

Interagency Council on Intermediate Sanctions Assessment Data Brief

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Assessing the Risk of Recidivism: Testing the Validity Of the Level of Service Inventory in Hawaii

The Level of Service Inventory-Revised (LSI-R) has increasingly been recognized as, currently, the best-available risk assessment instrument for offenders. The LSI-R has been specifically designed to contain criminogenic needs (Bonta, 1996)¹, including static, or unchangeable, and dynamic, or changeable, correlates of recidivism. This tool is the most widely used of this type of validated tools and is used not only in the United States, but also in Canada, the United Kingdom, Australia, and New Zealand (Bonta et al., 2001)². In the United States alone, more than 600 agencies utilize the LSI-R assessment instrument (Lowenkamp, 2004)³. The instrument contains 54 items and is similar to the Burgess method of scoring. For example, the presence of a risk factor is scored as a 1 and the absence of a factor is a 0. The sum of all the scores provides the total overall risk score. Additionally, the 54 items in the LSI-R can be collapsed into 10 general criminogenic categories. Bonta notes (1996) that high scores on the specific domains suggest which criminogenic needs should be targeted for treatment or other intervention. Theoretically, lowering scores on dynamic items through appropriate treatment (level of service), and hence overall risk levels, will lead to a reduction in recidivism.

Although this instrument has been validated on a national sample, it is also important to validate this instrument on Hawaii's offender population. Table 1 demonstrates an analysis of probation and parole offenders who were assessed with the LSI-R between October 28, 2002 and May 31, 2004. Data were collected on June 1, 2005 such that all offenders in this sample were followed for a minimum of one year to determine whether any recidivating event had occurred. The differences in recidivism rates by LSI-R risk level are statistically significant. While offenders who were classified as administrative risk on the LSI-R had the lowest recidivism rates (19.2%), there was little distinction in rates between offenders classified as medium and those classified as high.

**Table 1: Rearrest Rates by
LSI-R Classification Levels**

	Percent Rearrest	Base Numbers
Administrative	19.2	421
Low	23.1	91
Medium	41.1	280
High	38.3	350
Surveillance	48.2	85
Total	31.9	1,227

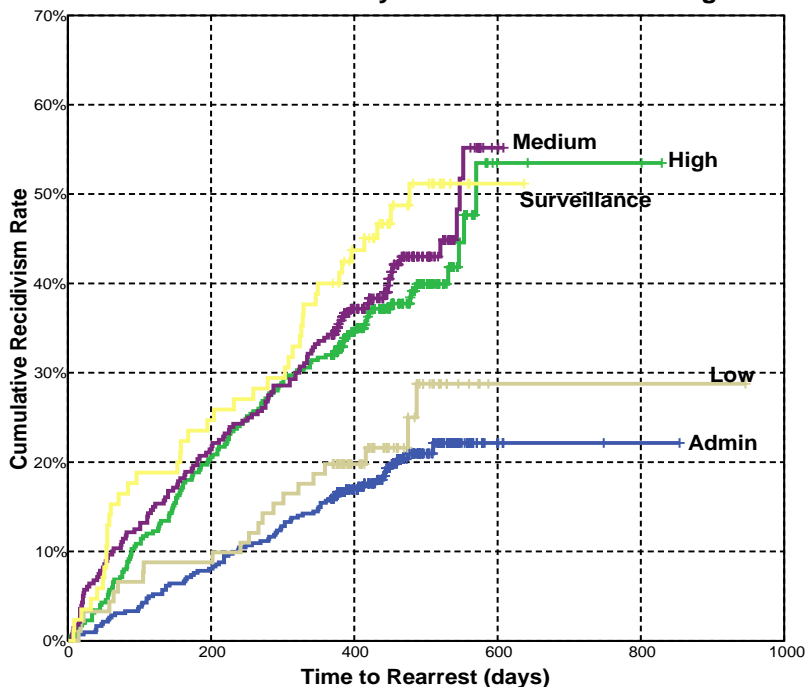
$$\chi^2 = 62.124, p < .001$$

¹ Bonta, James. 1996. "Risk-Needs Assessment and Treatment." *Choosing Correctional Options that Work: Defining the Demand and Evaluating the Supply*. Chapter 2. Edited by Alan T. Harland. Thousand Oaks: Sage Publications.

² Bonta, James; Bogue, Brad; Crowley, Michael; and Laurence Motiuk. 2001. "Implementing Offender Classification Systems: Lessons Learned." *Offender Rehabilitation in Practice*, Chapter 11. Edited by G.A. Bernfeld, D.P. Farrington and A.W. Leschied. John Wiley & Sons.

³ Lowenkamp, C.T. and E.J. Latessa. 2004. "Understanding the Risk Principle: How and Why Correctional Interventions can Harm Low-Risk Offenders." *Topics in Community Corrections*, National Institute of Corrections.

Chart 1: Recidivism Rates by Risk Classification Categories



It is also important to control for the time that each offender was at risk for recidivism. As such, Kaplan-Meier analysis was also employed in the analysis of LSI-R outcomes to determine differences in time to recidivism by risk level.

Kaplan-Meier analysis presents a visual description of both those who have recidivated and those who are predicted to recidivate by proxy score. The Kaplan-Meier analysis demonstrates that those who score lower, especially at administrative and low levels, are rearrested slower and less often than are those at the medium, high, and surveillance levels. Each line in Chart 1 demonstrates the actual and predicted recidivism rate for each level of LSI-R classification. The y-axis, or the left side, represents the overall arrest rate for each group while the x-axis, or bottom scale, represents the time each group takes to get to the cumulative recidivism rate. For example, the bottom line on

Chart 1 represents the group of offenders who were classified as administrative risk by the LSI-R. The actual recidivism rate for that group at almost 400 days out is 19.2, but is projected to reach about 22% at roughly 900 days out. Although the results of this preliminary analysis are not as linear as might be expected, they do nonetheless demonstrate that the LSI-R is, overall, a valid predictor of rearrest. Within the next 12-18 months, the LSI-R cutoff scores should be normed to Hawaii’s population. This will undoubtedly require a change in cutoffs for risk classifications.

LSI-R Domain Areas and Recidivism

Table 2: Recidivism Rates by Criminal History Domain Scores

	Criminal History Domain			
	Low	Medium	High	Total
No Recidivism	70.9%	66.7%	64.7%	68.0%
Recidivism	29.1%	33.3%	35.3%	32.0%
Total	100.0% (468)	100.0% (499)	100.0% (241)	100.0% (1,208)

$\chi^2 = 3.408, p > .05$

Chart 2: Recidivism Rates by Criminal History Scores

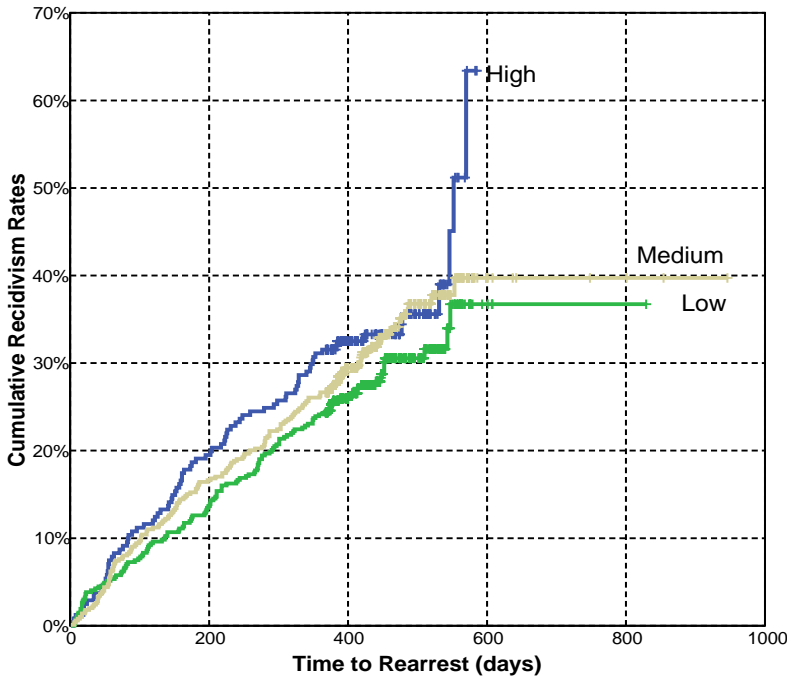


Chart 2 displays survival curves for low, medium, and high scores on the Criminal History Domain. There is little difference in recidivism by scores within the first, roughly, 100 days. However, by 200 days there is a clear divergence in the curves such that low scorers on criminal history are recidivating at a lower rate than are high scores on criminal history. However, even at one year out there is no significant difference between low, medium, and high scores with recidivism outcome.

Chart 3: Recidivism Rates by Educational/Employment Scores

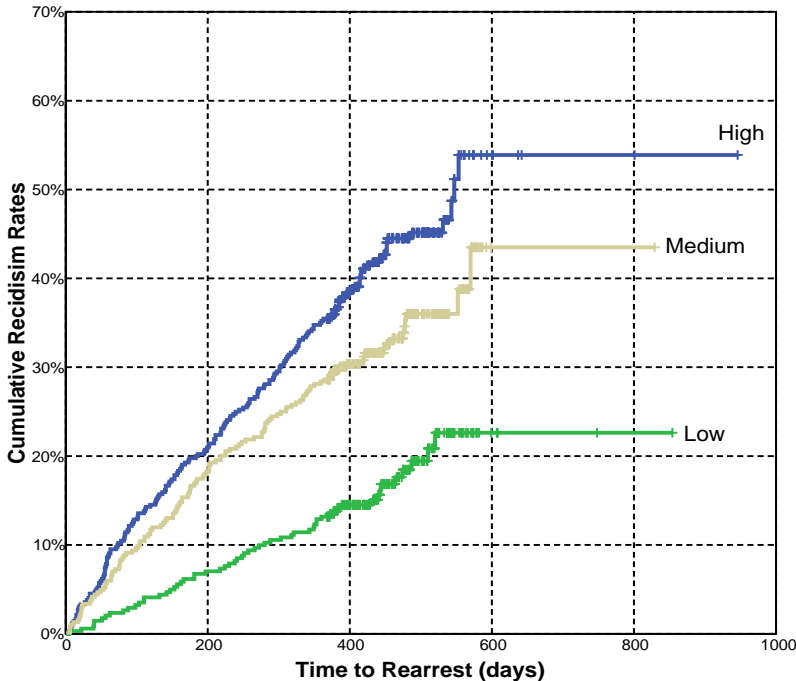


Chart 3 demonstrates survival curves for low, medium, and high scores on the educational and employment domain of the LSI-R. As indicated in Table 3, these differences in recidivism rates by scores are statistically significant. There is a clear pattern of recidivating faster and at higher rates as level of risk increases within this domain area. The actual recidivism rates demonstrate a distinct linear relationship between actual recidivism rates and domain score (Table 3), and the pattern is projected to continue at almost 3 years out (Chart 3).

Table 3: Recidivism Rates by Education/Employment Domain Scores

Education/Employment Domain				
	Low	Medium	High	Total
No Recidivism	83.0%	66.7%	56.9%	67.9%
Recidivism	17.0%	33.3%	43.1%	32.1%
Total	100.0% (341)	100.0% (384)	100.0% (420)	100.0% (1,145)

$\chi^2 = 59.240, p < .001$

Table 4: Recidivism Rates by Financial Domain Scores

Financial Domain				
	Low	Medium	High	Total
No Recidivism	77.5%	60.0%	68.3%	68.0%
Recidivism	22.5%	40.0%	31.7%	32.0%
Total	100.0% (387)	100.0% (478)	100.0% (353)	100.0% (1,218)

$\chi^2 = 30.031, p < .001$

Table 5: Recidivism Rates by Family/Marital Domain Scores

Family/Marital Domain				
	Low	Medium	High	Total
No Recidivism	71.2%	68.8%	63.8%	68.1%
Recidivism	28.8%	31.2%	36.6%	31.9%
Total	100.0% (295)	100.0% (609)	100.0% (290)	100.0% (1,194)

$\chi^2 = 4.319, p > .05$

Table 6: Recidivism Rates by Accommodation Domain Scores

Accommodation Domain			
	Low	High	Total
No Recidivism	70.3%	61.3%	68.1%
Recidivism	29.7%	38.7%	31.9%
Total	100.0% (917)	100.0% (302)	100.0% (1,219)

$\chi^2 = 8.620, p < .01$

Chart 4: Recidivism Rates by Financial Score

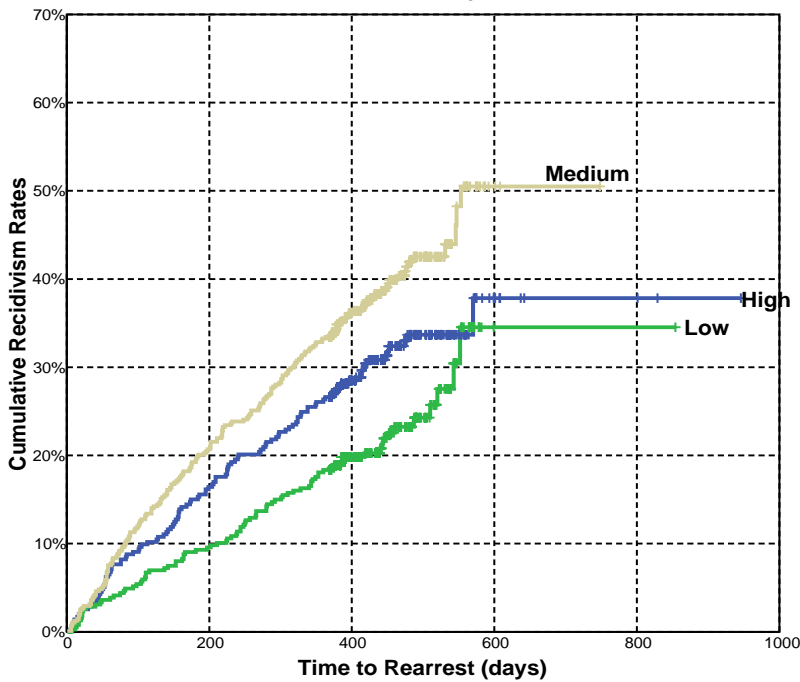


Chart 4 displays survival curves for low, medium, and high scores on the financial domain. Although the divergence in rates by score is statistically significant, it is not in an expected direction. Specifically, offenders who scored high on the financial domain actually recidivate at a lower level than do those who score at the medium level.

Chart 5: Recidivism Rates by Family/Marital Scores

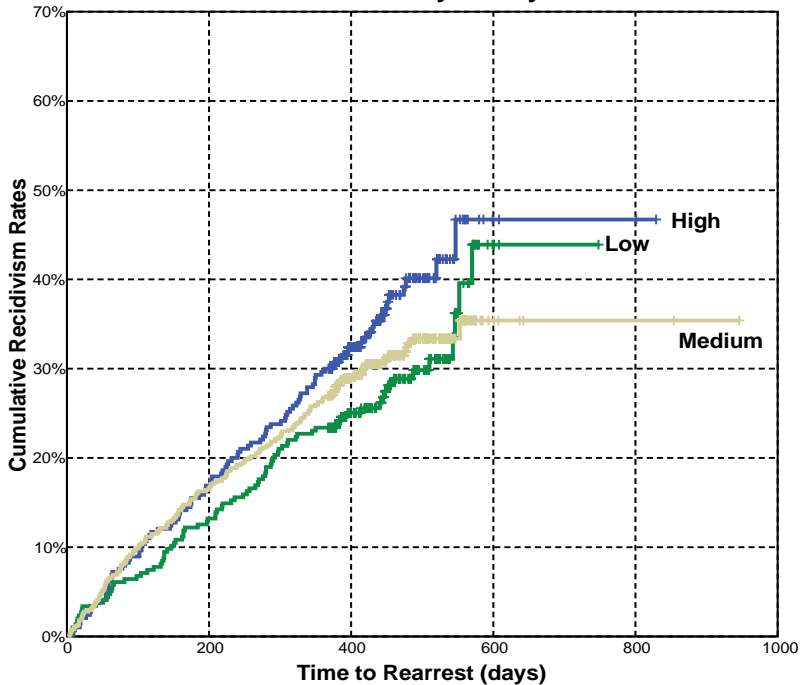


Chart 5 presents survival curves by low, medium, and high scores on the family/marital domain. As witnessed by these curves, there is little distinction between recidivism rates by scores on this factor. The differences that do exist are not statistically significant.

Chart 6: Recidivism Rates by Accomodation Scores

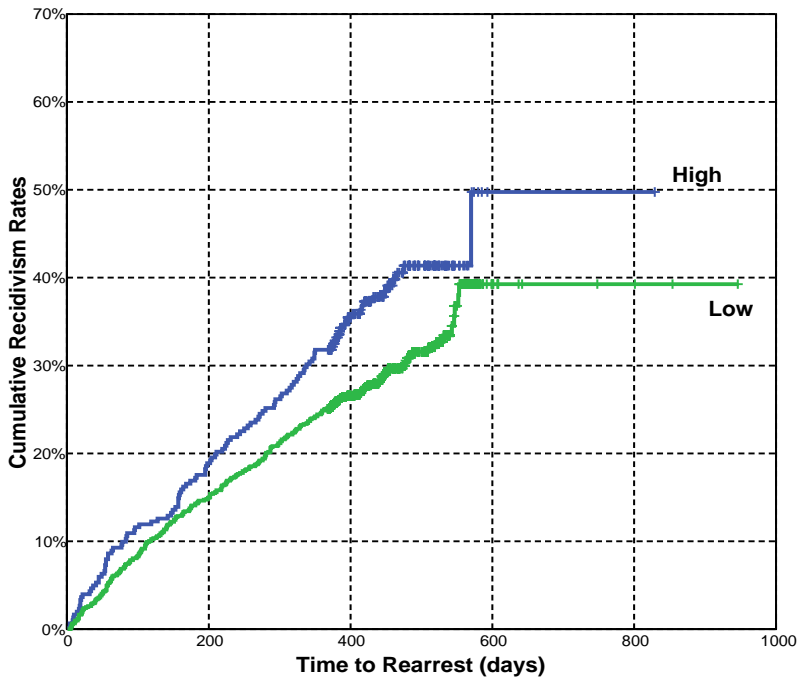


Chart 6 highlights differences in recidivism rates by low and high scores on the accomodation domain. These differences are statistically significant. The revocation curves demonstrate that, at the onset, those offenders who score high on this domain recidivate at a faster and overall higher rate that those scoring at the lower level.

Chart 7: Recidivism Rates by Leisure/Recreation Scores

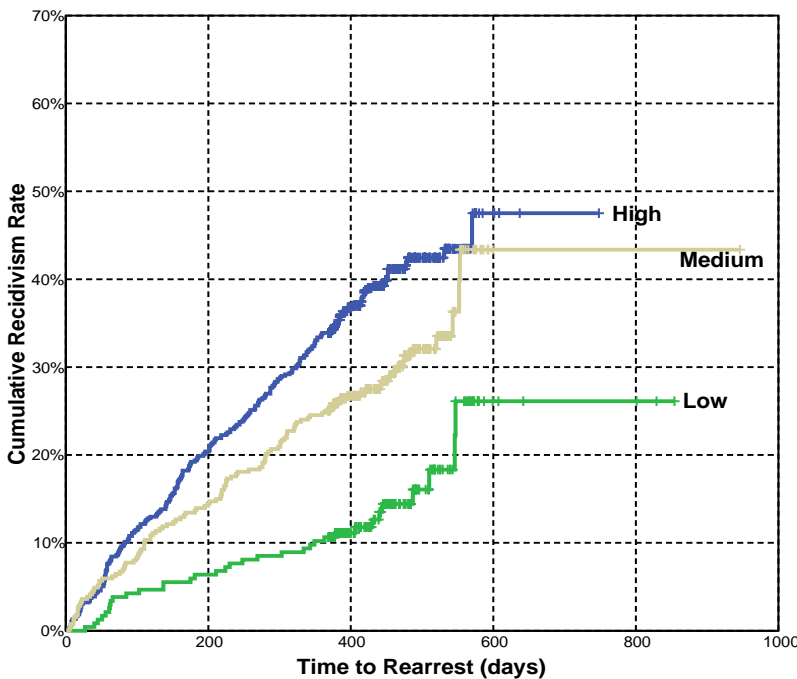


Chart 7 demonstrates survival curves for low, medium, and high scores on he leisure and recreation domain. Rates of recidivism are significantly related to an offender’s score on the leisure/recreation domain. Offenders who scored low on this factor are significantly less likely to recidivate than those scoring at the medium and high levels. Although there is some overlap between medium at high scorers at the onset, by about 80 days out, highest scoring offenders on this domain recidivate faster and at higher rates, followed by medium scoring offenders and then low scoring offenders on this factor.

Table 7: Recidivism Rates by Leisure/Recreation Domain Scores

Leisure/Recreation Domain				
	Low	Medium	High	Total
No Recidivism	85.5%	69.8%	60.0%	68.1%
Recidivism	14.5%	30.2%	40.0%	31.9%
Total	100.0% (235)	100.0% (387)	100.0% (593)	100.0% (1,215)

$\chi^2 = 51.098, p < .001$

Table 8: Recidivism Rates by Companions Domain Scores

Companions Domain				
	Low	Medium	High	Total
No Recidivism	75.0%	72.5%	62.3%	67.9%
Recidivism	25.0%	27.5%	37.7%	32.1%
Total	100.0% (216)	100.0% (408)	100.0% (599)	100.0% (1,223)

$\chi^2 = 17.764, p < .001$

Table 9: Recidivism Rates by Alcohol & Drug Domain Scores

Alcohol & Drug Domain				
	Low	Medium	High	Total
No Recidivism	74.8%	64.4%	55.4%	68.2%
Recidivism	25.2%	35.6%	44.6%	31.8%
Total	100.0% (567)	100.0% (461)	100.0% (157)	100.0% (1,185)

$\chi^2 = 26.175, p < .001$

Table 10: Recidivism Rates by Emotional & Personal Domain Scores

Emotional & Personal Domain				
	Low	Medium	High	Total
No Recidivism	69.2%	66.0%	65.4%	68.0%
Recidivism	30.8%	34.0%	34.6%	32.0%
Total	100.0% (777)	100.0% (306)	100.0% (127)	100.0% (1,210)

$\chi^2 = 1.514, p > .05$

Chart 8: Recidivism Rates by Companions Scores

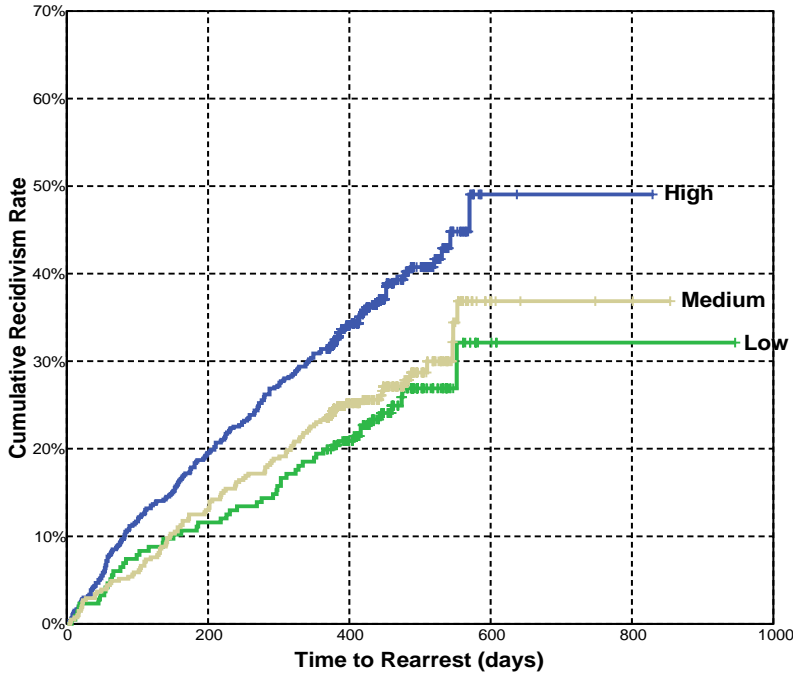


Chart 8 displays survival curves for low, medium, and high scores on the companion domain. Offenders who scored high on this domain are more likely to recidivate than those who score low. The distinction between medium and low is not great, however.

Chart 9: Recidivism Rates by Alcohol & Drug Problem Scores

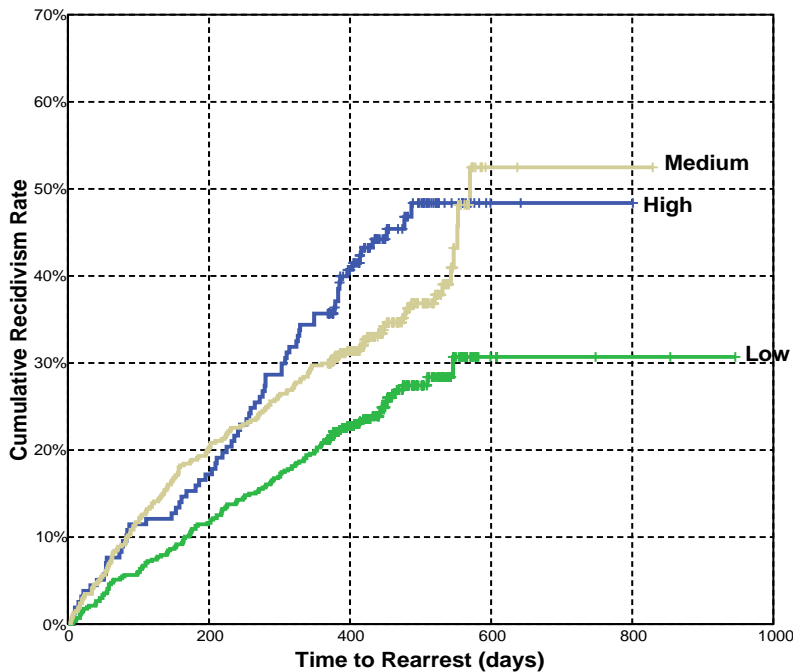


Chart 9 highlights survival curves for offenders who scored low, medium, and high on the alcohol and drug domain. The actual overall rates of recidivism by those who scored high on this domain are higher than offenders scoring at the medium and low level. The predicted recidivism rate for offenders scoring medium on this domain, though, is higher than those scoring at the high level.

Chart 10: Recidivism Rates by Emotional/Personal Scores

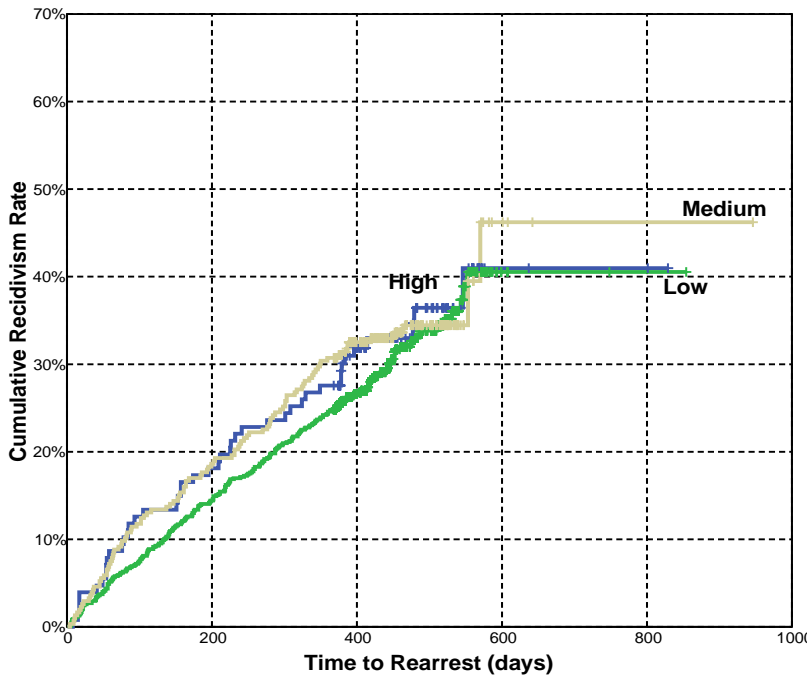


Chart 10 displays survival curves for offenders scoring low, medium, and high on the emotional/personal domain. There is little difference in recidivism rates for these offenders, and the differences that do exist are not statistically significant.

Chart 11: Recidivism Rates by Attitudes and Orientation Score

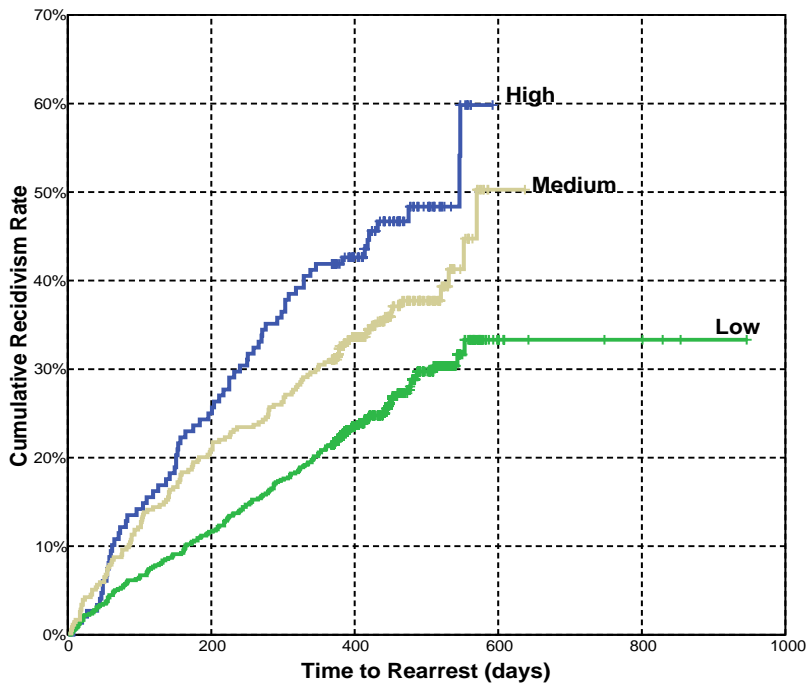


Chart 11 demonstrates survival curves for offenders based on their attitudes and orientation scores. Recidivism rates are in the expected direction and are significantly different, with rates highest for those who scored high on this domain, and lowest for those who scored lowest. Additionally, offenders who scored higher also tended to recidivate at a faster rate. These differences are statistically significant.

Table 11: Recidivism Rates by Attitudes & Orientation Domain Scores

Attitudes & Orientation Domain				
	Low	Medium	High	Total
No Recidivism	73.4%	63.3%	52.7%	67.9%
Recidivism	26.6%	36.7%	47.3%	32.1%
Total	100.0% (714)	100.0% (354)	100.0% (148)	100.0% (1,216)

$\chi^2 = 29.038, p < .001$

Table 12: LSI-R Domain Correlations with Recidivism

LSI-R Scale	Correlation – All (n = 1,227)	Males (n = 1,014)	Females (n = 213)
Criminal History	.06*	.02	.14*
Education/Employment	.23**	.25**	.20*
Financial	.08**	.11**	.09
Family/Marital	.06	.04	.20**
Accommodation	.08**	.07*	.15*
Leisure/Recreation	.20**	.19**	.22**
Companions	.12**	.11**	.17*
Alcohol/Drug Problem	.16**	.13**	.27**
Emotional/Personal	.05	.06*	.05
Attitudes/Orientation	.16**	.14**	.21**

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

Internal Consistency

As a general risk assessment instrument, the LSI-R is expected to be able to predict recidivism, as well as factors that are related to recidivism. In turn, the individual domains within the LSI-R are also expected to correlate with one another since each domain area is expected to correlate with outcome. In other words, even though each domain is designed to assess a different underlying property, each is nonetheless designed to assess the risk of recidivism. Table 13 demonstrates that each of the domain areas within the LSI-R are indeed positively and significantly correlated with each other. As with earlier LSI-R research reported by Andrews and Bonta (2000)⁴, all of the correlations are mild to moderately correlated, in a positive direction, and are statistically significant.

Table 13: LSI-R Subcomponent Intercorrelations (Internal Consistency)

	CH	EE	FIN	FM	ACC	LR	COM	AD	EP	AO
CH										
EE	.16**									
FIN	.13**	.40**								
FM	.24**	.25**	.27**							
ACC	.21**	.27**	.28**	.37**						
LR	.08**	.39**	.20**	.19**	.20**					
COM	.21**	.30**	.14**	.27**	.29**	.25**				
AD	.22**	.34**	.26**	.26**	.31**	.25**	.37**			
EP	.18**	.21**	.28**	.26**	.21**	.12**	.14**	.35**		
AO	.20**	.21**	.15**	.31**	.21**	.23**	.23**	.19**	.23**	

** p < .01

⁴ LSI-R User's Manual. D.A. Andres and James L. Bonta. Third printing, June 2000. Canada.

This report can also be viewed at the ICIS website: <http://cpja.ag.state.hi.us/icis/>

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