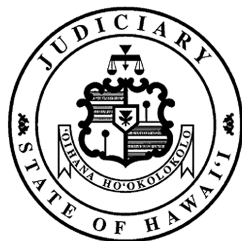


Interagency Council on Intermediate Sanctions



HAWAII STATE
DEPARTMENT
OF HEALTH

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Department of the Attorney General

State of Hawaii, 2009 – 2011 Reporting Period **Validation of LSI-R and ASUS Criminogenic Risk Instruments**

This study report is based on a compilation of adult offender risk assessment data from the CYZAP database, and offender arrest/conviction data from the Criminal Justice Information System (CJIS). The report contains detailed analyses of offenders from the Judiciary's Probation Services, Hawaii Paroling Authority, and the Department of Public Safety, who were administered the Level of Service Inventory Revised (LSI-R) and Adult Substance Use Survey (ASUS). These assessment instruments measure criminogenic and alcohol/drug dependency risk levels, as well as the severity of criminogenic and alcohol/drug patterns, known as subdomains. All offenders are classified by risk levels, which provide invaluable information needed for case supervision purposes and determining treatment levels. Both risk instruments are critical to risk and need principles established in evidence-based practices, and necessitate validation; e.g., ascertainment of whether or not they accurately predict recidivism, and if they correctly classify offenders into distinct risk groups. Recidivism is an important outcome measure, since it distinguishes offenders who have re-offended from those who remained free of crime or technical violations over a three-year period.

This report presents information on recidivism rates for probationers, parolees, and incarcerated offenders in the State of Hawaii. It also assesses a variety of offender conditions, including criminogenic dimensions, criminal offenses committed, and socio-demographic variables. The major objective of this report is to assist Interagency Council on Intermediate Sanctions (ICIS) agencies in evaluating longer-term outcomes, and documenting change in criminogenic risk patterns. It also provides analytical information on how a complement of predictive risk indicators, specified by risk levels, plays an important role in identifying risk assessment patterns, analyzing policy decisions, and evaluating service delivery options.

The statistical charts depicted herein present data relating to the following areas:

- (1) Recidivism Analysis
 - a. Agency and County
 - b. Socio-demographics
 - c. Time to Recidivism
 - d. LSI-R Risk classification validity
- (2) Analysis of LSI-R Initial and Most Recent Assessments
- (3) ASUS and LSI-R Predictive Validity

Methodology: The recidivism database includes an unduplicated count of 7,286 offenders, of which 5,126 received two or more LSI-Rs and ASUS' from 2009 through 2011. The approach of this report is to complement existing LSI-R and ASUS statistical profile information with offender arrest data. The recidivism database was prepared as a flat file of unduplicated offender records. Each record contains data fields that incorporate initial and most recent LSI-R and ASUS assessment information, criminal arrests, and types of charged offenses. Additionally, calculated fields were added to the database to measure change in both the LSI-R total and protective scores, and criminogenic subdomain percentiles. Furthermore, the use of calculated date fields, which measure the length of time between the start of follow-up date and arrest date, is critical for the measurement of recidivism. For the purpose of this report, recidivism is defined as rearrests, revocations, and technical violations, tracked over a three-year period from the onset of supervision or release to parole.

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This report is available electronically at the ICIS web site:
<hawaii.gov/icis>.

II. Recidivism Analysis - Socio-demographics

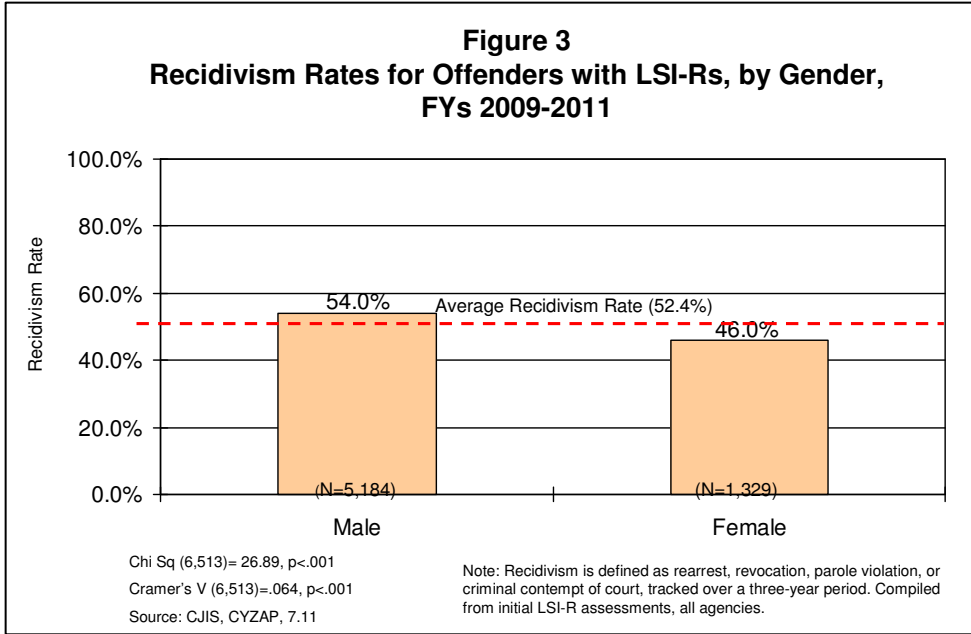


Figure 3 shows that male offenders recidivated at a significantly higher rate (54.0%) than did female offenders (46.0%) during the FYs 2009-2011 period.

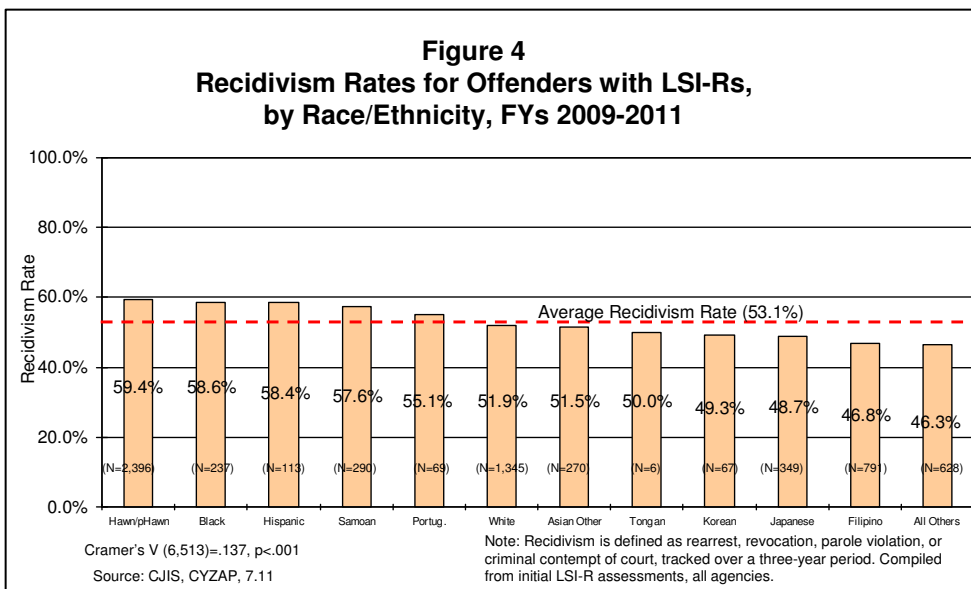


Figure 4 identifies recidivism rates for offenders with LSI-Rs, by race and ethnicity. The differences in offender recidivism rates are statistically significant (p<.001), whereby Hawaiian/part-Hawaiian (59.4%), Black (58.6%), and Hispanic (58.4%) groups had the highest recidivism rates.

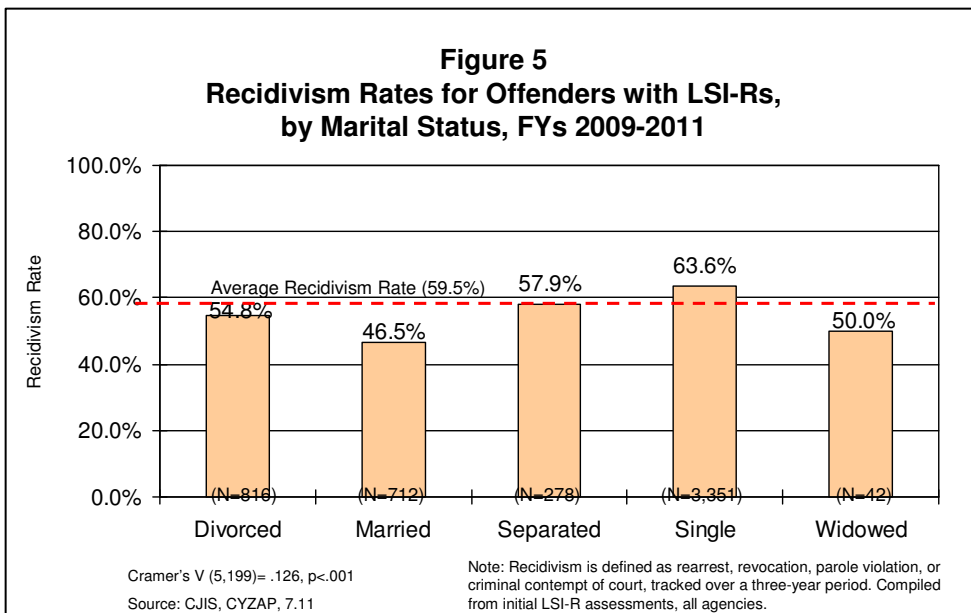


Figure 5 examines the recidivism rates for offenders with LSI-Rs, by marital status. The differences in recidivism rates are statistically significant (p<.001); Single offenders had the highest recidivism rate (63.6%), and Married (46.5%) and Widowed (50%) offenders had the lowest rates.

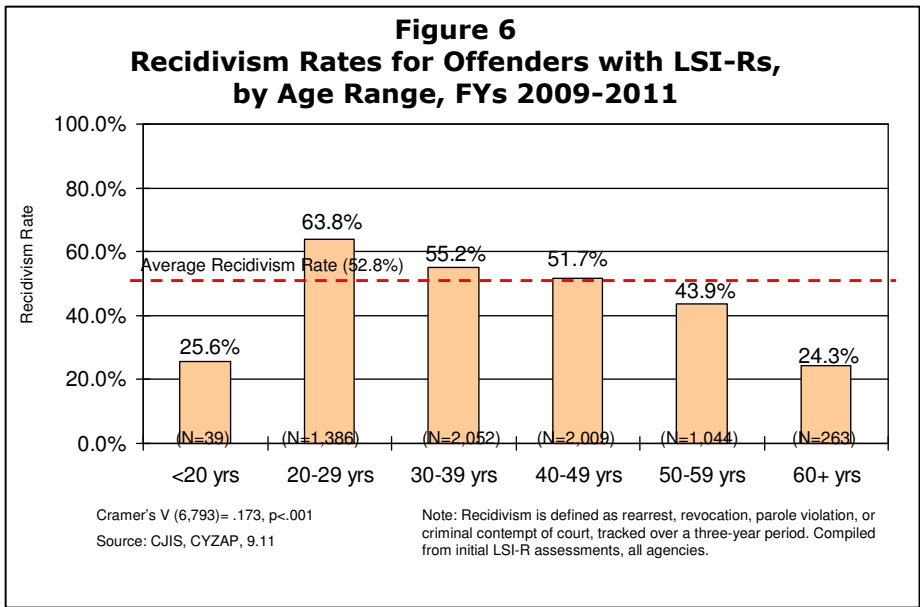


Figure 6 depicts the recidivism rates for offenders with LSI-Rs, by age range. The incremental decline in recidivism rates are statistically significant ($p < .001$) as offenders age, from a high of 63.8% for the 20-29 year-old age group, to a low of 24.3% for 60+ year-old offenders.

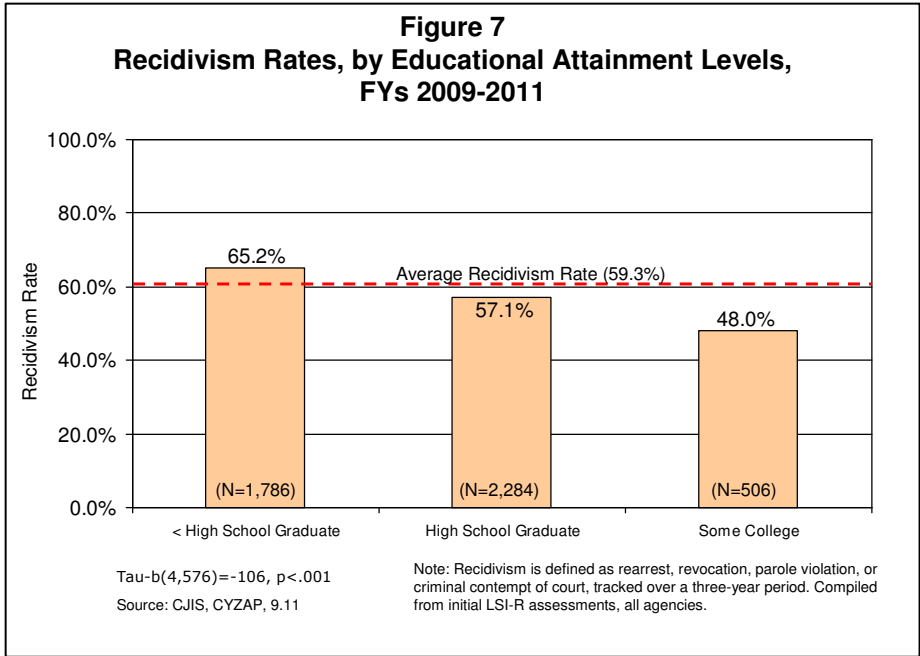


Figure 7 reveals the recidivism rates for offenders with LSI-Rs, by educational attainment levels. The consistent decline in recidivism rates, as educational attainment increases, are statistically significant ($p < .001$), beginning with offenders who fail to complete high school (65.2%), to offenders who have a high school diploma (57.1%), or those with some college education (48.0%).

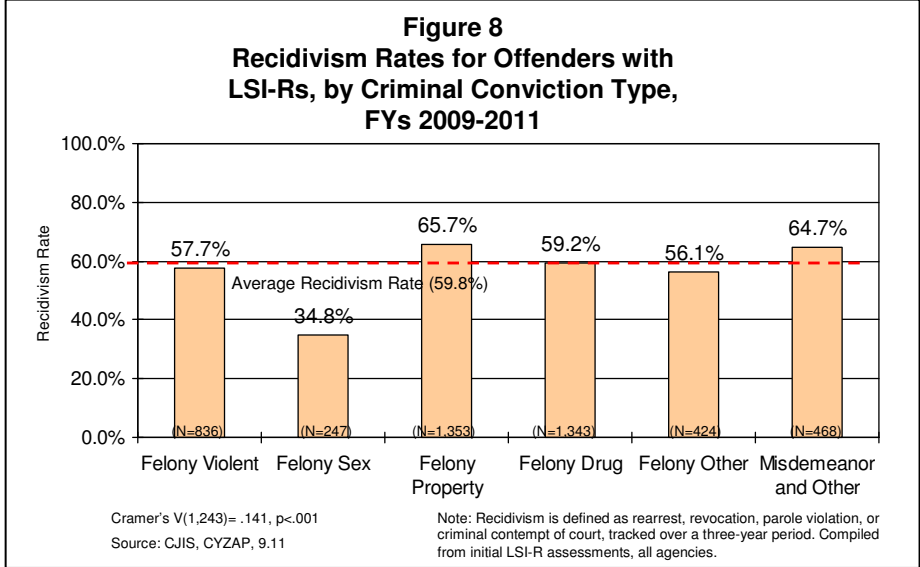


Figure 8 shows the recidivism rates of offenders with LSI-Rs, by criminal conviction type. The differences in recidivism rates are statistically significant ($p < .001$), whereby offenders convicted for Felony Property offenses had the highest recidivism rates (65.7%), followed by misdemeanor convictions (64.7%). Offenders convicted for Felony Sex offenses had the lowest recidivism rate (34.8%).

III. Recidivism Analysis – Time to Recidivism

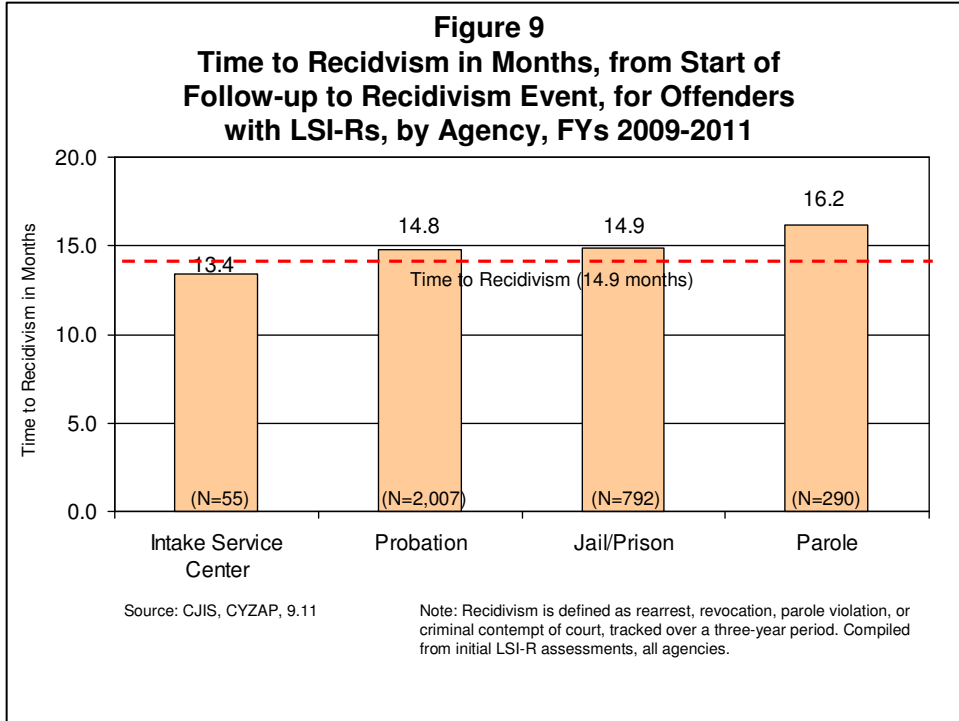


Figure 9 identifies, by agency, the time to recidivism in months, from the start of follow-up (disposition start date, release to parole date, or maximum-term release date) to rearrest or revocation date. The average time to recidivism was 14.9 months, although the differences in time to recidivism are not statistically significant across the multiple agencies.

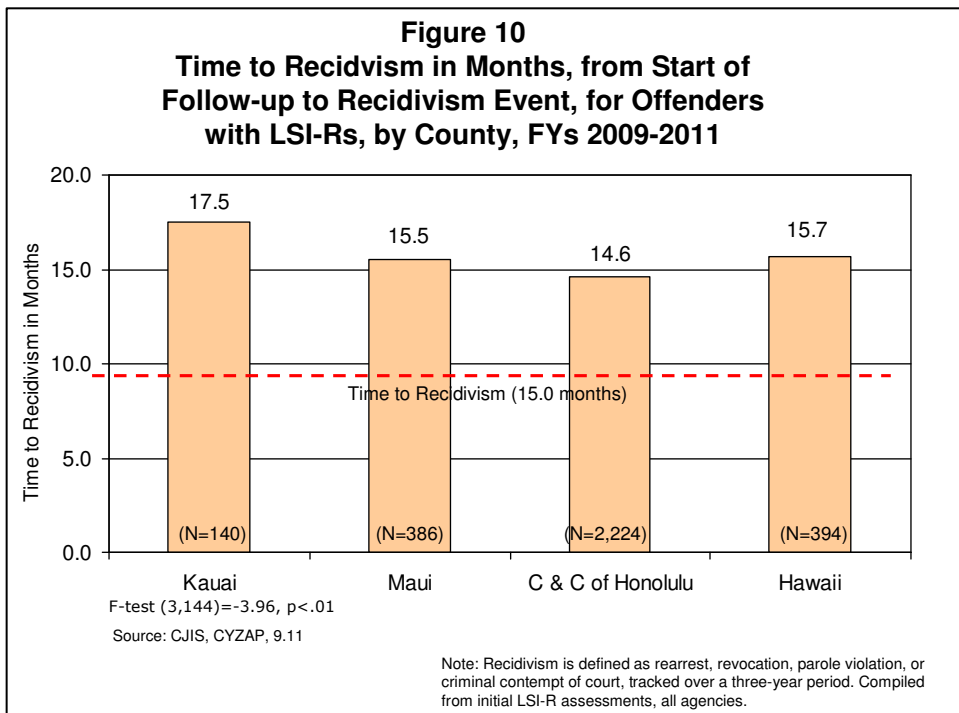


Figure 10 examines, by county, the time to recidivism in months, from the start of follow-up to the rearrest/revocation date. The average time to recidivism was 15.0 months. The differences in time to recidivism are statistically significant ($p < .001$) between individual counties, whereby Kauai County had the longest time to recidivism (17.5 months), as compared to the City and County of Honolulu, which had the shortest recidivism period (14.6 months).

IV. Compilation of LSI-R Initial and Most Recent Administered LSI-Rs

Figure 11
Initial and Most Recent Administered LSI-Rs, by Cut-off Scores, FYs 2009-2011

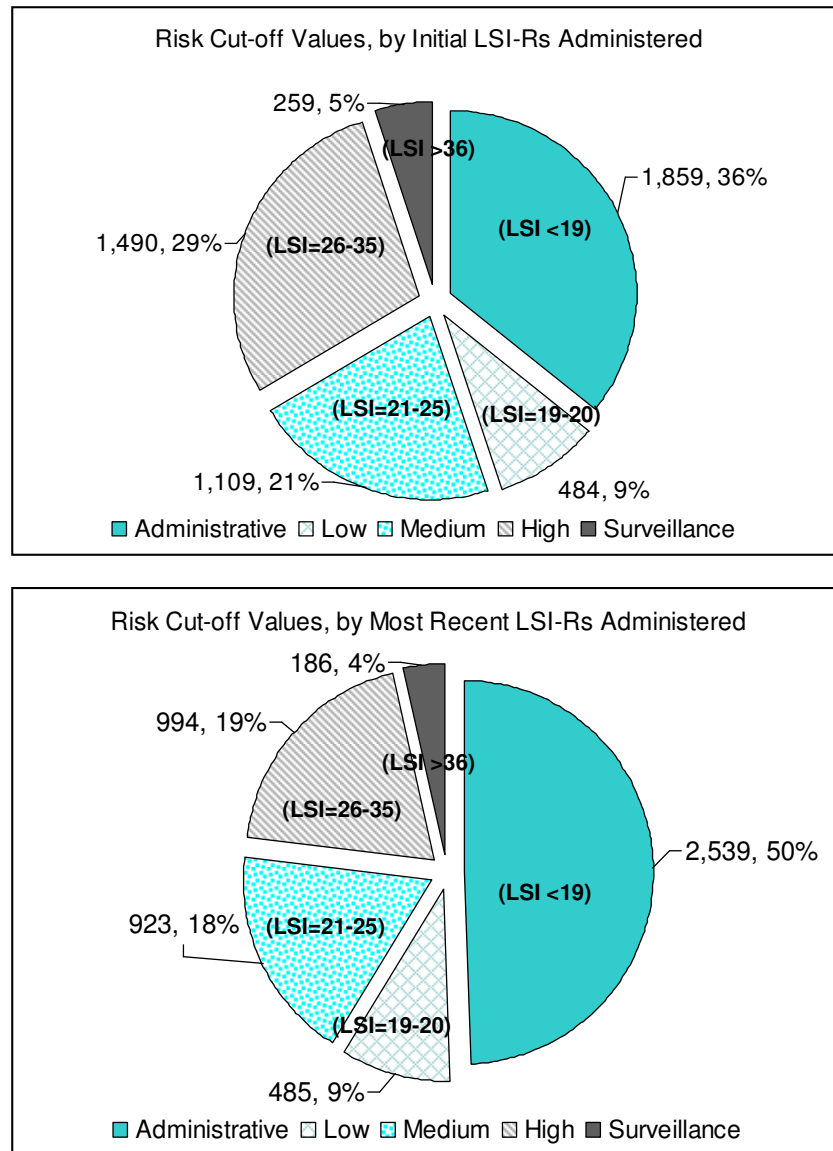


Figure 11 examines the initial and most recent administered LSI-Rs, by risk level cut-off values. At initial assessment, 36% of the offenders were at administrative risk, and 34% were at High-Surveillance risk; while at most recent assessments, 50% of offenders were at administrative risk, and 23% were at High-Surveillance risk. These pie charts reveal that offenders were generally at lower overall risk at the time of their most recent LSI-R assessments, as compared to their initial assessments.

V. Recidivism Analysis – LSI-R Risk Classification Validity

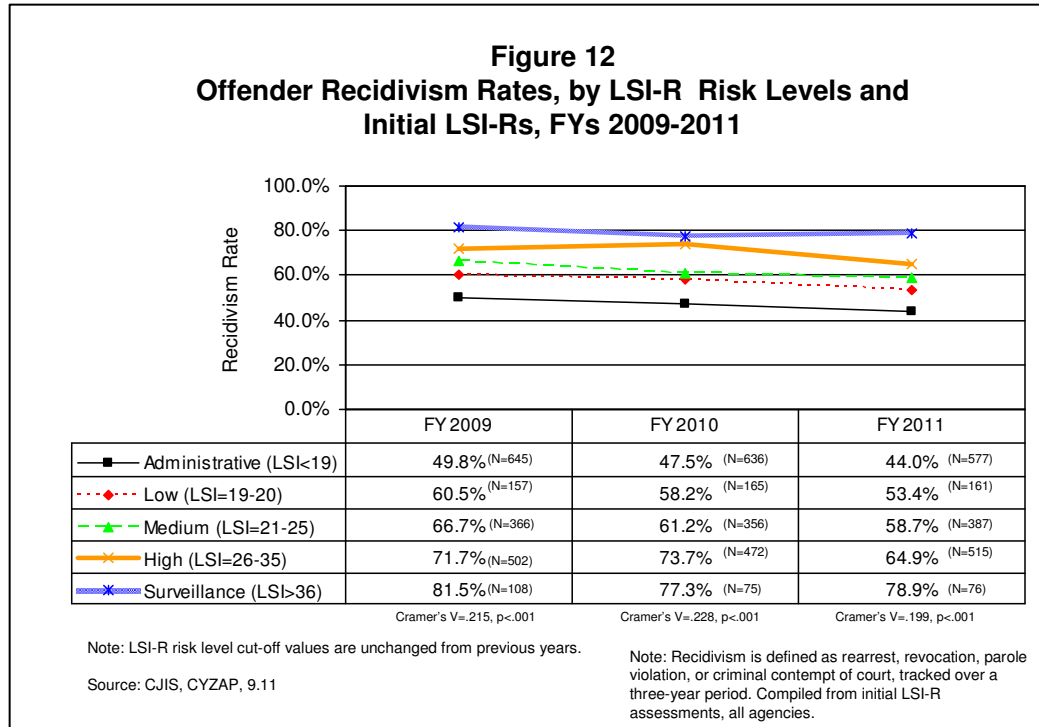


Figure 12 reveals risk-level recidivism rates for offenders with risk level cut-off scores, by initial LSI-Rs administered. The trends do not show statistically significant year-to-year differences in recidivism rates within each risk level, but there are significant differences in recidivism rates ($p<.001$) between risk levels, e.g., low high risk offenders, within fiscal years.

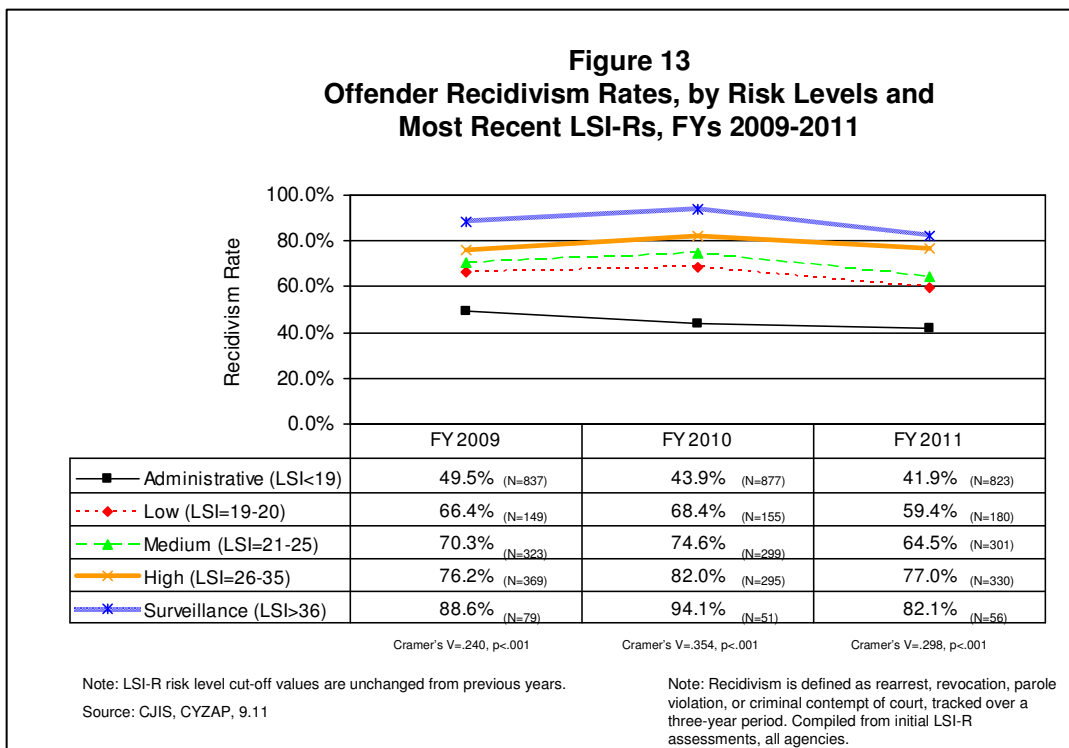


Figure 13 depicts the recidivism rates for offenders with risk level cut-off scores, by most recent LSI-Rs administered. The FYs 2009-2011 trends do not show statistically significant changes across years, but there are significant differences in recidivism rates ($p<.001$) between risk levels.

Figure 14
Average Total Risk and Protective Scores from
Initial and Most Recent LSI-R Assessments,
FYs 2009-2011

Offenders were at significantly lower recidivism risk on their most recent LSI-R assessments, as compared to their initial assessments.

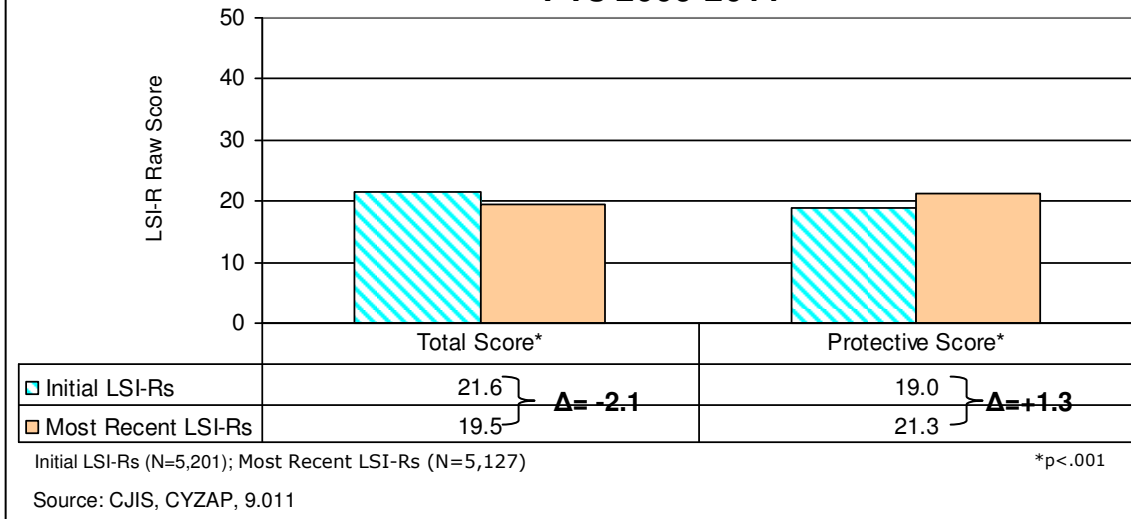


Figure 14 reveals change in the LSI-R total and protective scores, based on initial and most recent LSI-Rs administered to offenders. There is a statistically significant difference (p<.001) on their total and protective scores, whereby offenders had lower average total points (Δ=-2.1) and higher average protective points (Δ=+1.3) on their most recent assessments, as compared to their initial assessments.

Figure 15
Recidivism Rates for Offenders with Initial and
Most Recent LSI-R Assessments, by
Recommended Treatment Levels, FYs 2009-2011

Offenders with Recommended Treatment Levels (RTLs) derived from the LSI-R and ASUS disrupt scores, showed accurate recidivism risk prediction.

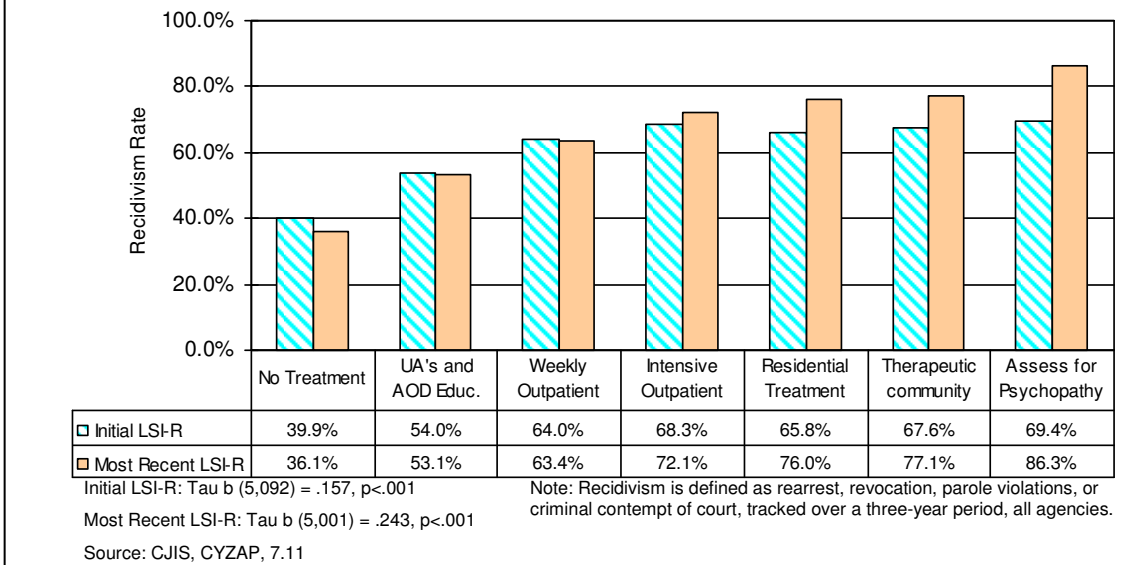


Figure 15 depicts recidivism rates for offenders classified by Recommended Treatment Levels (RTLs) in FYs 2009-2011. The RTL is based on six, increasingly intensive treatment regimens, each determined by cut-off ranges scored incrementally from the LSI-R total score and ASUS disrupt score. There is a statistically significant difference (p<.001) between the six RTL categories at the initial and most recent assessment. The RTLs have statistically significant predictive validity, especially for most recent assessments, which have stronger statistical associations with recidivism (Tau b=.243), than do initial assessments (Tau b=.157).

Figure 16
Average Subdomain Percentiles from Initial and Most Recent
LSI-R Assessments, FYs 2009-2011

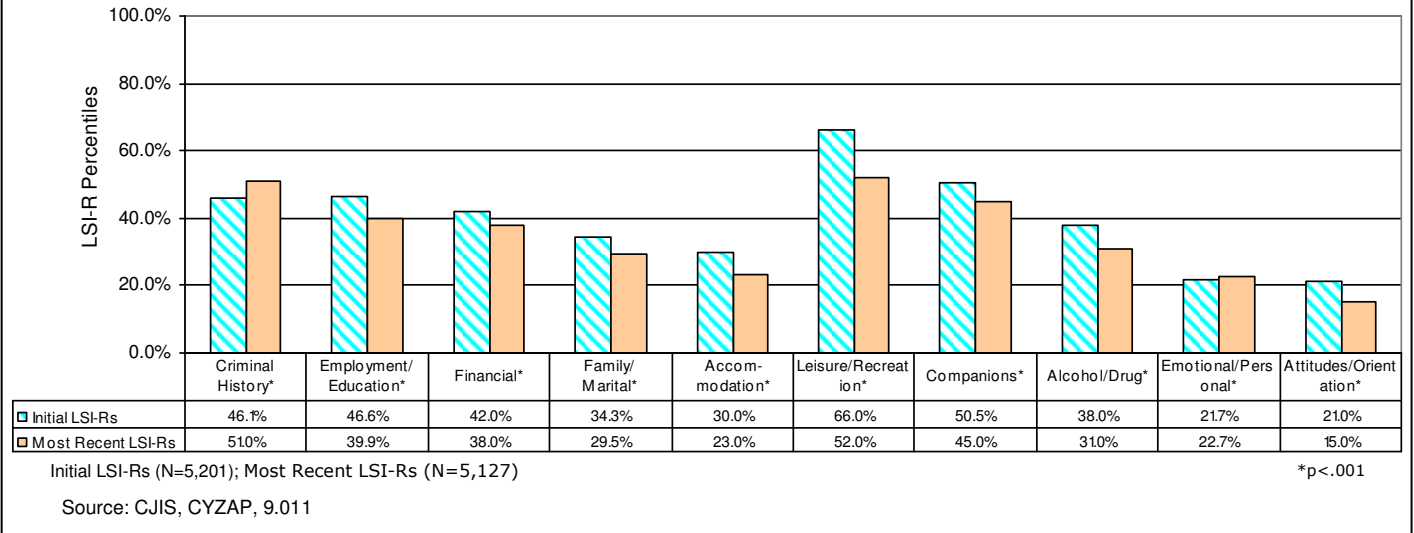


Figure 16 shows the percentile change in LSI-R subdomains for initial and most recent assessments in FYs 2009-2011. All ten subdomains have statistically significant, negative (i.e., reduction in risk) percentile change, except for Criminal History ($\Delta=+4.9\%$), and Emotional/Personal ($\Delta=+1.0\%$). Leisure ($\Delta=-14.0\%$) had the largest percentile decline in recidivism risk, from 66% to 52% after reassessment.

Figure 17
Average Subdomain Percentiles from Initial and Most Recent
ASUS Assessments, FYs 2009-2011

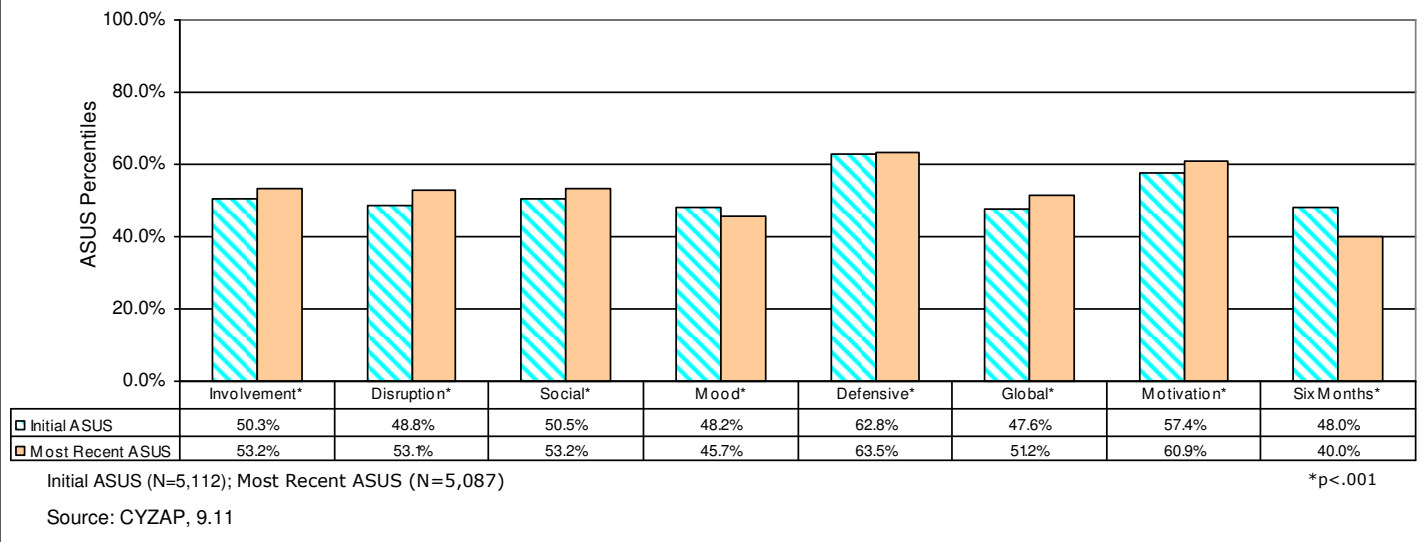
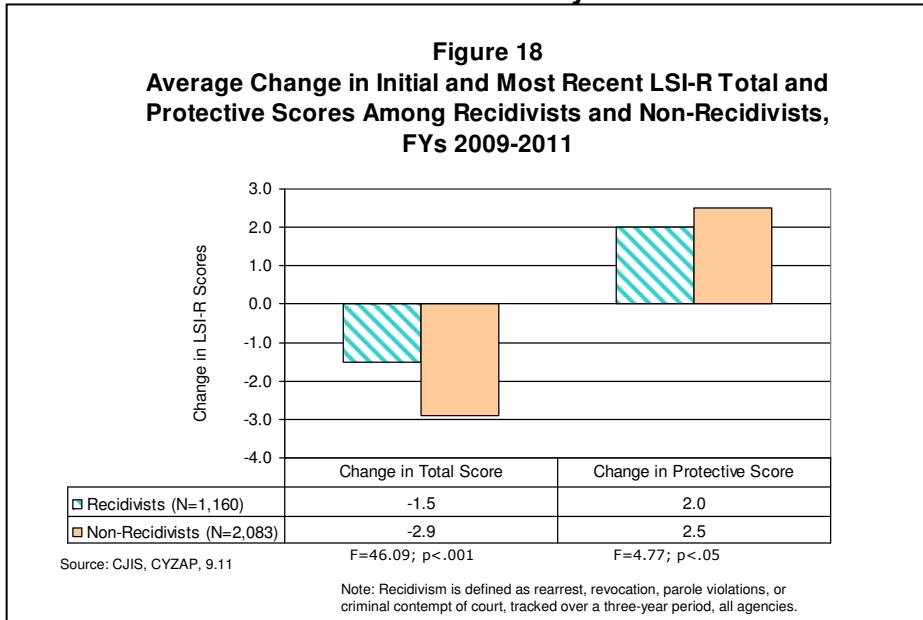


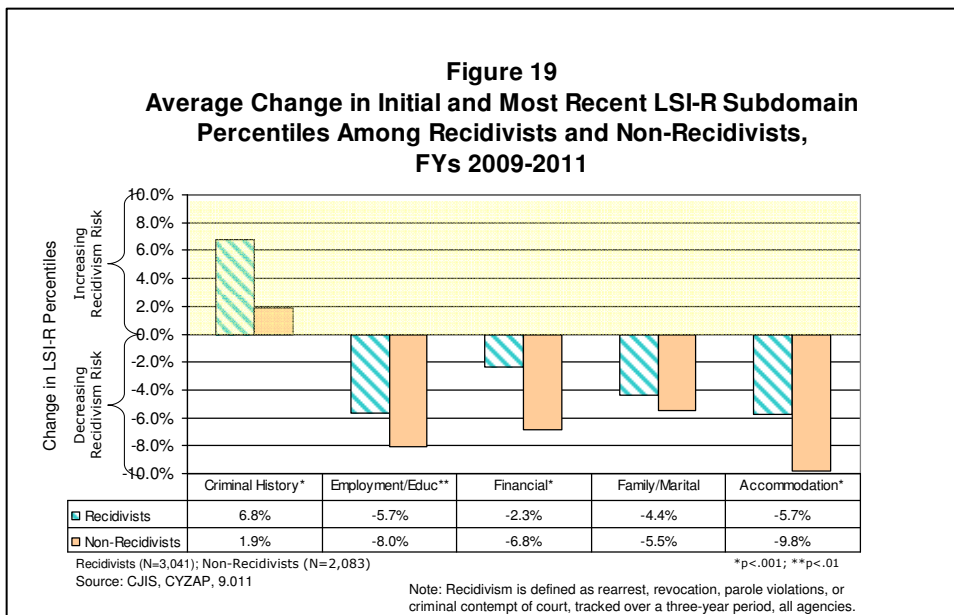
Figure 17 identifies the percentile change in ASUS subdomains for initial and most recent assessments in FYs 2009-2011. All eight subdomains have statistically significant percentile change, however, Involvement ($\Delta=+2.9\%$), Disruption ($\Delta=+4.3\%$), Social ($\Delta=+2.7\%$), Defensive ($\Delta=+.07\%$), Global ($\Delta=+3.6\%$), and Motivation ($\Delta=+3.5\%$) revealed higher ASUS risk percentiles. Only Mood ($\Delta=-2.5\%$) and past six month substance use ($\Delta=-8.0\%$) show significant declines in substance use risk.

VI. ASUS and LSI-R Predictive Validity



The LSI-R Total and Protective scores have good predictive validity.

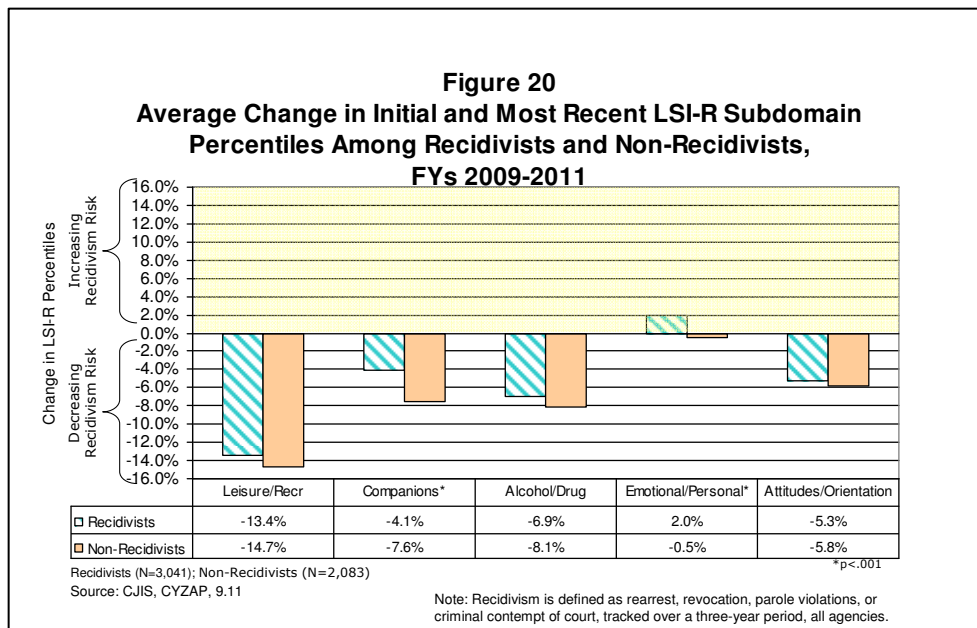
Figure 18 reveals the change in initial and most recent LSI-R Total and Protective scores for recidivists and non-recidivists in FYs 2009-2011. Recidivists had a smaller decline in Total scores after reassessment, as compared to non-recidivists, resulting in a significant ($p<.001$) difference in Total score ($\Delta=1.4$). Additionally, recidivists had a smaller increase in Protective scores after reassessment, as compared to non-recidivists, resulting in a significant ($p<.01$) difference in protective score ($\Delta=0.5$).



The LSI-R subdomains of Employment/Education, Financial, and Accommodation have good predictive validity.

Figure 19 depicts the percentile change in initial and most recent LSI-R subdomains for recidivists and non-recidivists in FYs 2009-2011. Recidivists (inherent by definition) had a larger increase in Criminal History percentiles after reassessment, as compared to non-recidivists, resulting in a statistically significant ($p<.001$) difference in percentile score ($\Delta=4.9$). Non-recidivists, as opposed to recidivists, had a larger decline in percentiles after reassessment. The greatest subdomain differences in percentiles between non-recidivists and recidivists were Financial ($\Delta=4.5$), Accommodation ($\Delta=4.1$), and Employment/Education ($\Delta=2.3$).

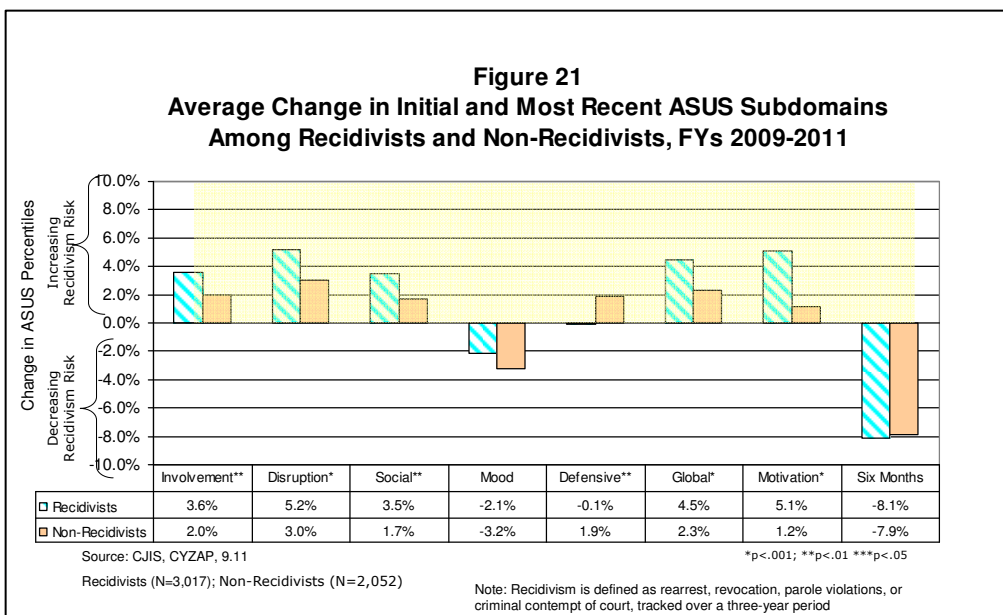
Note: The greater the negative change in Employment/Educ, Financial, and Accommodation percentiles, the lower the risk for recidivism.



The LSI-R subdomains of Companions and Emotional/Personal have good predictive validity.

Figure 20 shows the percentile change in initial and most recent LSI-R subdomains for recidivists and non-recidivists in FYs 2009-2011. Recidivists had a larger increase in Emotional/Personal percentiles after reassessment, as compared to non-recidivists, resulting in a statistically significant ($p<.001$) difference in percentile scores ($\Delta=2.5$). The greatest subdomain difference in percentiles between non-recidivists and recidivists was Companions ($\Delta=3.5$).

Note: The greater the negative change in Leisure/Recreation, Companions, and Emotional/Personal percentiles, the lower the risk for recidivism.



The ASUS subdomains of Involvement, Disruption, Social, Defensive, Global, and Motivation ASUS subdomains have good predictive validity.

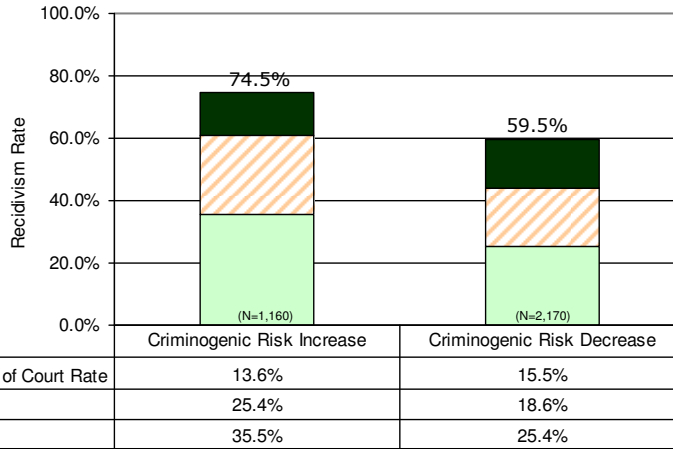
Figure 21 examines the percentile change in initial and most recent ASUS subdomains for recidivists and non-recidivists in FYs 2009-2011. Recidivists had a larger increase in Motivation scores after reassessment, as compared to non-recidivists, resulting in a significant ($p<.001$) difference in percentile scores ($\Delta=3.9\%$). Recidivists showed a larger increase in percentiles after reassessment, as compared to non-recidivists, resulting in significant differences for the following subdomains: Disruption ($\Delta=2.2\%$, $p<.001$), Global ($\Delta=2.2\%$, $p<.001$), and Social ($\Delta=1.8\%$, $p<.01$).

Note: The greater the negative change in Mood, and Six Months percentiles, the lower the risk for recidivism.

Figure 22
Types of Recidivism for Offenders with Increased and Decreased Criminogenic Risks¹, FYs 2009-2011

Recidivism Rates

•Offenders with Increasing LSI-R Total Score after Reassessment: **74.5%** Recidivism Rate
Offenders with Decreasing LSI-R Total Score after Reassessment: **59.5%** Recidivism Rate



¹Criminogenic risk increase is defined as offenders with higher LSI-R Total scores, after reassessment, while Criminogenic Risk Decrease represents offenders with lower LSI-R Total scores, after reassessment.
Phi (3,330) = .168, p < .001

Recidivists (N=2,157); Non-Recidivists (N=1,173)

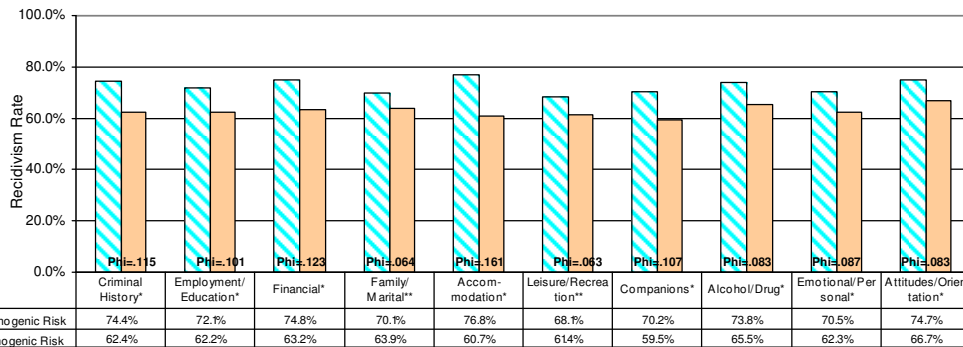
Source: CJIS, CYZAP, 9.11

Note: Recidivism is defined as rearrest, revocation, parole violation, or criminal contempt of court, tracked over a three-year period, all agencies.

The LSI-R has good predictive validity due to the differences in recidivism rates between offenders with increasing criminogenic risk, versus offenders at reduced risk over time.

Figure 22 presents the recidivism rates for offenders with increased criminogenic risks (higher LSI-R Total scores at reassessment) and decreased risk (lower LSI-R Total scores at reassessment) in FYs 2009-2011. Regardless of types of recidivism (i.e., rearrests, revocation, and criminal contempt of court), recidivism rates are significantly higher for offenders with criminogenic risk increase (74.5% overall), as compared to offenders with criminogenic risk decrease (59.5% overall).

Figure 23
Average Recidivism Rates, by LSI-R Subdomains for Offenders with Higher and Lower Criminogenic Risk¹ After Reassessment, FYs 2009-2011



¹Higher criminogenic risk is defined as offenders with higher LSI-R subdomain percentiles, after reassessment, while Lower criminogenic risk is defined as offenders with lower subdomain percentiles, after reassessment.

*p < .001; **p < .01

Recidivists (N=2,157); Non-Recidivists (N=1,173)
Source: CJIS, CYZAP, 9.011

Note: Recidivism is defined as rearrest, revocation, parole violations, or criminal contempt of court, tracked over a three-year period

The LSI-R subdomains have good predictive validity due to the differences in recidivism rates between offenders at higher criminogenic risk, versus offenders at reduced risk over time.

Figure 23 examines recidivism rates for offenders with increased criminogenic risk (higher LSI-R subdomain scores after reassessment) and decreased risk (lower subdomain scores after reassessment) in FYs 2009-2011. The recidivism rates for all ten of the LSI-R subdomains are significantly higher for offenders with higher criminogenic risk, as compared to offenders at reduced risk.

Figure 24
Predictive Validity of LSI-R Total Scores, by Initial and
Most Recent LSI-R Assessments

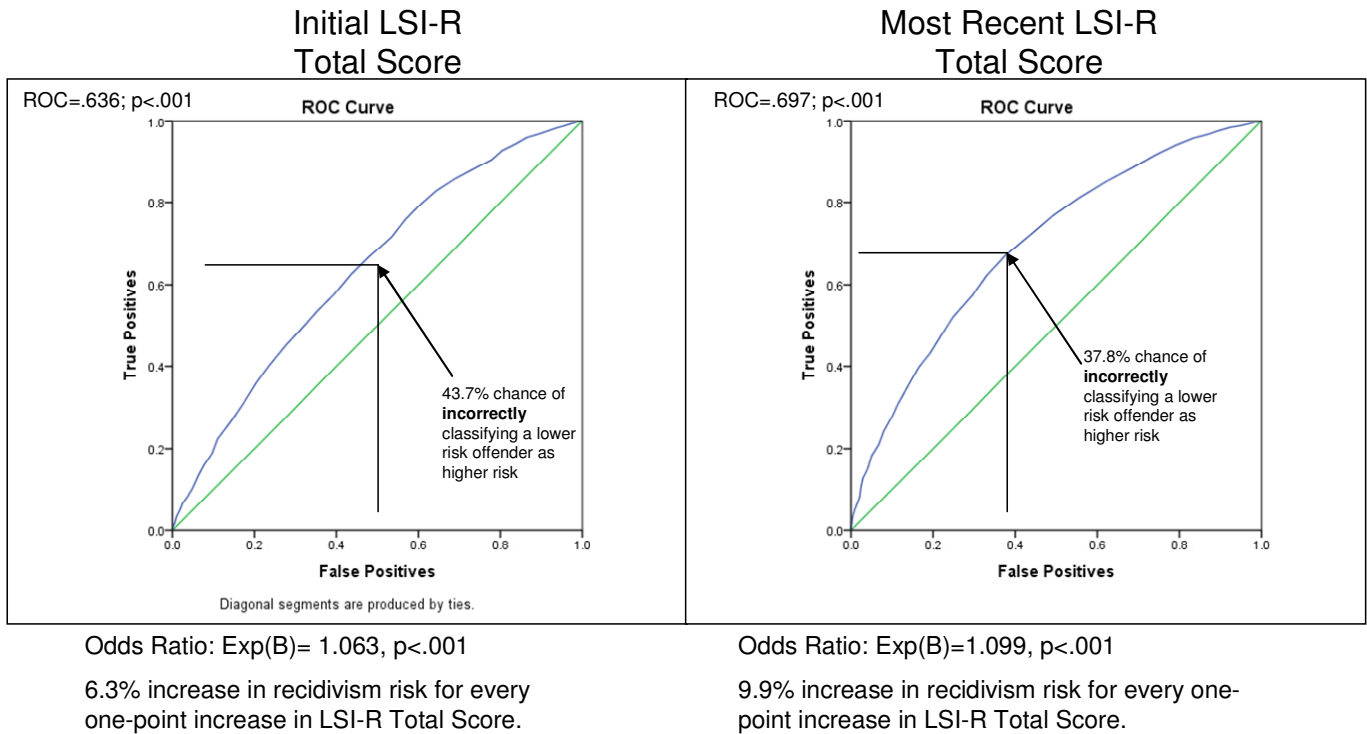


Figure 24 graphically depicts the predictive validity of the LSI-R, as a criminogenic risk assessment instrument. The Receiver Operator Characteristics (ROC) coefficient is a statistical measure (see technical notes on ROCs; p.21) used to predict the instrument’s ability to correctly classify offenders, based on Total scores and recidivism. The differences between initial and most recent LSI-R Total scores have statistically significant ($p<.001$), and predictive ROC values of .636 and .697, respectively.

This figure also depicts odds ratios (relative risk probabilities) for reassessed offenders (see technical notes on regression analysis; p. 21). With respect to changes observed in the Initial LSI-R Total score, a positive change in Total score reveals 6.3% greater odds of recidivism, relative to offenders who show no change in LSI-R Total scores ($\text{Exp}(B)=1.063; p<.001$). Additionally, a positive change in the most recent LSI-R Total score results in a 9.9% greater odds of recidivism, relative to offenders who show no change in LSI-R Total score ($\text{Exp}(B)=1.099 ; p<.01$). Simply put, offenders whose assessment scores improve over time are significantly less likely to recidivate, relative to offenders whose assessment scores show a worsening condition.

Table 1
Measures of Predictive Validity Between LSI-R Subdomain Percentiles and Recidivism Risk, FYs 2009-2011

	Criminal History	Education Employment	Financial	Family Marital	Accommodation
ROC	.587**	.524**	.525**	Not sig.	.529*
Exp (B)	11.29*	1.41*	1.31*	Not sig.	.145*
Odds Ratio¹	129% greater odds of recidivism	41% greater odds of recidivism	31% greater odds of recidivism	Not sig.	45% greater odds of recidivism

	Leisure Recreation	Companion	Alcohol Drug	Emotional Personal	Attitude Orientation
ROC	Not sig.	.528**	.Not sig.	.530*	Not sig.
Exp (B)	Not sig.	.1.50*	Not sig.	1.69*	Not sig.
Odds Ratio¹	Not sig.	50% greater odds of recidivism	Not sig.	69% greater odds of recidivism	Not sig.

¹For every percentile increase/decrease in LSI subdomains, there is a corresponding increase/decrease in the odds of recidivism.
 *p<.001; **p<.01; ***p<.05

Table 1 shows two measures of the predictive validity (ROC, Odds Ratio) of observed changes in the LSI-R subdomain scores after reassessment, and subdomain effect on re-arrest recidivism (see technical notes on ROCs; p.21). Of the ten subdomains, four did not reveal predictive validity (Family/Marital, Leisure/Recreation, Alcohol/Drug, and Attitude/Orientation).

The Criminal History subdomain revealed the greatest predictive validity (ROC=.587, Odds Ratio (OR)=11.29), or a 129% increase in recidivism risk, for every percentile increase in criminal history (see note). The Emotional/Personal subdomain also revealed good predictive validity (ROC=.530, OR=1.69, or a 69% increase in recidivism risk for every percentile increase. Predictive validity was also found for the subdomains; Companion (OR=1.50), Accommodation, (OR=1.45), Education/Employment (OR=1.41), and Financial (OR=1.31).

Note: The Criminal History subdomain is essentially a scale that measures criminal offenses, which in itself is a proxy measure for recidivism (i.e., reoffending behavior).

Table 2
Correlation Analysis of Offenders with Most Recent LSI-R Total and
Protect Scores and Subdomain Percentiles, Including Rearrest Rates,
FYs 2009-2011

	Rearrest	Total Score	Protect Score	Criminal History	Education/ Employment	Financial	Family/ Marital	Accommodation	Leisure/ Recreation	Companions	Alcohol/ Drug	Emotional/ Personal	Attitudes/ Orientation
Rearrest		.331**	-.197**	.264**	.232**	.158**	.103**	.172**	.125**	.190**	.187**	.080**	.153**
Total Score	.331**		-.673**	.513**	.723**	.472**	.468**	.531**	.461**	.557**	.636**	.399**	.505**
Protect Score	-.197**	-.673**		-.099**	-.615**	-.431**	-.391**	-.368**	-.442**	-.252**	-.438**	-.260**	-.434**
Criminal History	.264**	.513**	-.099**		.194**	.050**	.121**	.192**	not sig.	.251**	.161**	.059**	.129**
Education/ Employment	.232**	.723**	-.615**	.194**		.382**	.221**	.298**	.334**	.276**	.327**	.167**	.255**
Financial	.158**	.472**	-.431**	.050**	.382**		.235**	.172**	.246**	.076**	.237**	.318**	.215**
Family/ Marital	.103**	.468**	-.391**	.121**	.221**	.235**		.244**	.196**	.205**	.217**	.209**	.236**
Accommodation	.172**	.531**	-.368**	.192**	.298**	.172**	.244**		.242**	.345**	.295**	.134**	.260**
Leisure Recre- ation	.125**	.461**	-.442**	not sig.	.334**	.246**	.196**	.242**		.217**	.259**	.116**	.325**
Companions	.190**	.557**	-.252**	.251**	.276**	.076**	.205**	.345**	.217**		.298**	.070**	.253**
Alcohol Drugs	.187**	.636**	-.438**	.161**	.327**	.237**	.217**	.295**	.259**	.298**		.177**	.256**
Emotional Personal	.080**	.399**	-.260**	.059**	.167**	.318**	.209**	.134**	.116**	.070**	.177**		.155**
Attitudes Ori- entation	.153**	.505**	-.434**	.129**	.255**	.215**	.236**	.260**	.325**	.253**	.256**	.155**	

N=5,124

**p<.01

Table 2 identifies the correlations between most recent LSI-R Total score, Protect score, and subdomain percentiles, and their association with rearrests. Two variables that have strong statistical association with each other will have a correlation coefficient that approaches 1.0, while a weak association will have a correlation coefficient that approaches zero (see technical notes on correlation analysis; p.21). The LSI-R total and protect scores, as well as all ten subdomains, are statistically associated with rearrest. The strongest statistical relationship (r=.331) was between total score and rearrest; whereby as LSI-R Total scores increase, the risk of rearrest also increases. Similarly, as LSI-R Protect scores increase, the risk of rearrest decreases. With respect to five of the top subdomains, increases in Criminal History (r=.264), Education/Employment (r=.232), Companions (r=.190), Alcohol/Drugs (r=.187), and Accommodation (r=.172) are each significantly correlated (p<.01) with an increase in rearrest rates.

Table 3
Correlation Analysis of Offenders with Most Recent ASUS
Subdomains, Including Rearrest Rates, FYs 2009-2011

Correlations with Rearrests and the Most Recent ASUS Domains (N=5,105)

	Rearrest	Involvement	Disruption	Social	Mood	Defensive	Global	Motivation
Rearrest		.074**	.040**	.119**	.031*	not sig.	.070**	.063**
Involvement	.074**		.674**	.467**	.308**	-.351**	.787**	.471**
Disruption	.040**	.674**		.513**	.473**	-.468**	.925**	.488**
Social	.119**	.467**	.513**		.421**	-.515**	.694**	.285**
Mood	.031*	.308**	.473**	.421**		-.665**	.621**	.243**
Defensive	not sig.	-.351**	-.468**	-.515**	-.665**		-.585**	-.251**
Global	.070**	.787**	.925**	.694**	.621**	-.585**		.493**
Motivation	.063**	.471**	.488**	.285**	.243**	-.251**	.493**	

N=5,105

* p<.05,
**p<.01

Table 3 examines the correlations between the most recent ASUS subdomain percentiles and the strength of their individual statistical association with rearrest (see technical notes on correlation analysis; p.21). With respect to five of the top subdomains, increases in Social (r=.119), Involvement (r=.074), Global (r=.070), and Motivation (r=.063) are each significantly correlated (p<.01) with an increase in rearrest rates

Table 4
Correlation Analysis of Offenders with Most Recent LSI-R Scores and
Subdomains, Specified by ASUS Subdomains, FYs 2009-2011

Correlations Among ASUS and LSI-R Scales (N=5,094)

LSI-R Subdomains	ASUS Subdomains						
	Involvement	Disruption	Social	Mood	Defensive	Global	Motivation
Total Score	.337**	.294**	.320**	.273**	-.205**	.365**	.248**
Protect Score	-.149**	-.116**	-.116**	.219**	.137**	-.165**	-.079**
Criminal History	.278**	0.241	.331**	.068**	-.098**	.285**	.240**
Education and Employment	.156**	.127**	.223**	.165**	-.121**	.186**	.115**
Financial	.125**	.143**	.081**	.214**	-.138**	.169**	.069**
Family/ Marital	.122**	.114**	.127**	.179**	-.131**	.157**	.043**
Accommodation	.102**	.077**	.058**	.102**	-.065**	.098**	.104**
Leisure Recreation	not sig.	not sig.	.035*	.091**	-.047**	not sig.	not sig.
Companions	.222**	.185**	.190**	.090**	.086**	.213**	.215**
Alcohol Drugs	.352**	.293**	.206**	.214**	.169**	.327**	.304**
Emotional Personal	.127**	.181**	.074**	.293**	-.168	.210**	not sig.
Attitudes Ori-entation	.037**	not sig.	.074**	.077**	-.029*	.046**	.029*

N=5,094

* p<.05,
 **p<.01

Table 4 reveals the correlations between the LSI-R and ASUS subdomains. The LSI-R Alcohol/Drug subdomain demonstrates statistically significant (p<.01) correlations with the ASUS subdomains of Involvement (r=.352), Global (r=.327), and Motivation (r=.304). The LSI-R Total Score also has significant correlations with the ASUS subdomains of Global (r=.365), Involvement (r=.337), and Social (r=.320).

Summary

The following summary results are from analyses of 7,286 offenders who were administered the LSI-R/ASUS:

- Probation's recidivism rate had the greatest decline of 7.6 percentage points from FYs 2009-2011, as compared to other agencies.
- Hawaii County, had the highest recidivism rate (63.2%) in FY 2011, as compared to other counties. Hawaii County's recidivism rate in FY 2011 marks a 13.5 percentage-point increase from FY 2009.
- The City and County of Honolulu's recidivism rate had the greatest decline at 10.3 percentage points during FYs 2009-2011, as compared to other counties.
- Offenders initially convicted of property offenses have the highest recidivism rate (65.7%).

Recidivism rates are highest for:

- Gender - Males (54.0%)
- Race or Ethnicity – Hawaiian/part-Hawaiian offenders (59.4%)
- Marital Status - Offenders who are Single (63.6%).
- Age Range - Offenders between 20-29 years old (63.8%).
- Education Attainment – Offenders who did not complete high school (65.2%).

LSI-R findings:

- The current LSI-R risk levels for both initial and most recent assessments demonstrate predictive validity (for FYs 2009-2011), based on statistically significant differences in recidivism rates from administrative (47.2%) through surveillance levels (79.5%) of risk.
- The proportion of administrative-level offenders increased to 50% for most recent assessments, as compared to 34% of offenders at initial assessment.
- The average Total score decreased by 2.1 points, while average protective scores increased 2.3 points after reassessment.
- There is evidence of reduced offender criminogenic risk patterns among non-recidivists, as compared to recidivists, with an average change in total score (-1.4 points) and protective score (+0.5 points), after reassessment.
- Offenders with increasing criminogenic risks (higher LSI-R total scores) have a 74.5% average recidivism rate; as compared to 59.5% for offenders with decreasing criminogenic risks (lower LSI-R total scores).

Evidence of LSI-R subdomains' predictive validity:

- For each of the ten LSI-R subdomains, offenders who were reassessed with higher criminogenic risk patterns had higher recidivism rates, as compared to offenders with lower risk patterns.
- Offenders who are non-recidivists, as compared to recidivists, reveal significant decline in percentile scores on seven out of ten LSI-R subdomains after reassessment. The greatest subdomain difference in percentiles between non-recidivists and recidivists is Financial ($\Delta=4.5\%$), Accommodation ($\Delta=4.1\%$), and Emotional/Personal ($\Delta=2.5\%$).

Evidence of ASUS subdomains' predictive validity:

- Offenders who are non-recidivists, as compared to recidivists, reveal significant decline in percentile scores on six out of eight ASUS subdomains after reassessment. The greatest subdomain difference in percentiles between non-recidivists and recidivists is Motivation ($\Delta=3.9\%$), Disruption ($\Delta=2.2\%$), Global ($\Delta=2.2\%$), Social ($\Delta=1.8\%$), and Involvement ($\Delta=1.6\%$).

The following findings describe the predictive validity of the LSI-R:

- The initial (ROC=.636) and most recent (ROC=.697) assessments have high predictive validity, regarding the sensitivity of the LSI-R to accurately classify offenders by risk levels.
- A one-point increase in the LSI-R total score results in a 10% increase in recidivism risk.
- A one-percentile increase in Emotional/Personal, after reassessment, results in a 69% increase in recidivism risk.

Correlation strength between recidivism and the LSI-R and ASUS:

- The most recent LSI-R total score is significantly associated with offender recidivism ($r=.331$); followed by correlations with offender percentile scores in Criminal History ($r=.264$), Education/Employment ($r=.232$), Companions ($r=.190$), Alcohol/Drugs ($r=.187$), and Accommodations ($r=.172$).
- The most recent ASUS Social subdomain is significantly associated with offender recidivism ($r=.119$); followed by correlations with Involvement ($r=.074$), Global ($r=.070$), and Motivation ($r=.063$).
- The most recent LSI-R total score is correlated with the following ASUS subdomains; Global ($r=.365$), Involvement ($r=.337$), and Social ($r=.320$).

Conclusions: The study results show that offenders from various agencies (Judiciary, Parole, and Corrections) who were administered the LSI-R and ASUS have higher recidivism rates, as criminogenic risk levels move from low to high risk. Additionally, the differences in offender socio-demographic profiles reveal significant differences in recidivism rates. Furthermore, differences in recidivism rates are more pronounced with LSI-R and ASUS variables at most recent assessments, as compared to initial assessments. Finally, there are moderate correlational strengths between recidivism and individual LSI-R and ASUS subdomains.

VIII. Technical Notes Section

1. Technical explanation for Figure 24 – ROC Curves.

The ROC is a statistical measure that predicts an instrument's ability to correctly classify offenders into discrete risk groups. A perfect ROC of 1.0 represents the highest degree of risk selection, with zero degree of risk classification errors, while a ROC coefficient of <0.5 , represents a meaningless risk prediction, including an unacceptable level of false positives, or offenders who are identified as high risk, but in actuality are at low risk of recidivism.

2. Technical explanation for Table 1 – Regression Statistics.

In logistic regression, Exp (B) is a coefficient that measures the LSI-R's power to predict recidivism. Exp (B) is also an expression of the ODDS Ratio (OR), or the relative risk probabilities between a treatment condition and a hypothetical control or reference condition. The reference is considered to be the null (even odds of risk), which does not anticipate any change in the LSI-R scores after reassessment, while the treatment condition anticipates some effect or change on the outcome variable, e.g., recidivism effect. As an example, a hypothetical Exp (B) reveals an odds ratio of 1.41, which means that there is a 41% risk difference in the recidivism ratio $(1.41 - 1.0) * 100 = .41$, or 41%) between the change in Criminal History percentiles after reassessment, as compared to a hypothetical group of offenders with Criminal History percentiles that remain unchanged (do not increase or decrease) after reassessment. This represents a statistically significant odds change of 41%, when compared to the reference/control group.

3. Technical explanation for Table 2 – Correlation Analysis.

This analysis provides a statistical representation of the strength of association between selected variable fields in the LSI-R. Correlations reveal the degree of item-by-item relatedness, which measures the strength and direction of association between the variables identified in Table 2. The correlations represent the strength of association that range from a low of 0.0 (no strength of relationship), to a medium of .50 (moderate strength of relationship), to a high of 1.0 (highest strength of relationship). For example, in a perfect positive correlation, the increase in variable “A” results in the same and identical increase in magnitude for variable “B,” whereas a perfect negative correlation means that an increase in one variable will always result in a commensurate decrease in the other variable.