Report to the Article 11.5 Advisory Committee

The Validation of the LSI on Community Corrections Populations

Submitted by the Research and Evaluation Subcommittee

Maureen L. O'Keefe
Department of Corrections

G. Edward Wensuc
Department of Public Safety

The prediction of criminal behavior is perhaps one of the most central issues in the criminal justice system. From it stems community safety, prevention, treatment, ethics and justice. Predicting who will re-offend guides police officers, judges, prison officials and parole boards in their decision-making….

D.A. Bonta & James Andrews
The Psychology of Criminal Conduct

I. INTRODUCTION

The Article 11.5 Advisory Committee requested that the Research and Evaluation Subcommittee conduct a validation study of the Level of Supervision Inventory (LSI). A validation project typically involves extensive statistical analysis regarding the instrument's demonstrated ability to predict certain outcomes. To this extent, this report answers those critical questions. The primary goal of this validation study was to determine how well the LSI predicts outcomes on three related measures: 1) any form of recidivating behavior (defined broadly); 2) the commission of a new misdemeanor or felony; and 3) program termination status. Clearly, these measures are highly inter-correlated, but each speaks to an outcome that may have varying importance throughout the criminal justice system.

However, there are other validation issues not addressed in this report because of the vast resources required in conducting such an analysis (e.g., inter-rater reliability, test-retest reliability, sub-scale reliability, group biases, etc.). Furthermore, the Research and Evaluation Subcommittee thought such issues were beyond the scope of this initial validation study.

This report provides a brief history of the Standardized Offender Assessment (SOA) protocol that has been established in Colorado. Included in this section is a cursory review of the literature regarding risk assessment instruments, as well as their applicability in a criminal justice setting.

Next, this report presents the findings of this validation effort. As requested by the Article 11.5 Advisory Committee, this section includes agency-specific findings. The intent is to provide information to each of the agencies regarding how accurately the LSI performs. For example, this report analyzes how well the LSI predicts successful program completion for each of the criminal justice agencies (i.e., probation, community corrections and parole).

Finally, the report presents its conclusions. An important purpose of this report is to assist policy-makers with decisions regarding the expanded use of the LSI.

II. HISTORICAL BACKGROUND

A. Standardized Offender Assessment

Correctional administrators have long understood the public safety problems related to substance-abusing offenders. Not only do substance abusers tend to re-offend, but as a consequence, place an enormous demand upon limited criminal justice resources. In the 1980s, legislatures sought to ameliorate this problem by passing legislation that mandated prison sentences to those convicted of felony drug offenses. Unfortunately, the outcome of mandatory sentencing was that it had a negligible impact upon deterring crime and, in fact, only worsened the resource strain imposed by this group of offenders.

The 1990s witnessed a new approach to managing substance-abusing offenders. Instead of incarceration, treatment coupled with community supervision was argued to be a more effective way of managing this criminal population. There was a great deal of literature published around this time that supported this contention. In 1989, Lipsey published a seminal piece of research which concluded that there were "…statistically significant differences in recidivism that favored treatment over comparison conditions" (Lipsey, 1989).

The pendulant shift within the criminal justice system from a punitive focus to a rehabilitative one is reflected in the increase reliance on offender assessments. Assessment of offenders frequently involves the evaluation of risk level and identification of need areas. Risk and needs assessments serve not only to maintain greater public safety, but also to facilitate the rehabilitation of offenders through improved case planning.

In Colorado, the establishment of a risk and need assessment system was greatly advanced with the passage of HB91-1173. This Bill mandated "a standardized procedure for the assessment of the use of controlled substances by offenders…[1]" This legislation was intended to provide a consistent response to substance abuse at all points of the criminal justice system. Any offender who tests positive for use of controlled substances or alcohol will receive intensified testing, treatment supervision, or other sanctions designed to control substance abuse.

However, it was not until 1993 that the Standardized Offender Assessment (SOA) protocols were firmly established[2]. The first milestone was the selection of a battery of assessment instruments. The following five instruments were initially selected to compose the battery[3]: 1) Alcohol Dependence Scale (ADS); 2) Drug Abuse Screening Test (DAST); 3) Adult Substance Use Survey (ASUS), 4) Substance Use History Matrix (SUHM) and 5) the Level of Supervision Inventory (LSI).

The second milestone was the development of a "Priorities for Treatment Matrix". This matrix combines "criminal risk" scores with "treatment needs severity" scores to produce

[1] HB91-1173 (later known as Article 11.5)
[2] STATUS OF COLORADO'S STANDARDIZED OFFENDER ASSESSMENT (SOA); April 10, 1997.
[3] April 1, 1998, the ADS and DAST were replaced by the SSI (Simple Screening Inventory)

objective criteria for assigning clients to a continuum of treatment services. Those offenders with high risk and high needs receive the most intensive treatment services[4].

B. Level of Supervision Inventory[5]

The LSI was developed in the late 1970s in Canada through the collaboration of probation officers, correctional managers, practitioners, and researchers (Andrews, 1982). The LSI is comprised of 54 static and dynamic items across ten sub-scales[6]. The "static items" tap into the characteristics of a person that are largely constant or unchangeable (e.g., criminal history). The value of including static items is that they are often the most predictive determinants of future recidivism.

As mentioned, the LSI also contains "dynamic items." These items depict which direction an individual is moving along on the "social/anti-social continuum." The value of dynamic items is that they can direct case planning (e.g., treatment plans), thereby affecting offenders' likelihood of re-offense.

In addition to predicting recidivism, the LSI is also an effective case management tool. Correctional professionals can utilize sub-scale scores in developing case plans. Although changes in some of the sub-scales may impact recidivism risk more than others, the value of these sub-scale scores is that can shape case plans to impact an offender's functioning. For example, if an offender "loads" relatively high in the sub-scale of Alcohol and Drugs, then the correctional professional can develop a strategy to ameliorate this treatment need area.

C. Actuarial Assessment: A Literature Review

The art of predicting future criminal behavior has evolved into a rigorous science. What was once accomplished with crude skull measurement tools[7] has been improved with carefully constructed actuarial risk-assessment instruments. These risk assessments are predicated on the assumption that *individual criminal behavior can be predicted by assigning offenders to groups that have explicit re-offending probabilities*.

This is not to suggest that risk-assessment instruments predict *individual* behavior. Instead, assessments can provide highly accurate predictions of how individuals with like characteristics might behave in the future. Instead of treating offenders as individuals, risk assessments treat them as members of groups for which there is an aggregate, identifiable level of risk (Clear, 1988).

The literature on criminal behavior clearly states that certain risk factors, particularly when considered in combination, are highly correlated with future criminal conduct[8]

[4] Except for Level 7.
[5] A copy of the LSI is attached as **APPENDIX A**
[6] 1) Criminal History; 2) Education/Employment; 3) Financial; 4) Family/Marital; 5) Accommodation; 6) Leisure/Recreation; 7) Companions; 8) Alcohol/Drug Problems; 9) Emotional/Personal; and 10) Attitude/Orientation
[7] Cesare Lombroso, a nineteenth-century anthropologist, theorized that an individual's likelihood of committing criminal acts could be determined by measuring the bony structures in the skull.
[8] 1) History of criminal behavior; 2) Personal competencies (e.g., self-management deficits); 3) Cognitive Supports (e.g., pro-criminal sentiments); and 4) Social supports (e.g., anti-social associates).

(Rogers, 1981). It is considered a remarkable feat, within the context of social science research, to be able to accurately identify *relationships that have greater than a 0.20 level of correlation* (Welch and Comer, 1988). For example, in the 1960s, the dominant theory amongst academicians and practitioners was that crime was primarily attributed to the factors of *age, gender, socio-economic status and race*. Research suggests that there is some validity to this theory; however, the strength of *all these factors* combined nets a correlation of only 0.15 (Gendreau, Little, & Goggin, 1996).

Despite the parsimonious composition of many risk assessments, these instruments have consistently yielded relatively high levels of correlation. In 1996, Gendreau et al. conducted a meta-analysis of the predictors of adult offender recidivism[9]. In this study, Gendreau et al. looked at the degree to which risk and anti-social assessments predicted recidivism. The results of this analysis are presented below:

Table 1. Comparison of Risk-Assessment Predictability

PREDICTOR	NUMBER OF CASES	MEAN R
Risk Scales		
LSI-R	4,579	.35
SFS[10]	9,850	.29
Wisconsin Risk-Needs	14,092	.27
Other	29,290	.30
Anti-Social Scales		
MMPI Bases	3,420	.16
PCL[11]	1,040	.28
Other	8,875	.16

[9] Gendreau et al.
[10] Salient Factor Scale
[11] Psychopathy Checklist

III. STUDY METHODOLOGY

The participants in this study included 403 probationers, 135 direct sentence community corrections offenders, 85 transitional community corrections offenders, and 172 parolees. Participants were admitted to the respective jurisdiction in the Fourth Judicial District between October, 1994, and January, 1996.

Demographic characteristics were examined for the participants in this study. The mean age for each group was as follows: 30.3 probation (n = 392), 30.5 direct sentence community corrections (n = 134), 31.4 transitional community corrections (n = 85), and 32.7 parole (n = 172). Table 2 presents other demographic characteristics of the offenders. Participants within each jurisdiction were compared to determine where group differences lie. Groups differed on age, $F(3, N = 782) = 3.66$, $p = .01$. Scheffe's post hoc analysis revealed that parolees were older than probationers. For gender, significant group differences were found, $\chi^2(3, N = 709) = 8.42$, $p = .04$, indicating a greater rate of females under probation supervision than any other jurisdiction. For the ethnicity analysis, only offenders of Caucasian, African American, or Hispanic descent were included to meet the test assumptions. There were no differences between the jurisdictions on ethnicity, χ^2 $(3, N = 608) = 4.75$, $p = .58$. A significant difference was found between groups on marital status, $\chi^2(3, N = 700) = 15.88.$, $p = .01$. Offenders under probation and direct sentence community corrections supervision were more likely to be single while offenders under transitional community corrections or parole supervision were more likely to be married.

Table 2. Participant Demographic Characteristics

	Probation		Diversion (CC)		Transition (CC)		Parole	
	%	*n*	*%*	*n*	*%*	*n*	*%*	*n*
Gender								
Male	78.6	250	88.1	118	85.9	73	86.0	148
Female	21.4	68	11.9	16	14.1	12	14.0	24
Ethnicity								
Caucasian	40.3	123	50.8	66	56.0	47	45.9	79
African American	24.3	74	26.2	34	25.0	21	34.3	59
Hispanic	14.8	45	12.3	16	16.7	14	17.4	30
Asian	2.0	6	0.0	0	0.0	0	0.6	1
Native Indian	7.5	23	6.2	8	2.4	2	1.2	2
Other	11.1	34	4.6	6	0.0	0	0.6	1
Marital Status								
Single/Never Married	55.2	175	53.5	69	40.5	34	47.1	80
Married/Common Law	21.1	67	19.4	25	38.1	32	30.6	52
Separated/Divorced/Widowed	23.7	75	27.1	35	21.4	18	22.4	38

When conducting validation research, it is important to ensure the integrity of the data. Unfortunately, this study was not able to attest to the quality of the data because it was collected archivally. Numerous scoring errors were detected with the LSI assessments, including syllogistic rule violations and mathematical errors. Scoring errors tended to both overrepresent and underrepresent actual risk scores. In addition, since the program start date was not collected for probationers, it was difficult to determine whether a new offense occurred before, during or after supervision for probationers.

Outcome variables are important as criterion measures against which to determine whether an instrument is valid for its intended purpose. With risk assessments, recidivism

is often the criterion measure. Recidivism is defined in varying terms; some examples include rearrest, new conviction, reincarceration, and program termination type. There are problems associated with most outcome variables; therefore, it is beneficial to use multiple criterion measures. Two types of criterion measures were used in this study, including rearrest and program termination type. While data regarding program termination type was straight-forward, the rearrest data was suspect. Arrest data is often entered at local police agencies, enabling various interpretations to be applied when coding data. As well, rearrest data is frequently recorded inconsistently. A final concern with rearrest data is that it may not be an actual re-offense, merely an arrest for suspicion of criminal involvement.

Despite the problems inherent in conducting applied research, these outcome variables were considered useful for the present research. There was no indication that these errors represented a systematic bias. Rather, the error associated with outcome measurement was likely to be evenly distributed, contributing to greater variability among measures. Unfortunately, increased variability resulting from error makes it more difficult to establish a relationship between variables.

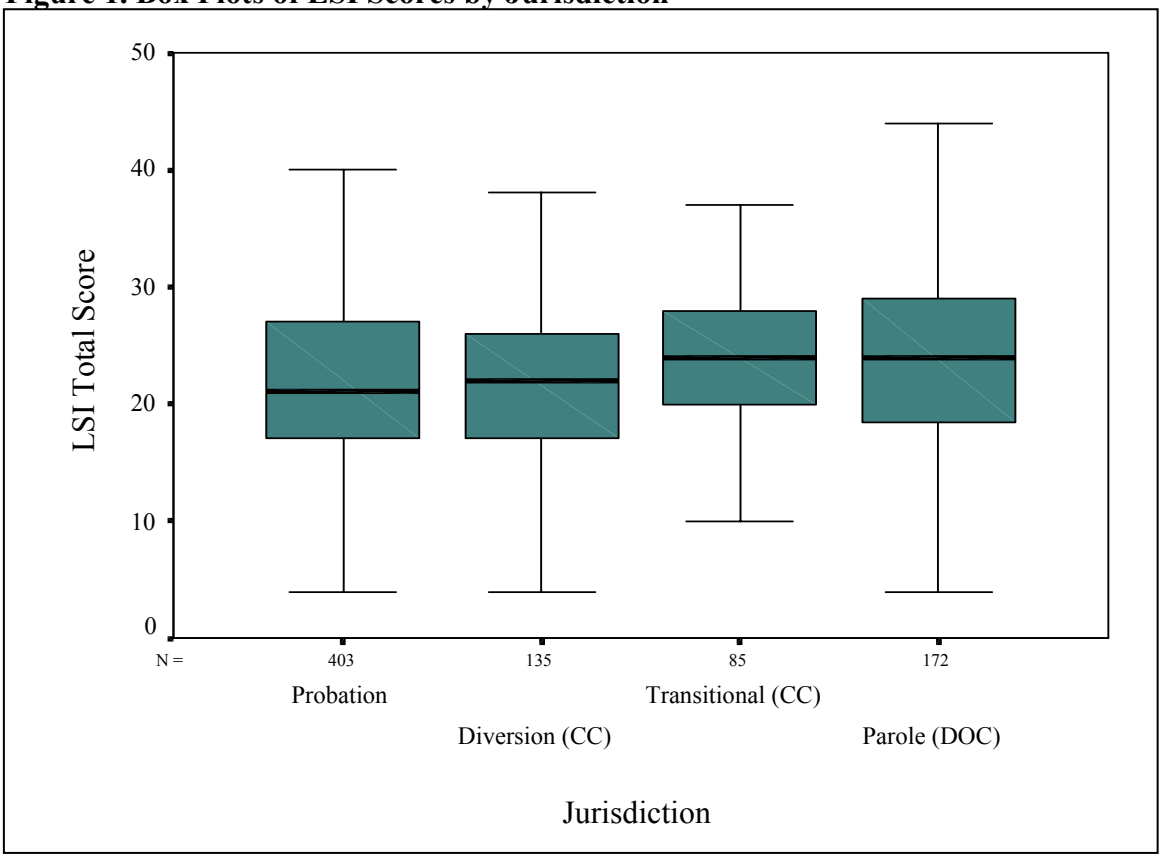
V. FINDINGS

LSI scores were examined for each agency. Table 3 presents information regarding the central tendencies of risk scores. Mean LSI scores were analyzed to determine if they varied by group (see Figure 1). Probation and direct sentence community corrections offenders had statistically lower LSI scores than transitional community corrections and parole offenders, F (3, N = 794) = 4.82, p = .002. However, it should be noted that there was only a mean difference between groups of approximately 2 points.

Table 3. Central Tendencies of LSI Scores by Supervising Agency

	Mean	Standard Deviation	Median	Sample Size
Probation	21.58	7.75	21	403
Community Corrections – Diversion	21.56	7.18	22	135
Community Corrections – Transition	23.87	6.47	24	85
Parole	23.70	7.95	24	172

Figure 1. Box Plots of LSI Scores by Jurisdiction



Three outcome variables were collected for the four groups. The first outcome variable was a rank ordering of the most serious type of re-offense. The ratings involved the following: (1) none, (2) failure to appear, (3) technical violation, (4) driving under the influence, (5) misdemeanor, (6) nonviolent felony, and (7) violent felony. The second outcome variable was dichotomous; offenders who were rearrested for a misdemeanor or felony were considered recidivists while all others were coded as non-recidivists. The

third outcome variable was also dichotomous; offenders were classified as successful or unsuccessful program completers.

To establish predictive validity estimates, Pearson correlations of the LSI scores to each outcome variable were calculated for each group. Table 4 presents the zero-order correlation matrix. An important aspect of a risk instrument is its ability to differentiate offenders who will re-offend from those who will not. Offenders were classified as recidivists and non-recidivists (using data from the second outcome variable). Figure 2 displays scores for each group. The LSI successfully differentiated recidivists from non-recidivists for probationers t (401) = -5.85, $p < .001$, direct sentence community corrections offenders, t (133) = -2.79, $p = .006$, and parolees, t(170) = -4.08, $p < .001$.

Table 4. Pearson Correlations of LSI Scores to Outcome Measures

	Outcome 1: Rank Order Rearrest Rates		Outcome 2: Dichotomous Rearrest Rates		Outcome 3: Program Termination Status	
	r	*n*	*r*	*n*	*r*	*n*
Probation	.32*	403	.28*	403	.25*	403
Community Corrections – Diversion	.25*	135	.24*	135	---	---
Community Corrections – Transition	.02	85	-.07	85	.13	85
Parole	.36*	172	.30*	172	.28*	172

* $p < .01$.

Further exploration of the LSI's ability to differentiate between groups was conducted. Mean scores for successful and unsuccessful program completers were compared within each jurisdiction. Figure 3 depicts scores for each group. The LSI differentiated successful program completers from unsuccessful program completers for probationers, t(401) = 5.22, $p < .001$, and parolees, t(170) = -3.75, $p < .001$ (data were not available for direct sentence community corrections).

Figure 2. Mean LSI Scores by Rearrest Rates

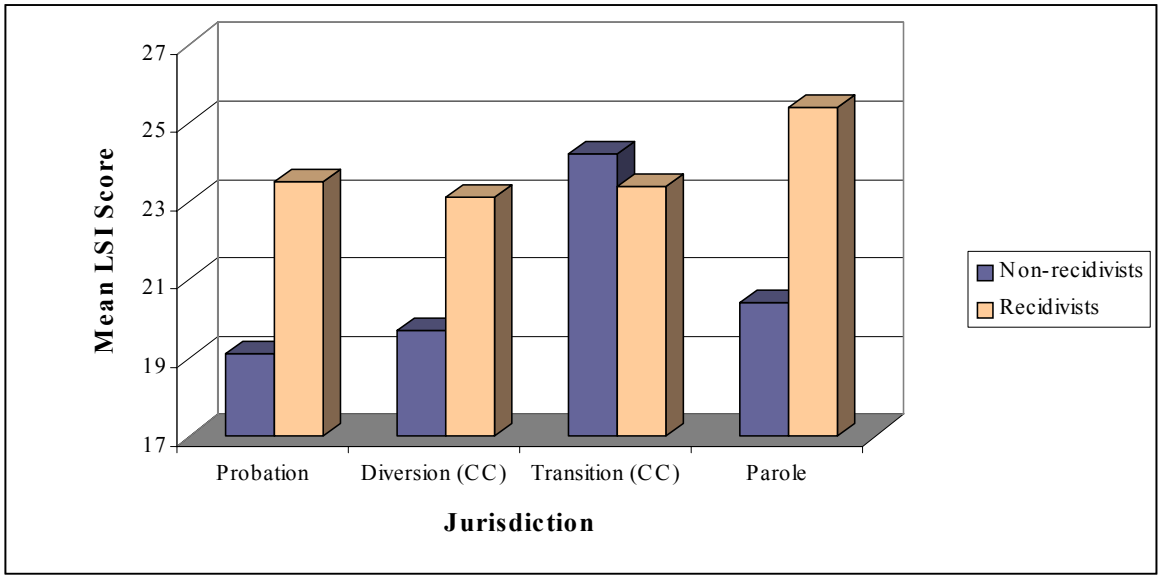
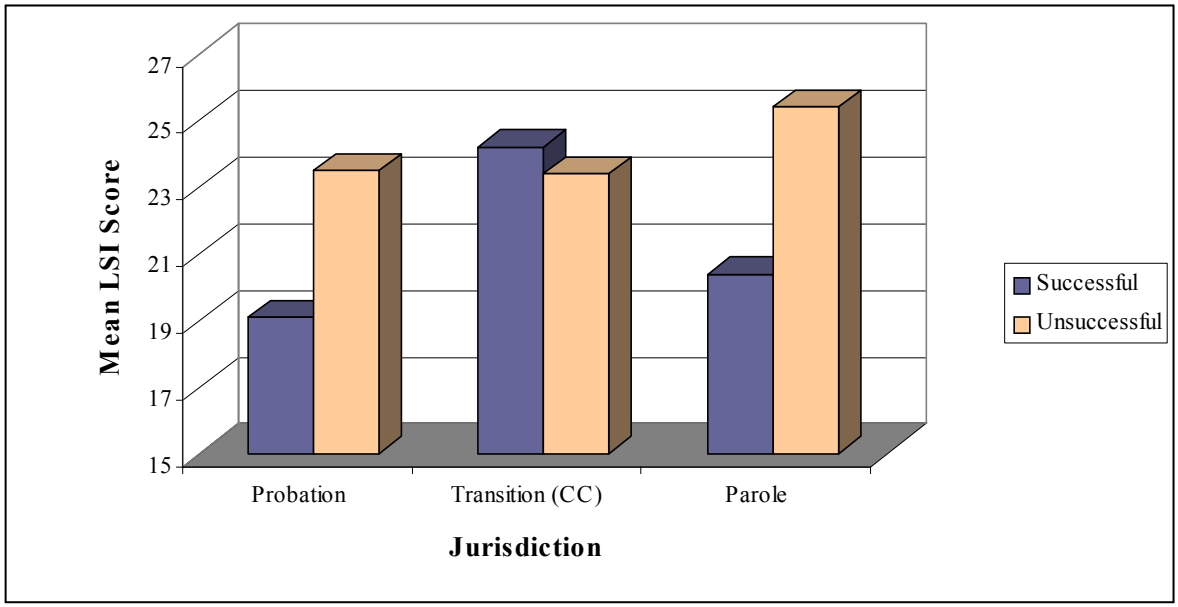


Figure 3. Mean LSI Scores by Program Termination Status



V. CONCLUSIONS

The primary goal of this study was to determine the validity of the LSI with Colorado community-based offenders (i.e., probation, community corrections and parole). The study used three related outcome measures as the means of validating the instrument: 1) any form of recidivating behavior (defined broadly), 2) the commission of a new misdemeanor or felony, and 3) program termination status.

The findings from this study were consistent with those from other validation efforts. Not only were three outcome measures used, three different analytic procedures were engaged to establish the validity of the LSI. Regardless of the outcome measure or the analysis used, the findings were consistent across groups. The LSI predicted outcomes for probationers, parolees, and direct sentence community corrections offenders. The inability of the LSI to predict re-offense and program termination type with transitional community corrections was surprising, particularly since this population does not appear to differ from the other groups in significant ways. However, the use of the LSI with this population should not be discounted without further evaluation (see O'Keefe, Klebe, & Hromas, 1998).

Taken together, these findings suggest that LSI scores are good predictors of whether offenders will successfully complete their supervision and whether they will re-offend. This finding is significant because Colorado uses the LSI to develop case plans and sentencing recommendations.

Another interesting finding was the consistency of mean LSI scores across groups. As discussed previously, the study sampled offenders from probation, community corrections and parole. The difference in the mean scores across these populations was less than 2 ½ points. This may indicate that risk levels of offenders within these agencies are relatively comparable, although further research is needed to verify this assertion[12].

In conclusion, the LSI appears to be a valid predictor of recidivism risk with Colorado's community-based offenders. This does not suggest that without proper training and adequate quality control, that this instrument will continue to evidence such high levels of predictability. Future research efforts should ensure that the LSI is delivered and implemented as intended. To assure that these research efforts can be conducted, it is imperative that policy-makers earmark sufficient resources for their completion.

[12] Although criminal history scores were not collected, it is assumed that significant differences in these score would exist among these criminal justice agencies.

BIBLIOGRAPHY

Andrews, D. & Bonta, J. (1994). *The Psychology of Criminal Conduct*, Cincinnati: Anderson Publishing Company.

Clear, T. (1988) *Statistical Prediction in Corrections*, Research in Corrections, Vol. 1, Issue 1.

Colorado Criminal Justice Review (1995). Prepared for the Division of State Programs Center for Substance Abuse Treatment, Johnson, Bassin & Shaw, Inc.

Gendreau, P., Little, T., & Goggin, C. (1996*), A Meta-Analysis of the Predictors of Adult Offender Recidivism: What Works*, Criminology, Volume 34, Number 4.

Lipsey, M.W. (1989*). The Efficacy of Intervention for Juvenile Delinquency: Results from 400 Studies*. Paper presented at the 41st annual meeting of the American Society of Criminology, Reno, NV.

O'Keefe, M., Klebe, K., & Hromas, S. (1998). *Validation of the Level of Supervision Inventory (LSI) for Community Based Offenders in Colorado*. Colorado Springs: Colorado Department of Corrections.

Welsh, S. & Comer, J. (1988). *Quantitative Methods for Public Administration: Second Edition*, Pacific Grove: Brooks/Cole Publishing Company.

APPENDIX A