



Validation Study of the Youth Level of Service (YLS) Assessment in Hennepin County

Introduction

The Hennepin County Department of Community Corrections and Rehabilitation (DOCCR) uses the Youth Level of Service Assessment (YLS) to estimate risk of future criminal activity for juveniles under county supervision. The YLS is a nationally recognized risk assessment tool and a valid predictor of recidivism among boys and girls ages 12 to 18 according to previous studies (Hoge & Andrews 2010). This report summarizes findings from a YLS validation study of the DOCCR juvenile population conducted by Evaluation, Policy Research and Analysis (EPRA) analysts from the Hennepin County Center of Innovation and Excellence (CIE).

Evidence-based practice requires that assessment tools be normed and validated for the specific population for which they are used. The purpose of this report is to determine whether YLS scores are valid predictors of recidivism among juveniles under DOCCR supervision, whether the assessment is valid for different sub-populations and whether there is any evidence supporting a need to review cut points for YLS risk levels.

Summary

Results

- The YLS is a valid predictor of recidivism for juveniles under DOCCR supervision.
- The YLS is a valid predictor of recidivism for multiple sub-populations under DOCCR supervision, including boys, girls, white youth and youth of color.
- There is evidence of a mismatch between risk level cut points and the natural grouping of recidivism outcomes in the data.

Recommendations

- Continue to use the YLS to assess recidivism risk and target services according to risk level.
- Conduct a cut point analysis to determine if changing cut points could more closely align interventions with the criminogenic needs of youth offenders.

Methodology

Recidivism is defined in this study as a convicted or adjudicated misdemeanor-level offense or higher occurring within one, two or three years of an initial YLS assessment. Recidivism data was taken as reported from MNCED in January 2016.

The study population includes all youth with an initial YLS assessment in 2009 or 2010. YLS assessments in this study were initial assessments occurring before DOCCR interventions took place. Recidivism periods are measured from the YLS assessment date and are cumulative. For instance, two-year recidivism includes any re-offense occurring before the end of the second year after assessment, including the first year. Likewise, three-year recidivism includes events occurring during the first, second or third year after assessment. During 2009-2010, juveniles with less serious offenses were less likely to be given the YLS assessment. For this reason, this study is most reflective of youth receiving traditional probation services from a probation officer.

Population characteristics

Most DOCCR youth who took the YLS in 2009 and 2010 were boys or youth of color. Of the 1,118 youth who had a valid YLS assessment in our study period, 77 percent were boys and 73 percent were youth of color, with Black/African American being by far the most common race reported (60%) (Figures 1 and 2).

Figure 1. Gender

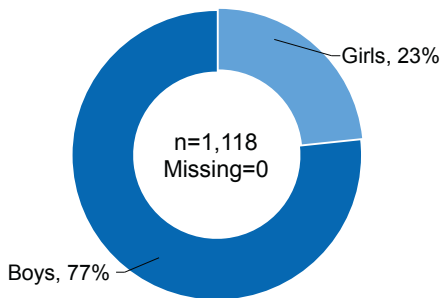
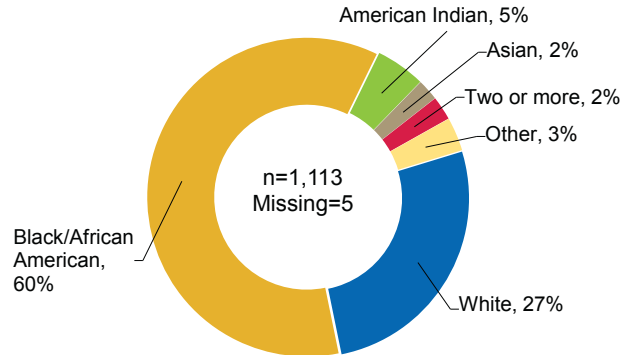
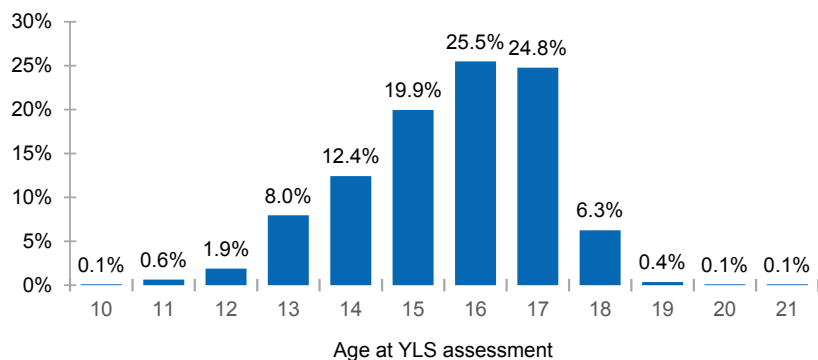


Figure 2. Race and ethnicity



Youth in the study population were typically older teenagers, aged 15-17 at the time of assessment. It was rare for youth to be under age 13 or over age 18 (Figure 3).

Figure 3. Age at YLS assessment



YLS scores and recidivism outcomes

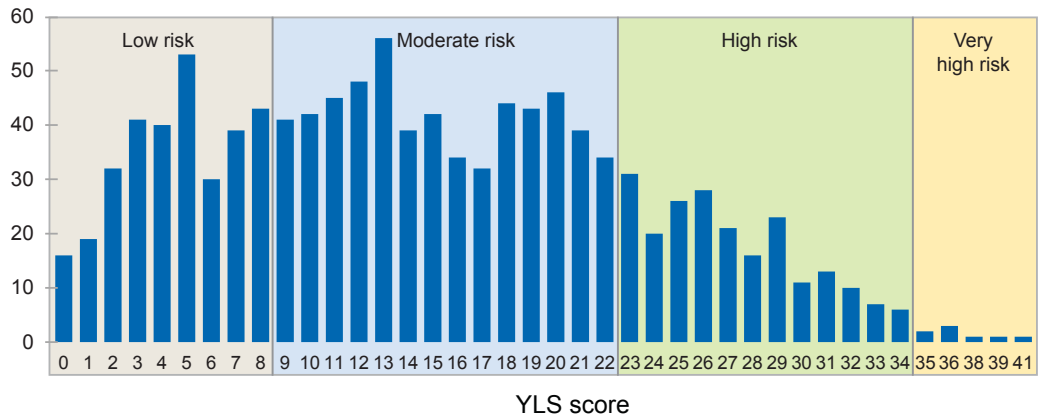
YLS scores were most often in the moderate risk level, with a mean of 14.7 and a median of 14 (Table 1). Figure 4 depicts the distribution of YLS total scores within each YLS risk level category. The distribution of scores was roughly normal with some left skew toward low risk.

Table 1. YLS distribution statistics

N	1118
Mean YLS score	14.7
Standard deviation	8.6
Median YLS score	14

Figure 4. Distribution of YLS scores

Over half of YLS scores were in the moderate risk level.



Recidivism increased over time. Table 2 shows the number recidivating and the associated recidivism rate for each of the three recidivism periods. Recidivism was most common in the first year after assessment and increased more slowly as time went on. There were 403 recidivism events in the first year after assessment and fewer than 80 during the third year after assessment.

Most re-offenses occurred in the first year after the YLS assessment.

Table 2. Number and percent recidivating by recidivism period

Recidivism period	n	pct
1-year	403	36%
2-year	564	50%
3-year	641	57%

Results

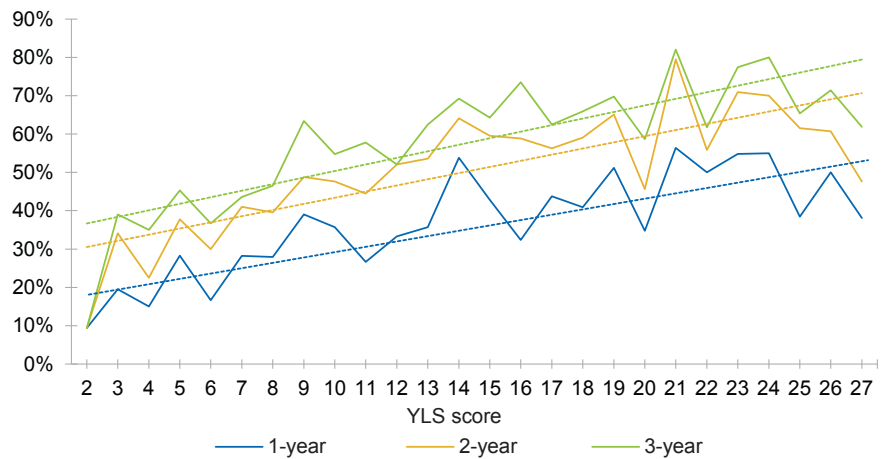
Validation

YLS total scores are valid predictors of recidivism for youth under DOCCR supervision. This pattern of validity remained consistent across all three recidivism periods, suggesting that the YLS predicts recidivism similarly whether a youth is followed for one year after assessment or three.

Recidivism rates generally increased as YLS scores increased. Figure 5 shows recidivism rates for individual YLS scores after one, two and three years. During all three recidivism periods youth with higher YLS scores typically had higher recidivism rates than youth with lower YLS scores.

Higher YLS scores are associated with higher recidivism rates.

Figure 5. Recidivism rates by YLS score, scores 2-27* only



* YLS scores ranged from 0 to 41. The range shown in the chart was chosen because each score had at least 20 youth and most had 30 or more; thus the recidivism rates are more reliable.

The validity of the relationship between YLS scores and recidivism rates is supported by statistical evidence. Table 3 shows the results of a validation model comparing YLS scores with recidivism outcomes. The column labelled ‘B’ is the rate at which YLS scores were related to recidivism risk. In this case, positive numbers in column ‘B’ tell us that a higher YLS score was associated with higher recidivism risk¹, confirming the trend seen in Figure 5.

The column labelled ‘p-value’ tells us whether there is statistical support for this association, that is, whether the relationship is statistically “significant.” If the relationship is statistically significant, then it supports the validity of the instrument. For this study we consider a relationship to be significant when the p-value is less than or equal to .05. In this case, the value was far less than .05 for all three time intervals, supporting the validity of the relationship between YLS scores and recidivism.

The validity of the relationship between YLS scores and recidivism rates is supported by statistical evidence.

Table 3. Relationship between YLS scores and recidivism risk (n=1118)

Recidivism period	B ²	p-value
1-year	.050**	<.0001
2-year	.061**	<.0001
3-year	.065**	<.0001

**Statistically significant on a 95 percent confidence interval.

¹For instance, the coefficient for one-year recidivism means that for every one point increase in YLS score, the log odds of recidivating in the first year after assessment increases by .05. Note that we have omitted the constant value for the sake of brevity so a higher coefficient means a higher slope, but not necessarily higher absolute risk.

²A constant was included in the regression but is not reported for the sake of brevity.

Sub-populations

The YLS is a valid predictor of recidivism for boys, girls, white youth and youth of color. For each of these groups, a higher YLS score was associated with higher risk of recidivism. These results were also statistically significant (Tables 4, 5, 6 and 7).

Boys

Table 4. Regression results for boys (n=857)

Recidivism period	B ³	p-value
1-year	.053**	<.0001
2-year	.066**	<.0001
3-year	.074**	<.0001

**Relationship between YLS score and recidivism risk is statistically significant on a 95 percent confidence interval

Girls

Table 5. Regression results for girls (n=261)

Recidivism period	B ³	p-value
1-year	.042**	.015
2-year	.049**	.003
3-year	.041**	.012

**Relationship between YLS score and recidivism risk is statistically significant on a 95 percent confidence interval

White youth⁴

Table 6. Regression results for white youth (n=258)

Recidivism period	B ³	p-value
1-year	.057**	.001
2-year	.052**	.001
3-year	.063**	<.0001

**Relationship between YLS score and recidivism risk is statistically significant on a 95 percent confidence interval

Youth of color⁵

Table 7. Regression results for youth of color (n=856)

Recidivism Period	B ³	p-value
1-year	.043**	<.0001
2-year	.058**	<.0001
3-year	.058**	<.0001

**Relationship between YLS score and recidivism risk is statistically significant on a 95 percent confidence interval

³A constant was included in the regression but is not reported for the sake of brevity.

⁴Includes White, Hispanic youth.

⁵Includes Black/African American, American Indian, Asian, two or more, and other

Risk level cut points and recidivism risk

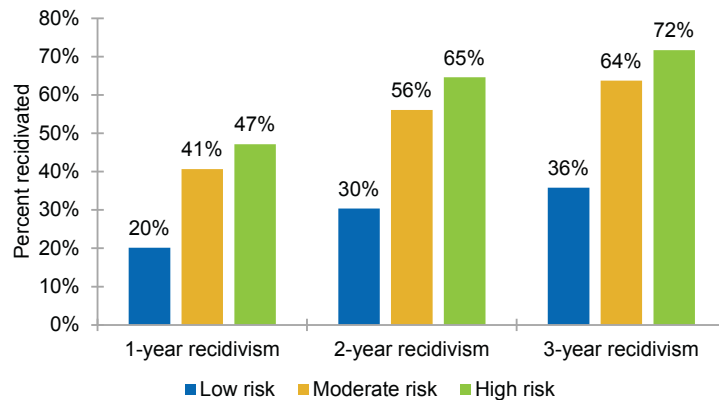
Further analysis points to a mismatch between YLS risk level cut points and recidivism patterns in the data. YLS scores are separated into four risk levels meant to predict increasing levels of recidivism risk:

- Low risk (0-8)
- Moderate risk (9-22)
- High risk (23-34)
- Very high risk (35+)

In this study population re-offense rates differed far more between low and moderate risk youth than between moderate and high risk youth. Figure 6 graphs recidivism rates for low, moderate and high risk youth over all three recidivism intervals. Moderate and high risk youth recidivated at somewhat similar rates while rates for low risk youth were much lower.

Low risk youth recidivated at about half the rate of moderate and high risk youth.

Figure 6. Recidivism outcomes by YLS risk level



Despite this imbalance, recidivism rates for these three risk levels were statistically different from each other. Table 8 shows the results from a test of independence called the chi-square test. P-values below .05 for this test tell us that there is statistical support for the idea that different risk levels have different recidivism rates.⁶ P-values were far less than .05 for all three time periods, supporting the claim that recidivism rates for low, moderate and high risk youth had different rates of recidivism.

However, as noted in the description of figure 6, the difference between low and moderate risk was far larger than the difference between moderate and high risk. Current risk level ranges are performing as intended in many respects, yet they may do a better job at differentiating between low risk and moderate risk youth than they do between moderate and high risk youth. A cut point analysis might improve categorization of youth into risk levels that more closely match criminogenic need.

Table 8. Recidivism risk levels and chi-square test of independence

By YLS risk	n	1-year recidivism	2-year recidivism	3-year recidivism
Low risk	313	20%	30%	36%
Moderate risk	585	41%	56%	64%
High risk	212	47%	65%	72%
Chi-sqr p-value		<.0001**	<.0001**	<.0001**

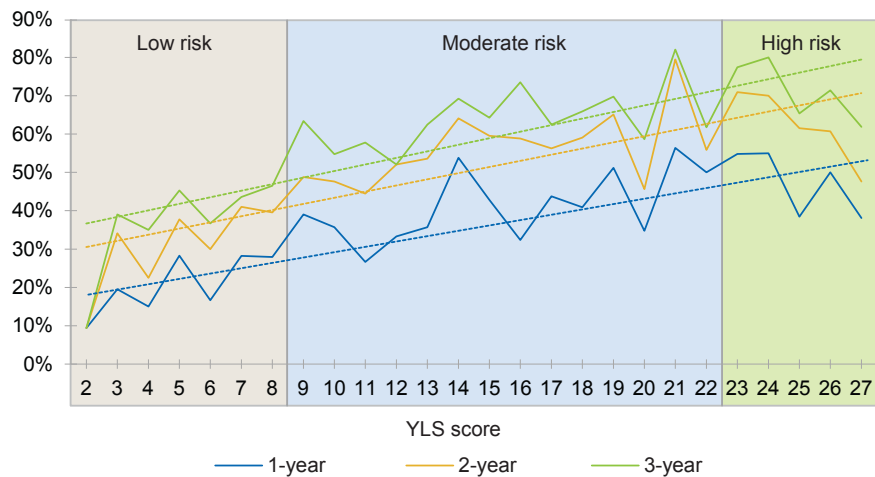
**Recidivism rates are statistically independent on a 95 percent confidence interval

⁶Very high risk youth were excluded from this analysis due to small numbers (n=8).

Graphical evidence further supports the need for a formal cut point analysis. Figure 7 shows recidivism rates by individual YLS scores with markers for each of the YLS risk levels. As noted earlier, recidivism increased as YLS scores increased.

However, current YLS cut points did not appear to match the places where recidivism rates changed most. For instance, there was no obvious difference between high moderate risk youth (e.g. YLS 19-22) and high risk youth in terms of their recidivism rates. Further, there appeared to be a difference between mid-moderate and low-moderate risk youth (e.g. YLS 14-20 and YLS 9-13, respectively). Some of this pattern could be due to the effectiveness of DOCCR interventions at reducing recidivism for youth in certain YLS ranges.⁷ Further analysis would be required to determine the potential impact of successful DOCCR programming on the relationship between the YLS and recidivism rates.

Figure 7. Recidivism rates by YLS score and risk level, scores 2-27* only



It is not clear that cut points align with recidivism patterns

*YLS scores ranged from 0 to 41. This range was chosen because each score had at least 20 youth and most had 30 or more.

References

Hoge, R. D., & Andrews, D. A. (2010). *The Youth Level of Service/Case Management Inventory 2.0 (YLS/CMI) User’s Manual*. Toronto, Canada: Multi-Health Systems.

⁷See methodology section on page 2

Acknowledgements

Sponsors:

Julie Rud, *Organizational Change Management Area Director*, DOCCR
 Danette Buskovich Policy, *Planning and Evaluation (PPE) Manager*, DOCCR

Principal contributors:

Peter Bodurtha, *Principal Planning Analyst*, CIE
 Tamra Boyce, *Principal Planning Analyst*, CIE
 Debra Nonemaker, *Principal Planning Analyst*, DOCCR

April, 2016