies keep separate data systems, and not all data could be matched across agencies. Due to the limited timeframe of the data and the effects of COVID-19 on court operations, data are likely skewed towards dispositions that occur in a shorter time frame compared to all dispositions, and many individuals who were released pretrial may not have had final dispositions during the validation time frame and therefore could not be included in the validation sample. The only bookings included in the validation analysis were those for which the individual was released pretrial and there was a final disposition associated with the booking because outcomes during the pretrial period were a primary interest of this analysis and also so that the full pretrial period could be observed. This report refers to each booking linked with an associated assessment and completed pretrial period as a “pretrial observation.”

Table 1 shows the number of assessments at each stage of filtering, and the type of validation that will be presented based on the number of pretrial observations.

Table 1. Counts of all assessments at each stage of filtration

Tool Name	County	Assessments	Assessed Bookings	Pretrial Complete	Validation Dataset	Validation Type
PSA	Tulare	10,208	10,325	3,922	1,146	General + Bias

DESCRIPTIVE STATISTICS

DEMOGRAPHICS

Table 2 provides the number of assessments in the evaluation dataset, the racial/ethnic and gender makeup, and the median age. The evaluation sample was 64% Hispanic, 26% White, and 5% Black. The evaluation sample contained gender data that was 77% unknown, 16% male and 5% female,⁶ and the median age was 35 years old.

⁶ Non-binary, other, and unknown genders represented less than 0.1% of the bookings in the evaluation dataset. Demographic data is drawn exclusively from jail data, forthcoming updates to the code for processing data will use

Table 2. Demographic Profile of Evaluation Data Frame

County	Total	Race/Ethnicity (%)				Gender (%)		Median Age
		Black	White	Hispanic	Other	Male	Female	
Tulare	1,146	5	26	64	4	16	5	35

ARREST OFFENSES

As shown in Table 3, misdemeanor arrests represented 14% of the bookings while felony arrests were 7%, the remaining bookings had unknown or undefined offense level. Violent offenses⁷ represented 8% of bookings in the evaluation dataset, while property offenses were 3% and drug offenses were 7%. DUI offenses represented 2% of bookings in the evaluation dataset, while DV offenses made up 6%. Most bookings had unknown or undefined offense types.

Table 3. Distribution of Arrest Offense Type in Evaluation Data Frame

County	Felony	Misdemeanor	Violent	Property	Drug	DUI	DV
Tulare	7	14	8	3	7	2	6

ADVERSE OUTCOMES

Table 4 shows several different adverse outcomes that were measured during the pretrial period from pretrial release to disposition. Failure to appear (FTA), measured as bench warrants issued for FTA during the pretrial period, were recorded for 27.8% of pretrial observations. New arrests during the pretrial period were recorded for 33.5% of pretrial observations. New arrests during the pretrial period resulting in filed charges were recorded for 18.9% of pretrial observations, and new arrests during the pretrial period resulting in convictions were recorded for 15.4% of pretrial observations.⁸ New violent arrests⁹ – including felony and misdemeanor arrests for offenses of a violent nature – were recorded during the pretrial period for 6.1% of pretrial observations.

probation data when jail data are missing. Gender bias analysis for Tulare will be conducted data when code updates are implemented.

⁷ Violent offenses as defined by the pilot consensus PSA Violent Offense List, see Appendix B. These include both felonies and misdemeanors that are violent in nature.

⁸ New arrest, new filing, and new conviction data are measured using CA DOJ data. New arrests and new violent arrests are reported to the CA DOJ from arresting agencies, whereas new filings and new convictions are reported to the CA DOJ from courts. The CA DOJ may have incomplete records of filings and convictions from the courts because of difficulties or delays in reporting, and not all new arrests during the pretrial period may have been resolved during the data collection period.

⁹ New violent arrests are defined by the PSA Violent Offense List (see Appendix B)

Table 4. Rates of Pretrial Misconduct in Evaluation Data Frame

County	FTA	New Arrest	New Filing	New Conviction	New Violent Arrest
Tulare	27.8	33.5	18.9	15.4	6.1

CONDITIONS OF MONITORING/SUPERVISION

Data on supervision conditions were collected from the county probation department. Supervision conditions may have affected outcomes and may have been applied differentially according to risk score which could confound results. Further research is needed to determine the impact of supervision conditions and to separate out the efficacy of the tools from the efficacy of supervision conditions.

TULARE PSA VALIDATION

GENERAL VALIDATION

Figure 1 shows the full distribution of risk levels for individuals in the evaluation dataset assessed with the PSA tool, for each PSA subscale. The PSA FTA subscale was designed to predict the risk of failure to appear in court. The PSA NCA scale was designed to predict the risk of a new arrest, and the PSA NVCA flag was designed to predict new arrest for a violent crime. As determined by the tool developers, the FTA and NCA subscales are each divided into 6 risk levels with 1 representing the lowest risk and 6 the highest, and the NVCA subscale is divided into a binary flag, such that a flag represents higher risk of new violent crime and no flag represents lower risk of new violent crime.¹⁰ Lower scores were more common for the FTA subscale, mid-range scores were more common for the NCA subscales, and 19% of assessed individuals received a NVCA flag.

¹⁰ The NVCA subscale is scaled to a 1-6 scale, and then scores 1-3 are categorized as no flag and scores 4-6 are categorized as flagged.

Figure 1. Distribution of PSA FTA, NCA and NVCA Risk Scores

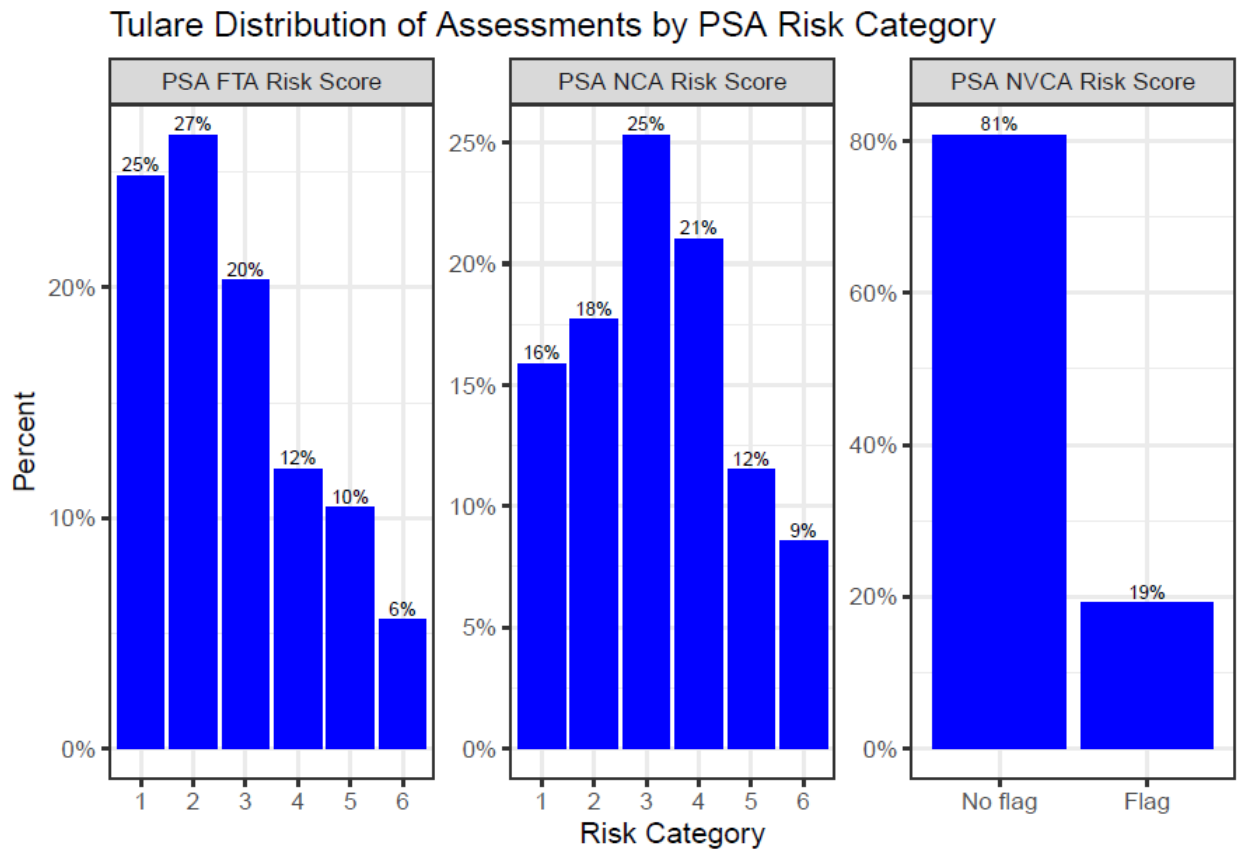


Table 5. Counts of Individuals by PSA FTA, NCA and NVCA Risk Scores

PSA FTA Risk Score	Total
1	285
2	305
3	233
4	139
5	120
6	64

PSA NCA Risk Score	Total
1	182
2	203
3	290
4	241
5	132
6	98

PSA NVCA Risk Score	Total
No flag	926
Flag	220

Table 6 shows the AUC values for the PSA subscales, using the full range of risk scores, for each outcome of interest. The AUC value is a single number that represents the ability of the tool to differentiate between individuals who are lower or higher risk across the range of the tool. For criminal justice risk assessments, a common metric for evaluating AUC values is derived from Desmarais and Singh (2013),¹¹ who defined AUC values less than 0.55 as poor, 0.55-0.63 as fair, 0.64-0.70 as good, and 0.71-1.00 as excellent. By these definitions, the AUC values for the PSA in Tulare are fair for FTA and new violent arrest and good for new arrest, new filing, and new conviction.

The 95% confidence interval is also shown, which represents the range of AUC estimates the true AUC value is statistically 95% likely to fall between. A smaller range indicates that given the size of the sample and pattern of the data, the AUC can be estimated with greater precision.

Table 6. AUC values for Outcomes of Interest

Risk Score	Outcome	AUC	CI (95%)
PSA FTA	FTA	0.590	0.554-0.626
PSA NCA	New Arrest	0.685	0.653-0.716
PSA NCA	New Filing	0.669	0.628-0.709
PSA NCA	New Conviction	0.688	0.644-0.731
PSA NVCA	New Violent Arrest	0.618	0.559-0.678

Note:

N = 1146

Figure 2 shows the rate of various adverse outcomes during the pretrial period at each risk level of the PSA, using each of the PSA subscales for the relevant outcomes. The PSA-FTA risk scale is used for the outcome of FTA. The PSA-NCA risk scale is used for the outcomes of new arrest, new filing, and new conviction. The PSA-NVCA risk flag is used for the outcome of new violent arrest. For each outcome of interest,¹² observed rates of the outcome generally increase as the assessed risk level increases, but for the FTA outcome the pattern is not consistent at the highest risk level.

¹¹ Desmarais, S. L., & Singh, J. P. (2013). Risk assessment instruments validated and implemented in correctional settings in the United States. *Lexington, KY: Council of State Governments.*

¹² See validation methodology section for definitions of each outcome of interest.

Figure 2. PSA Outcomes by Risk Category

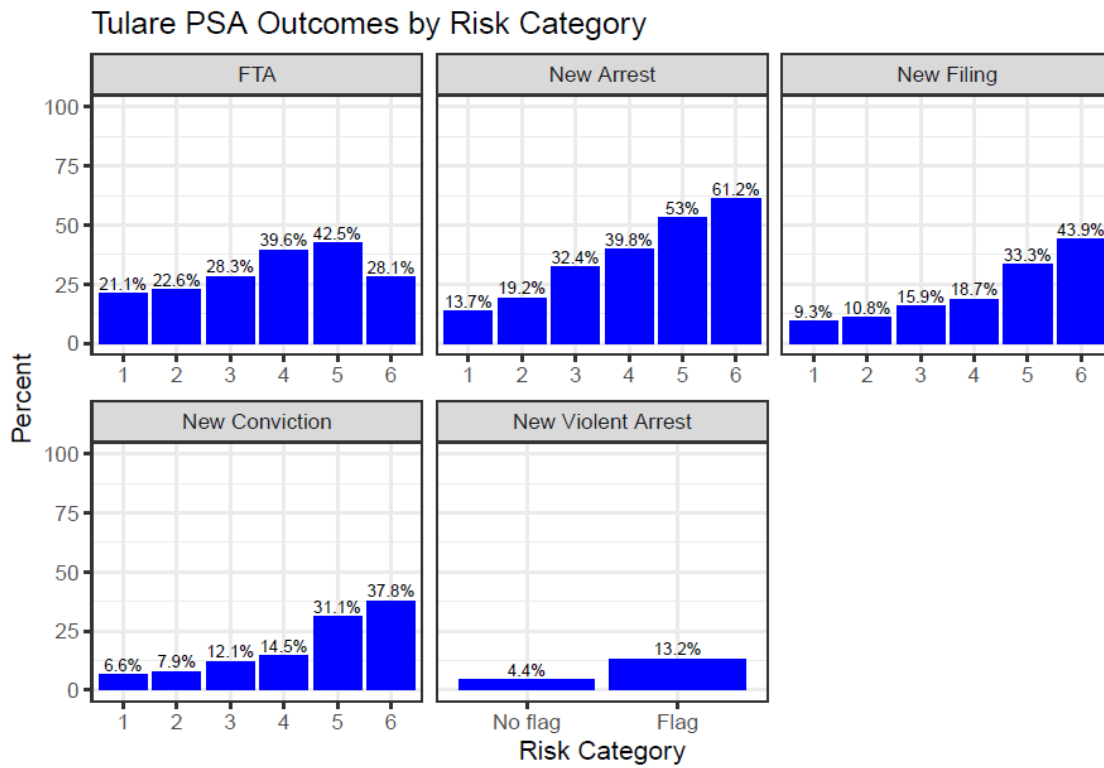


Table 7 shows the results from logistic regression models predicting each outcome of interest. The models control for the number of days the defendant spent released during the pretrial period, which is a statistically significant ($p < .001$) predictor of all outcomes of interest. The longer an individual spends on release, the more likely the individual is to experience the adverse outcomes during the pretrial period. For all outcomes of interest, the models also show the association between the relevant PSA risk score and the likelihood of the outcome during the pretrial period is statistically significant ($p < .001$).

Table 7. Logistic Regression Models Predicting the Likelihood of Outcomes of Interest by Risk Scores Controlling for Days Released

	<i>Dependent variable:</i>				
	FTA (1)	New Arrest (2)	New Filing (3)	New Conviction (4)	New Violent Arrest (5)
PSA FTA Risk Score	0.218*** (0.046)				
PSA NCA Risk Score		0.485*** (0.048)	0.437*** (0.055)	0.481*** (0.060)	
PSA NVCA Risk Score					1.142*** (0.257)
Days Released	0.002*** (0.0003)	0.002*** (0.0003)	0.002*** (0.0003)	0.001*** (0.0003)	0.001** (0.0004)
Constant	-2.243*** (0.175)	-2.776*** (0.202)	-3.425*** (0.244)	-3.725*** (0.268)	-3.422*** (0.214)
Observations	1,146	1,146	1,146	1,146	1,146
Log Likelihood	-625.600	-653.146	-508.038	-450.150	-250.013
Akaike Inf. Crit.	1,257.200	1,312.291	1,022.076	906.300	506.026

Note:

*p<0.05; **p<0.01; ***p<.001

ANALYSIS OF PREDICTIVE BIAS

RACE

Figure 3 shows the distribution of risk assessment scores by race/ethnicity. The distribution of scores varies by race/ethnicity most notably for NVCA score. The number of assessed individuals in the White and Hispanic race/ethnicity groups (Table 8) are sufficient to run statistical tests that look at how the PSA tool scales performed by race/ethnicity for the White and Hispanic groups.

Figure 3. Distribution of Risk Scores by Race/Ethnicity

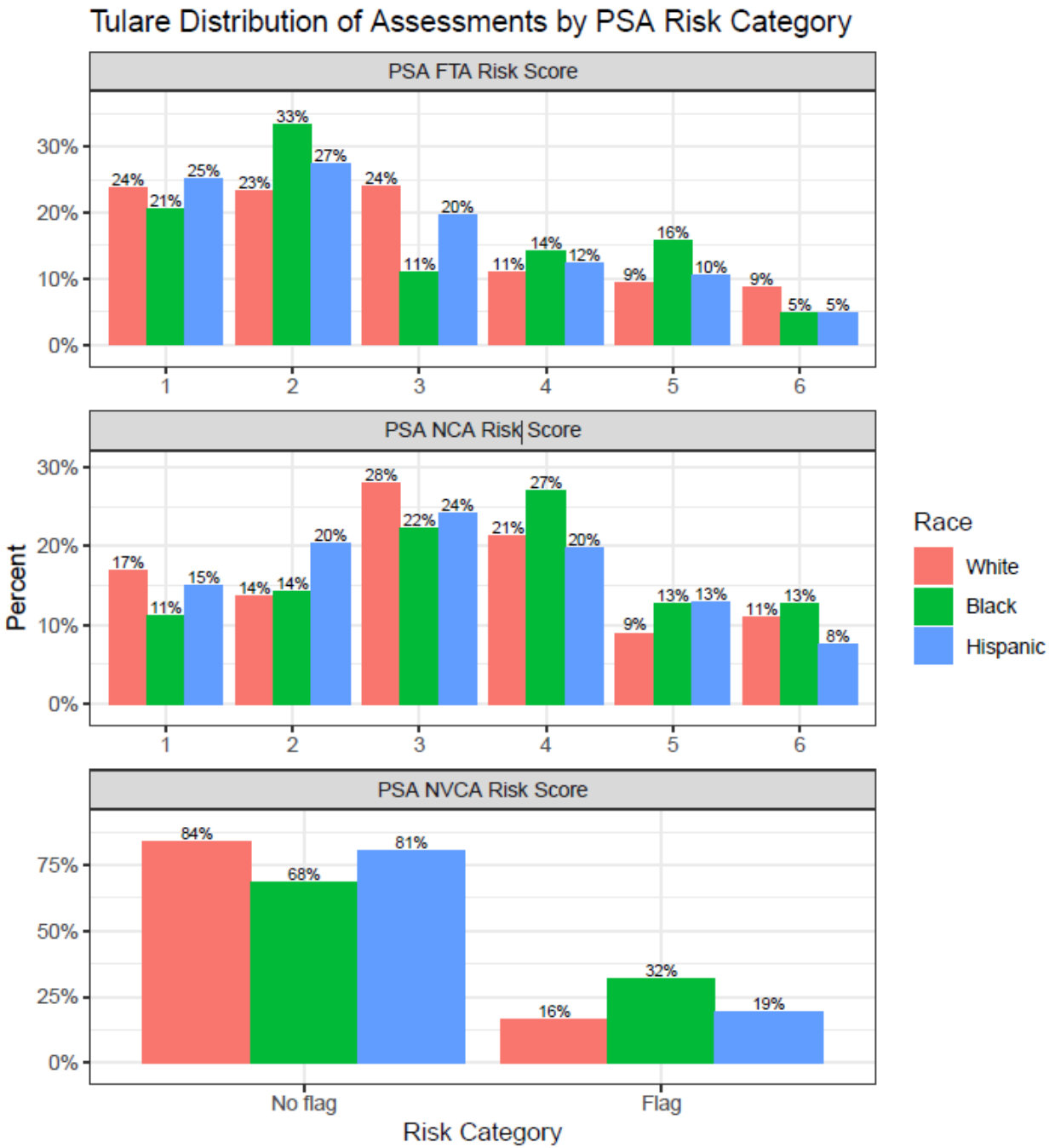


Table 8. Count of Individuals by FTA, NCA and NVCA Risk Scores and Race/Ethnicity

PSA FTA Risk Score	White	Black	Hispanic
1	71	13	185
2	70	21	202
3	72	7	145
4	33	9	91
5	28	10	77
6	26	3	35

PSA NCA Risk Score	White	Black	Hispanic
1	51	7	110
2	41	9	150
3	84	14	178
4	64	17	146
5	27	8	95
6	33	8	56

PSA NVCA Risk Score	White	Black	Hispanic
No flag	251	43	592
Flag	49	20	143

PSA NVCA Risk Score	White	Black	Hispanic
No flag	267	46	629
Flag	47	21	154

Table 9 shows the AUC values¹³ and 95% confidence intervals for each outcome of interest and relevant PSA risk subscale separately for each race/ethnicity group. Except for AUC values for new violent arrests (fair range) and FTA (poor or fair range), all other AUC values are in the good or excellent range. Statistical testing¹⁴ indicates a statistically significant difference between White and Hispanic AUCs for FTA. The Hispanic AUC is higher than the White AUC, indicating that the PSA FTA subscale has a stronger ability to distinguish between individuals who are lower or higher risk for Hispanic individuals than White individuals for the FTA outcome. No other statistically significant differences in AUC by race/ethnicity were found.

¹³ See page 9 for description of the meaning of AUC values.

¹⁴ DeLong's test for two ROC curves. (See Appendix C for results)

Table 9. AUC values for Outcomes of Interest by Race/Ethnicity

Risk Score	Outcome	AUC		CI (95%)	
		White	Hispanic	White	Hispanic
PSA FTA	FTA	0.511	0.612	0.438-0.584	0.567-0.657
PSA NCA	New Arrest	0.658	0.689	0.593-0.724	0.65-0.729
PSA NCA	New Filing	0.679	0.656	0.602-0.756	0.602-0.71
PSA NCA	New Conviction	0.726	0.667	0.648-0.804	0.609-0.725
PSA NVCA	New Violent Arrest	0.616	0.611	0.476-0.755	0.535-0.688

Note:

N White = 300 , N Hispanic = 735

Figure 4 shows the results of statistical models of the predictive power of the relevant PSA subscale for each outcome of interest for each race/ethnicity group. Each line represents the probability of each outcome of interest at each risk level separately for each race/ethnicity. The grey area around each line represents a 95% confidence interval. When the grey areas do not overlap, the evidence indicates there is likely a true difference between the groups. Conversely, when the grey areas overlap, the evidence may not be strong enough to conclude that there are differences between them. Notably, the slope of the White line looks flat across all PSA FTA risk levels.

Figure 4. Comparison of Racial/Ethnic Differences in Logistic Regression Curves

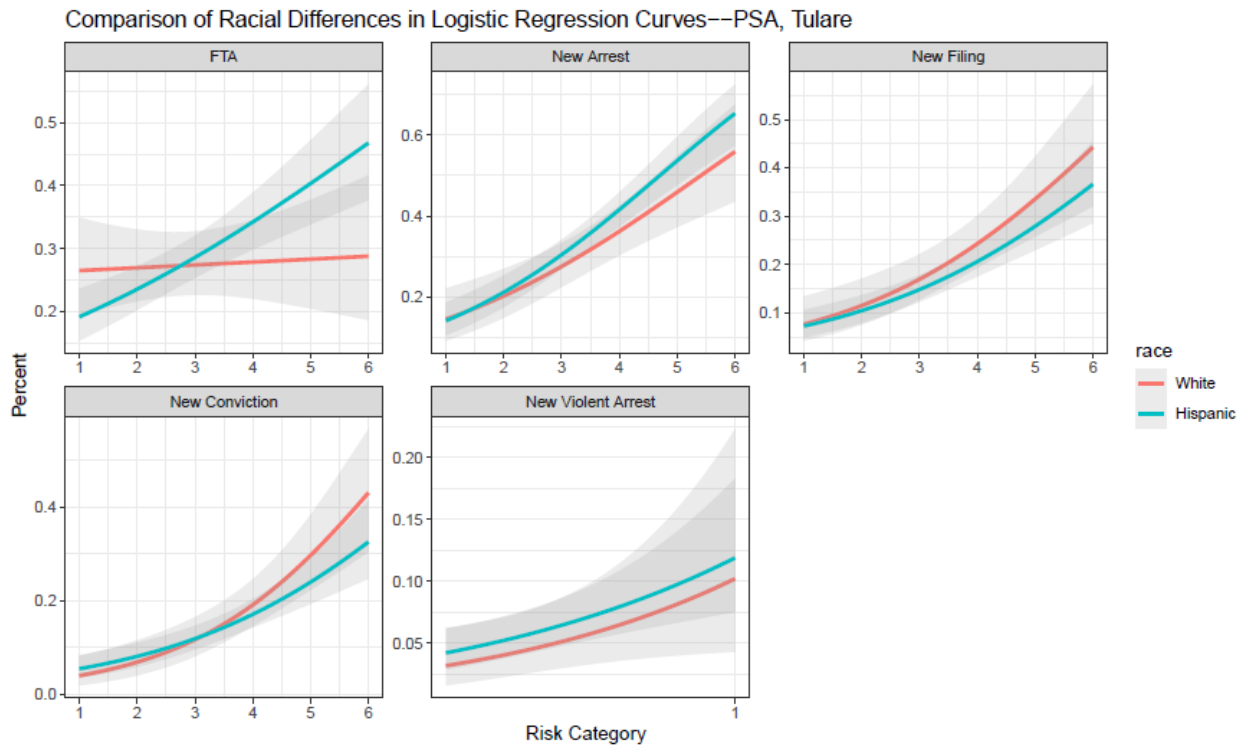


Table 10 shows the results of a logistic regression which predicts each outcome of interest by the relevant PSA subscale risk score, race, and number of days spent released. This statistical test compares Hispanic individuals with White individuals. The risk score on the relevant PSA subscale is, in each case, a statistically significant ($p < 0.001$) predictor of the outcome of interest. The number of days an individual was out on release also was a statistically significant predictor of all outcomes, indicating that the longer an individual spends on release, the more likely the individual is to experience these outcomes. Hispanic ethnicity was not to a statistically significant predictor of any of the outcomes of interest.

This statistical test is limited, however, because it tests for an overall effect of race across the full risk scale. As seen in Figure 4, there may be different patterns across particular ranges of the tool subscales. Table 11 displays the results from a more complex statistical model that allows for this possibility.

Table 10. Logistic Regression Model Predicting the Likelihood of Outcomes of Interest by Risk Scores and Race/Ethnicity, Controlling for Days released

	<i>Dependent variable:</i>				
	FTA (1)	New Arrest (2)	New Filing (3)	New Conviction (4)	New Violent Arrest (5)
PSA FTA Risk Score	0.207*** (0.048)				
PSA NCA Risk Score		0.472*** (0.050)	0.422*** (0.058)	0.475*** (0.063)	
PSA NVCA Risk Score					1.089*** (0.290)
Race:Hispanic	0.111 (0.162)	0.226 (0.157)	-0.184 (0.180)	-0.119 (0.196)	0.294 (0.330)
Days Released	0.002*** (0.0003)	0.002*** (0.0003)	0.001*** (0.0003)	0.001** (0.0003)	0.001* (0.0005)
Constant	-2.342*** (0.225)	-2.875*** (0.244)	-3.227*** (0.284)	-3.612*** (0.315)	-3.754*** (0.350)
Observations	1,035	1,035	1,035	1,035	1,035
Log Likelihood	-559.255	-591.163	-453.114	-400.255	-204.516
Akaike Inf. Crit.	1,126.510	1,190.326	914.229	808.510	417.032

Note:

* $p < 0.05$; ** $p < 0.01$; *** $p < .001$

Table 11 shows the results of a logistic regression which predicts each outcome of interest by the relevant PSA subscale risk score, race, the interaction between race and the PSA risk score, and number of days spent released. Risk score is a statistically significant predictor ($p < 0.001$) for new arrest, new filing, and new conviction, as is the number of days released for all outcomes. This statistical test again compares Hispanic individuals with White individuals. There is no evidence of a statistically significant interaction between Hispanic ethnicity and the PSA risk scores for any of the subscales. In the absence of a statistically significant interaction, the above model (Table 10) with no interaction is more appropriate to demonstrate the impact of Hispanic ethnicity.

Table 11. Logistic Regression Model Predicting the Likelihood of Outcomes of Interest by Risk Scores, Race/Ethnicity, and Interaction of Race/Ethnicity and Risk Scores, Controlling for Days released

	<i>Dependent variable:</i>				
	FTA (1)	New Arrest (2)	New Filing (3)	New Conviction (4)	New Violent Arrest (5)
PSA FTA Risk Score	0.073 (0.087)				
PSA NCA Risk Score		0.433*** (0.091)	0.481*** (0.103)	0.601*** (0.117)	
PSA NVCA Risk Score					1.133 (0.597)
Race:Hispanic	-0.267 (0.257)	0.085 (0.316)	0.056 (0.391)	0.415 (0.461)	0.315 (0.414)
Days Released	0.002*** (0.0003)	0.002*** (0.0003)	0.001*** (0.0003)	0.001** (0.0003)	0.001* (0.0005)
FTA*Hispanic	0.194 (0.105)				
NCA*Hispanic		0.055 (0.108)	-0.087 (0.125)	-0.182 (0.139)	
NVCA*Hispanic					-0.057 (0.682)
Constant	-1.864*** (0.238)	-2.301*** (0.286)	-2.973*** (0.347)	-3.521*** (0.414)	-3.769*** (0.396)
Observations	1,035	1,035	1,035	1,035	1,035
Log Likelihood	-557.534	-591.033	-452.868	-399.385	-204.513
Akaike Inf. Crit.	1,125.067	1,192.065	915.737	808.771	419.025

Note:

* $p < 0.05$; ** $p < 0.01$; *** $p < .001$

GENDER

As shown in Table 12, the subgroups by gender for the PSA in Tulare fall under the 1,000 overall sample size and the subgroup sample size threshold of 200 established for a gender bias analysis.

Table 12. Count of Individuals by Gender and FTA, NCA and NVCA Risk Scores

PSA FTA Risk Score	Male	Female
1	30	15
2	50	14
3	35	10
4	32	5
5	29	10
6	13	5

PSA NCA Risk Score	Male	Female
1	14	11
2	28	8
3	40	16
4	43	13
5	34	5
6	30	6

PSA NVCA Risk Score	Male	Female
No flag	133	43
Flag	56	16

Table A1. Public Safety Assessment (PSA): Factors and Weights

Risk Factor	Response	Weight
FAILURE TO APPEAR (0–7)		
Pending Charge at the Time of the Offense	No	0
	Yes	1
Prior Conviction	No	0
	Yes	1
Prior Failures to Appear Pretrial in Past 2 Years	0	0
	1	2
	2 or More	4
Prior Failure to Appear Pretrial Older than 2 Years	No	0
	Yes	1
NEW CRIMINAL ACTIVITY (0–13)		
Age at Current Arrest	23 or Older	0
	22 or Younger	2
Pending Charge at the Time of the Offense	No	0
	Yes	3
Prior Misdemeanor Conviction	No	0
	Yes	1
Prior Felony Conviction	No	0
	Yes	1
Prior Violent Conviction	0	0
	1 or 2	1
	3 or more	2
Prior Failure to Appear Pretrial in Past 2 Years	0	0
	1	1
	2 or More	2
Prior Sentence to Incarceration	No	0
	Yes	2
NEW VIOLENT CRIMINAL ACTIVITY (0–7)		
Current Violent Offense	No	0
	Yes	2
Current Violent Offense & 20 Years Old or Younger	No	0
	Yes	1
Pending Charge at the Time of the Offense	No	0
	Yes	1
Prior Conviction	No	0
	Yes	1
Prior Violent Conviction	0	0
	1 or 2	1
	3 or More	2

Source: [Public Safety Assessment: Risk Factors and Formula, Laura and John Arnold Foundation \(2013\)](#)

Table A2. Public Safety Assessment (PSA): Factors and Weights

Outcome Measure	Raw Score	Risk Scale
Failure to Appear (FTA)	0	1
	1	2
	2	3
	3	4
	4	4
	5	5
	6	5
	7	6
New Criminal Activity (NCA)	0	1
	1	2
	2	2
	3	3
	4	3
	5	4
	6	4
	7	5
	8	5
	9-13	6
Outcome Measure	Raw Score	NCVA Flag
New Violent Criminal Activity (NVCA)	0	No
	1	No
	2	No
	3	No
	4	Yes
	5	Yes
	6	Yes
	7	Yes

Source: [Public Safety Assessment: Risk Factors and Formula](#), Laura and John Arnold Foundation (2013)

Table B1. PSA Violent Offense List

PC CODE	Description
69	Obstructing or resisting exec officer in performance of duty; threats, force, or violence
136.1(c)(1)	Intimidating/Threat Witness/Victim and Act is accompanied by force
140(a)	Threatening Witnesses, victims or informants.
148(b)	Removal or taking of weapon other than firearm from peace officer during commission of resisting offense
148(c)	Removal or taking of firearm from peace officer during commission of resisting offense
148(d)	Removal or taking of weapon firearm from peace officer engaged in performance of duty
148.10(a)	Resist Po: Cause death/SBI
149	Assault by a public officer
151	Advocacy to kill or injure peace officer
186.26(c)	Use of coercion or violence to solicit or recruit another to actively participate in criminal street gang
187(a)	Murder first or second degree
191.5(a)	Gross vehicular manslaughter while intoxicated
192(a)	Voluntary manslaughter
192(b)	Involuntary manslaughter
192(c)(1)	Vehicular manslaughter with gross negligence
192(c)(3)	Vehicular manslaughter
192.5(a)	Vehicular manslaughter in the operation of a vessel while intoxicated
192.5(b)	Vehicular manslaughter in the operation of a vessel while intoxicated
192.5(c)	Vehicular manslaughter in the operation of a vessel
203	Mayhem
205	Aggravated Mayhem
206	Torture
207(a)	Kidnapping
207(b)	Kidnap -14 to com I&I
207(c)	Kidnapping by false pretense
207(d)	Kidnapping from outside the state
208(b)	Kidnap child under 14 yrs
209(a)	Kidnapping for ransom
209(b)(1)	Kidnap: commit rob/rape/etc
209.5(a)	Kidnap during carjacking
210.5	False imprisonment of a hostage
667.85	Kidnap to deprive parent
211	Robbery: first or second degree
212	Fear defined for robbery
212.5	Robbery; degrees
214	Train robbery
215	Carjacking
217.1(a)	Assault on a public official

217.1(b)	Attempted murder of a public official
218	Train wrecking; attempt; punishment.
218.1	Obstructing railroad track; punishment.
219	Train derailling or wrecking; punishment.
219.1	Throwing missile at common carrier with bodily harm
219.2	Throwing hard substance or shooting missile at train or other conveyance
220	Assault with intent to commit mayhem, rape, sodomy, oral copulation, or any violation of Section 264.1, 288, or 289
220(a)(1)	Assault with intent to commit a felony
220(a)(2)	Assault with intent to commit a felony-victim under 18
220(b)	Assault to commit a felony during the commission of a first degree burglary
222	Administering to another any chloroform, ether, laudanum, or any controlled substance, anesthetic, or intoxicating agent
236	False imprisonment
236.1	Human trafficking; provisions regarding minors; consideration of total circumstances
237(a)	False imprisonment
240	Assault
241	Assault
241.1	Assault on custodial officer
241.2	Assault on school or park property
241.3	Assault against person on public transportation, both on property of and within motor vehicle of provider
241.4	Assault on peace officer of a school district
241.5	Assault on a highway worker
241.6	Battery on school employee
241.7	Assault against jurors
241.8(a)	Battery against member of us armed forces
242	Battery
243	Battery
243.1	Battery on custodial officer
243.2(a)(1)	Battery on pers on school/park/grnds
243.25	Battery on an elder or dependent adult
243.3	Battery on transportation personnel/passenger
243.35	Battery on public transportation provider
243.4	Sexual battery
243.5(a)(1)	Assault or battery on school prop
243.6	Battery on school employee
243.65(a)	Battery against a highway worker
243.7	Battery against jurors
243.8(a)	Battery against a sports official
243.9(a)	Aggravated battery by gassing on peace officer or local detention facility employee
244	Aslt w/caustic chem/etc
244.5(b)	Assault with stun gun/taser
244.5(c)	Assault with stun gun or taser on peace officer or firefighter

245(a)(1)	Force/adw-not firearm: gbi
245(a)(2)	Aslt w/ firearm on person
245(a)(3)	Aslt w/machinegun on person
245(a)(4)	Force/adw not firearm: gbi
245(b)	Assault w/semiauto rifle
245(c)	Adw not f/arm: po/fire: gbi
245(d)(1)	Assault with a firearm upon a peace officer or firefighter
245(d)(2)	Assault on peaceofficer/firefighter with semiautomatic firearm
245(d)(3)	Machine gun/assault weapon on a peace officer/firefighter
245.2	Assault (adw/gbi) upon transportation personnel, mass transit personnel
245.3	Assault (adw/gbi) upon a custodial officer
245.5(a)	Adw/gbi schl emp: no f/arm
245.5(b)	Assault with firearm on a school employee
245.5(c)	Adw/stun gun or taser: school employee
245.6	Hazing resulting in death/serious bodily injury
246	Shoot: inhab dwell/veh/etc
246.3(a)	Firearm disch w/neg
246.3(b)	BB device disch w/ neg
261(a)	Rape
261.5(a)	Sex intercourse w/mnr -18
261.5(b)	Sex w/minor: + or - 3 yrs
261.5(c)	Sex w/minor:3+ yrs younger
261.5(d)	Sex w/minor: perp 21+ vic-16
262(a)(1)	Rape spouse by force/etc
262(a)(2)	Rape spouse und c/sub/etc
262(a)(3)	Rape: spouse uncon of act
262(a)(4)	Rape: spouse - threat to kidnap, inflict extreme pain, serious bodily injury
262(a)(5)	Rape: spouse - threat to incarcerate, arrest, deport
262(a)(6)	Rape of spouse by threat to arrest or deport
264.1	Rape/etc: cnrt force/viol
266a	Taking a person for prostitution
266b	Abduction to live in illicit relation; using force
266c	Unlawful sexual intercourse, sexual penetration, oral copulation, or sodomy; consent procured by false or fraudulent representation with intent to create fear
266h(b)	Pimping a minor
266i(b)	Pandering a minor
266j	Procurement of child under age 16 for lewd and lascivious acts
267	Abduction; person under 18 for purpose of prostitution
269(a)	Agg sex aslt: mnr: frce/etc
273.4	Female genital mutilation
273.5(a)	Injuring a spouse, cohabitant, fiancé, boyfriend, girlfriend or child's parent
273.5(f)	Inf crpl inj: sps/etc w/pr
273.6(b)	Viol crt ord to prev domes viol – results in physical injury
273.6(d)	Domestic violence w/prior – act of violence or a credible threat of violence
273a(a)	Willful cruel to child/poss inj/death

273a(b)	Willful cruelty to child
273ab(a)	Assault of child under 8 by force likely to produce GBI resulting in death
273ab(b)	Assault of child under 8 by force likely to produce GBI resulting in brain injury, paralysis
273d(a)	Inflict injury upon child
278	Child stealing
285	Incest
286(b)	Sodomy: person under 18
286(c)	Sodomy: person under 14
286(d)	Sodomy in concert w/force
286(f)	Sodomy: vict uncons of act
286(g)	Sodomy: vict incapbl:consent
286(h)	Sodomy: vic/def in mntl inst
286(i)	Sodomy: no ok: vict drugged
286(j)	Sodomy by impersonation
286(k)	Sodomy under color of authority
288(a)	Lewd or lasciv acts/w/child und 14yrs
288(b)	Lewd/lasc acts w/child under 14 or dependent person
288(c)	Lewd/lasc act w/chld 14/15:def 10yr+ or dependent person
288.2(a)	Harmful mtr sent w/int of seduc minor
288.3	Contact with intent to commit sex act
288.4	Arranging a meeting with minor for lewd purposes
288.5(a)	Continuous sexual abuse of child
288.7(a)	Sex/sodomy with a child under 10
288.7(b)	Oral copulation/sexual penetration with a child under 10
287(b)	Oral copulation w/pers und 18yrs
287(c)	Oral copul w/person und 14/by force
287(d)	Oral cop in concert: vic incap of con
287(f)	Oral cop: vic uncon/asleep
287(g)	Oral copulation of an incompetent person
287(h)	Oral cop: vic/def in mntl inst
287(i)	Oral copulation by anesthesia or controlled substance
287(j)	Oral copulation by impersonation
287(k)	Oral copulation under color of authority
288a(b)	Oral copulation w/pers und 18yrs
288a(c)	Oral copul w/person und 14/by force
288a(d)	Oral cop in concert: vic incap of con
288a(f)	Oral cop: vic uncon/asleep
288a(g)	Oral copulation of an incompetent person
288a(h)	Oral cop: vic/def in mntl inst
288a(i)	Oral copulation by anesthesia or controlled substance
288a(j)	Oral copulation by impersonation
288a(k)	Oral copulation under color of authority
289	Sexual pen with force/etc
289.6(a)(3)	Sex: emp/etc cnf/detention fac
311.4(a)	Using Minors for Sex Acts
311.4(b)	Using Minors for Commercial Sex Acts
311.4(c)	Using Minors for Sex Acts

347(a)	Poisoning, willful poison/etc food/etc
368(b)	Cause harm/death elder dep adult
368(c)	Elder/dependent adult cruelty
368(f)	False imprison: elder/dep adult violence
404(a)	Rioting
417(a)	Exhibit firearm or deadly weapon other than gun. Drawing, exhibiting, or using firearm or deadly weapon; self defense; peace officers.
417(b)	Exhibit firearm. Drawing, exhibiting, or using a firearm
417(c)	Exhibit firearm in presence of p.o. Drawing, exhibiting, or using firearm or deadly weapon; self defense; peace officers.
417.3	Exhibit firearm pres beh occup
417.8	Exhibit firearm/etc: resist arrest
422.6(a)	Violate civil rights by force or threat
451(a)	Arson causing great bodily injury
451(b)	Arson: inhabited structure/property
451.1	Arson with added circumstances
451.5(a)	Aggravated arson
452(a)	Causing fire that causes gbi
452(b)	Causing fire of inhabited struc/prop
455	Arson attempts and acts preliminary or in furtherance
646.9(a)	Stalking
646.9(b)	Stalking/temp restraining order
647.6(a)(1)	Annoy/molest child under 18yrs
647.6(b)	Annoy/molest child/ill entry of bldg
647.6(c)	Annoy/etc child -18 w/prior
667.61(d)(2)	Felony sex offenses; victim kidnapped increasing risk of harm
667.61(d)(3)	Felony sex offenses; victim tortured
667.61(e)(1)	Felony sex offense; victim kidnapped
667.61(e)(2)	Felony sex offenses during commission of burglary
667.61(e)(4)	Felony sex offenses against more than one victim
667.61(e)(5)	Felony sex offenses -tying or binding of victim or another person
667.8	Kidnap to commit sex offense
667.85	Kidnap child under 14 yrs
674	Sex offense by daycare provider
836.6(c)	Escape from custody by force or violence
4500	Assault by a life prisoner
4501	Assault by a state prisoner
4501.1(a)	Aggravated battery
4501.5	Battery on non-confined person by prisoner
4503	Holding of hostages; offense
4530(a)	Escape from custody by force and violence
4532(a)(2)	Escape from alternative custody by force or violence by person booked on misdemeanor
4532(b)(2)	Escape from alternative custody by force or violence by person booked on felony
11413(a)	terrorism by explosion
11413(b)	terrorism by explosion (specified places)
11418(b)	weapons of mass destruction: use and damage to life

11418(c)	weapons of mass destruction: use and damage to public natural resources
11418(d)	weapons of mass destruction: creation of new pathogens
18740	Use of destructive device and explosive to injure/destroy
18745	Explosion with intent to murder
18750	Explosion of destructive device causing bodily injury
18755	Explosion causing death, mayhem, GBI
26100(c)	Discharge of firearm at another person from motor vehicle
18540(a)	Use of firearm to intimidate a voter
664/187(a)	Attempted murder?
664/211	Attempted robbery
Veh Code 2800.3(a)	SBI caused by flight from peace officer
Veh Code 2800.3(b)	Death caused by flight from peace officer
<i>All attempts (PC 664), conspiracy (PC 182), solicitation (PC 653f), and accessory (PC 31) only if before the act of any of the offenses identified here also meet the definition of a violent offense for purposes of administering the PSA.</i>	

Tulare PSA AUC Race/Ethnicity Comparison

DeLong's test for two ROC curves

```
data: rocW_FTA and rocH_FTA
D = -2.3033, df = 537.38, p-value = 0.02164
alternative hypothesis: true difference in AUC is not equal to 0
sample estimates:
AUC of roc1 AUC of roc2
  0.511328   0.612143
```

DeLong's test for two ROC curves

```
data: rocW_newarrest and rocH_newarrest
D = -0.7973, df = 522.83, p-value = 0.4256
alternative hypothesis: true difference in AUC is not equal to 0
sample estimates:
AUC of roc1 AUC of roc2
  0.6583294  0.6894763
```

DeLong's test for two ROC curves

```
data: rocW_newfiling and rocH_newfiling
D = 0.48268, df = 603.45, p-value = 0.6295
alternative hypothesis: true difference in AUC is not equal to 0
sample estimates:
AUC of roc1 AUC of roc2
  0.6788764  0.6556996
```

DeLong's test for two ROC curves

```
data: rocW_newconviction and rocH_newconviction
D = 1.1924, df = 643.95, p-value = 0.2335
alternative hypothesis: true difference in AUC is not equal to 0
sample estimates:
AUC of roc1 AUC of roc2
  0.7257907  0.6667196
```

DeLong's test for two ROC curves

```
data: rocW_newviolent and rocH_newviolent
D = 0.05159, df = 488.63, p-value = 0.9589
alternative hypothesis: true difference in AUC is not equal to 0
sample estimates:
AUC of roc1 AUC of roc2
  0.6156526  0.6114719
```