

Review of Latest Research on Use and Validity of LSI-R  
Oklahoma Department of Corrections—July 2009

Review of Latest Research on Use and Validity of the Level of Service  
Inventory-Revised (LSI-R)  
Oklahoma Department of Corrections—July 2009  
A DOC “White Paper”

**Abstract**

Increased interest in offender risk assessment in both sentencing and corrections has increased interest in the Level of Service Inventory-Revised and its related revisions. The recent research reviewed in this White Paper indicates that, properly administered, the instrument remains a very useful tool for these purposes, with the qualifiers and provisos noted herein, particularly regarding race/ethnicity and gender. The usual call for more research and evaluation, however, is particularly relevant here as the LSI-R is advanced into more jurisdictions, contexts, and uses, especially those for which it might not have initially been designed or conceived.

Risk assessment of offenders has become more relevant recently as scholars and practitioners advocate pre-sentencing assessment (Chapman, 2009) and greater differentiation of treatment while under correctional supervision (Flam, 2009). One of the major tools mentioned for these efforts is the widely used Level of Service Inventory-Revised (LSI-R), which scores offenders as low, moderate, or high risk based on 54 items about the offender categorized into ten factored sublevels (criminal history, education/employment, financial situation, family/marital relationships, accommodation, leisure and recreation, companions, alcohol or drug use, emotional/mental health, and attitudes and orientation). Special versions of the LSI-R with selected elements have also been implemented, including a “screening” version (LSI-SV) with fewer items. Descriptions of the basic instrument and the “screening” version are below:

*The LSI-R™ assessment is a quantitative survey of offender attributes and offender situations relevant for making decisions about levels of supervision and treatment. The instrument’s applications include assisting in the allocation of resources, helping to make probation and placement decisions, making appropriate security level classifications, and assessing treatment progress. The 54 LSI-R items are based on legal requirements and include relevant factors for making decisions about risk level and treatment.*

*The LSI-R:SV is a screening instrument ideal for use when a complete LSI-R™ assessment may not be feasible, due to time constraints or insufficient staff resources. The LSI-R:SV consists of eight items selected from the full LSI-R. It provides a brief summary of dynamic risk areas that may require further assessment and possible intervention. Research with the LSI-R:SV shows it is predictive of a variety of outcomes important to offender management. Among probation samples, the LSI-R:SV scores predicted violent recidivism and violations while under community supervision. Among incarcerated offenders, scores have predicted success in correctional halfway houses and institutional misconduct (assessments.com, September 2006 [http://www.assessments.com/content/press\\_releases/Assessments.com%20and%20MHS.pdf](http://www.assessments.com/content/press_releases/Assessments.com%20and%20MHS.pdf)).*

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Given the growing interest in and use of the LSI-R, it is helpful to review the more recent research on the instrument and its applicability. The following paper will provide brief notes on the research and a bibliography for reader pursuit of individual topics.

### LSI-R Use and Applicability

A 2006 meta-analysis of the predictive factors of adult offender recidivism (Gendreau et al., 2006) found that the strongest domains were “criminogenic needs, criminal history/history of antisocial behavior, social achievement, age/gender/race, and family factors. Less predictive factors included intellectual functioning, personal distress factors, and socioeconomic status. The study also found that the LSI-R, which includes the “strongest domains,” was “identified as the most useful actuarial measure.” A 2009 study of federal probationers (Flores et al., 2009) concluded that

*Results from the predictive validity analyses were encouraging and provided evidence that the LSI-R was a valid and robust predictor of subsequent incarceration for this sample of federal probationers. Additionally, the multivariate analysis conducted in this research found that the LSI-R remained a valid predictor of subsequent incarceration when the effects of age, sex, and ethnicity were controlled. Taken together, these results make a strong case for the generalizability of the LSI-R to diverse offender populations.*

A 2007 study of Iowa offenders (Lowenkamp and Bechtel, 2007; see also Vose, 2008 and Lowenkamp et al., 2009) showed “that the total LSI-R score is significantly related to the prediction of future criminal behavior. The higher the total risk score, the more likely that the client would reoffend. Both the bivariate and receiver operating characteristic (ROC) analyses showed that the LSI-R was a valid predictor of reoffending for probationers and parolees.”

Questions have arisen regarding the performance of the LSI-R versus other risk assessment instruments. In all, despite some contention, the LSI-R remained seen as a reliable assessment tool compared to the Static-99 (Gentry et al., 2005) and the Hare PCL-R (Hemphill and Hare, 2004), with authors recommending supplementing use of various instruments to improve predictions. In addition, Austin et al. (2003) asserted that the LSI-SV was superior in recidivism prediction to the larger instrument due to the former’s more concentrated emphasis on specific variables most related to potential reoffending:

*. . . only 8 of the 54 LSI-R items were found to be associated with recidivism. While the LSI-R classifies prisoners according to their recidivism rates, the lack of reliability among many of the LSI-R items diminishes the overall validity. The LSI-SV (the Screening Version) can be substituted for the LSI-R. Using a combination of the 8 most reliable and valid items from the LSI-R, plus several other demographic items resulted in the best predictive results.*

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### **LSI-R and Offense Types**

The validity of the LSI-R for offenders with specific offense types has also been researched in recent years. For example, researchers have expressed concerns about the utility of the assessment for violent offenders and the need for more specific tools for them (Manchak et al., 2007). Girard and Wormith (2004) found that a later revision called the Level of Service Inventory-Ontario Revision had a “General Risk/Need score correlated highly with general recidivism and, to a lesser extent, with violent recidivism. It also produced similar predictive correlations among subgroups of sexual offenders, domestic violence offenders, and offenders with mental health problems. The Specific Risk/Need scale produced a slightly higher correlation with violent recidivism.”

Among other offender/offense types under study, Hendricks et al. (2006) discovered that the LSI-R only predicted 66% of spousal abuse recidivists successfully. Kelly and Welsh (2008) found that “the LSI-R total score was found to be a stable, significant predictor of reincarceration for a sample of 276 drug-involved offenders. This finding held up in multivariate analyses even when controlling for a variety of other factors including age, criminal history, time-at-risk in the community following release from prison, and treatment-related variables.”

### **LSI-R and Race/Ethnicity**

Although the LSI-R may have validity for general populations, it is possible, since it was initially tested on primarily Caucasian offenders, that it has less when applied to specific racial or ethnic populations. Several studies have been conducted to investigate that point. Schlager and Simourd (2007) looked solely at African American and Hispanic offenders and concluded that “the instrument had acceptable psychometric properties, but that the predictive validity results were lower than previous studies of the LSI-R.” Fass et al. (2008) compared the LSI-R to the COMPAS (Correctional Offender Management Profiling for Alternative Sanctions) assessment tool with a group of offenders “with a substantial proportion of ethnic minority offenders.” Their conclusion? “. . . both the LSI-R composite score and the COMPAS recidivism score have inconsistent validity when tested on different ethnic/racial populations. Furthermore, the results suggest that different ethnic/racial groups have varying risk and needs factors that predict recidivism.”

Holsinger et al. (2006) found in a study of white and Native American offenders that the LSI-R had “modest predictive validity utilizing the entire sample of offenders, with varying results for subsequent subgroups. Whiteacre’s examination of a large federal community corrections center (2006) “found a tendency toward more classification errors for African Americans than Caucasians or Hispanics, though the types and rates of errors were dependent on the choice of the cutoff score and the performance measure to be predicted.” Thus, overall, recent research, while still supportive of the LSI-R, does lead to calls for greater sensitivity toward racial and ethnic differences in its application.

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### **LSI-R and Gender**

Most of the investigation and controversy over applicability of the LSI-R to special populations appears to center on its utility for female offenders (Hollin and Palmer, 2006; Holtfreter and Cupp, 2007). Some studies find effective use for the LSI-R for both males and females. Manchak et al. (2009) compared 70 females to 1035 males convicted for violent offenses and concluded that the “LSI-R predicted 1-year general recidivism quite well for women. Although gender did not moderate the utility of the LSI-R in predicting recidivism, risk factors that best predicted recidivism differed for men and women.” Similarly, a 2007 study (Folsom and Atkinson, 2007) of female Canadian inmates serving 2 or more years assessed with the LSI-R and another instrument “indicated reliability and predictive validity for both measures, and both measures distinguished recidivists from nonrecidivists.” Finally, a recent meta-analysis of studies on LSI-R validity with female offenders (Smith et al., 2009) found “an average  $r$  value of .35 ([confidence interval] CI = .34 to .36) for the relationship of the LSI-R with recidivism for female offenders (N = 14,737).” The authors also examined possible gender differences but “effect sizes for males and females . . . were statistically similar.”

Nevertheless, some researchers do promote the need for more gender-specific assessment tools for females or at least more attention to specific factors more related to female recidivism than male. For instance, Heilbrun et al. (2008) compared male and female prison releasees on LSI-R subscale factors. Their results indicated that “[f]emale offenders received significantly higher ratings in companion and financial deficits, consistent with some prior research suggesting that social and financial risk factors for offending may be more substantial in women.” As an example of the latter, Holtfreter et al. (2004) found that the LSI-R was most successful predicting recidivism of females who “did not follow gendered offending pathways.” In a related study, Reisig et al. (2006) concluded that poverty as control variable obviated the LSI-R’s ability to predict recidivism and stated that “a commonly used actuarial risk assessment tool, (i.e., the LSI-R) does not sufficiently take into account the economic marginality of women offenders. At a minimum, existing tools should be refined or supplemented with other sources of information.” On the other hand, a study (Lowenkamp et al., 2001) looking at the effect of childhood abuse on later recidivism as predicted by the LSI-R decided that “the LSI-R is a valid (predictive) instrument for this sample of female offenders and that a history of prior abuse fails to add to the prediction of reincarceration, once risk is controlled for using the LSI-R.”

### **LSI-R and Mental Health Populations**

Not much appears currently available on the applicability of the LSI-R to offenders with mental illnesses. However, Ferguson et al. (2009) did find in Australia that “the LSI-R:SV is a good predictor of recidivism among mentally disordered offenders. However, the LSI-R:SV does not reliably predict recidivism in individuals who attracted a dual diagnosis. Further research needs to reevaluate risk factors associated with recidivism in offenders with a dual diagnosis.”

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### **LSI-R and Non-US or Canadian Populations**

Several studies have attempted to test the validity of the LSI-R outside its home base of Canada and the United States. Hollin and Palmer (2003) looked at violent English inmates and determined that they, “on the basis of either current or previous convictions, scored significantly higher than the nonviolent prisoners on the four LSI-R subscales of Criminal History, Companions, Education and Employment, and Alcohol and Drugs. In addition, those prisoners with a record of violent offenses gave higher LSI-R scores, indicating an overall higher risk of recidivism.” The same authors’ 2006 study of reconvicted offenders discovered that they had “a higher LSI-R total score, are in higher risk bands, and have higher levels of need on several subscales. With statistical control of key variable, the difference in total score remains, but differences in subscale scores largely disappear.” Finally, Palmer and Hollin (2007) examine applicability to female English inmates. They found that

*Comparison of the women’s scores with English male data showed a number of differences across areas of criminogenic need, although there was no difference in overall level of risk of reconviction. The predictive validity of the LSI-R with respect to reconviction showed reconvicted offenders to have elevated LSI-R subscale scores and total scores and to be in higher security bands. Multivariate analyses showed reconviction and time to reconviction to be predicted by the LSI-R total score, the Companions subscale, and the LSI-R security bands.*

A 2005 study (Mihailides et al, 2005) comparing inmates in Canada and Australia discovered that “[b]oth male and female Australian offenders scored higher on the LSI-R than Canadian inmates. Australian female offenders scored notably higher on the LSI-R than Canadian inmates. The overall profile of LSI-R subscale correlations also varied in Australian versus Canadian settings. An intra-country analysis of Australian data in isolation revealed that the relationships between LSI-R subscales was different for males and females.” A 2009 Australian study (Hsu, 2009) found as well “[n]o gender differences were apparent on the LSI-R total score, although female offenders scored higher than male offenders on the Finance and Family/Marital subscales. . . . Bivariate correlations and logistic regression analyses indicated that different subscales were predictive of reoffending by sex and sentence orders. Overall, the assessment instrument indicated modest predictive validity, with varying results for the different offender groups.” Finally, a 2006 German study (Dahle, 2006) of multiple risk assessment tools including the LSI-R concluded that “[o]n the whole, the instruments proved to be applicable to German criminals with only a few adaptations to the German situation, and they achieved a predictive accuracy comparable to the values reported internationally.”

### **LSI-R Management**

Since, as Lowenkamp et al. (2004; see also Flores et al., 2004) noted, “[t]o score the LSI-R assessment properly, practitioners conduct a semi-structured, one-on-one interview with the offender, using an interview guide that assists in the gathering of necessary

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detail,” therefore “[a]t a minimum, participation in a training session facilitated by individuals with a high level of expertise both in offender classification in general, and the LSI-R in particular, is necessary in order for practitioners to obtain the skills necessary to do the assessment properly.” In other words, key to successful use of the LSI-R is the successful implementation of its administration.

The authors pointed to two studies (Flores et al., 2004 and Lowenkamp et al., 2004) that linked training and effective delivery of the LSI-R to the assessment’s predictive validity. The first study found that “[t]he correlation for the agencies providing training is significantly higher than the correlation produced by the agencies without formal training . . . . Further, the agencies that had 3 or more years’ experience in using the LSI-R had correlations that were substantially larger (.25) than those produced by agencies with less than 3 years’ experience in using the LSI-R (.14).”

The second study looked at inter-rater reliability of scoring by just-trained practitioners. It concluded that “1) the vast majority of the practitioners placed the offender characterized in the vignette [used in the experiment] into the same risk level, and 2) an even higher percentage of practitioners recognized the same set of criminogenic needs in the individual described by the vignette and agreed on the magnitude/importance of those criminogenic needs as they currently existed in the offender’s life/environment.”

From these studies, Lowenkamp and his colleagues determined that

*. . . The LSI-R and other third generation risk/need assessments have greater usefulness than previous assessment methods. The LSI-R measures more relevant criminogenic factors than its predecessors, and it measures these factors in a dynamic way. Dynamic measurement allows for a more accurate and valid risk/need scale and allows for measurement of change in the offender over time. Due to the dynamic and comprehensive nature of the LSI-R, however, training and experience become extremely important. A lack of training (or “bootleg” training conducted informally by non-certified trainers) will result in reduced accuracy and effectiveness.*

Studies of actual implementation are apparently rare; however, Whiteacre (2004) interviewed case managers at a Midwestern federal prison to determine its use in the facility. According to the author,

*Results indicated a degree of discontent among staff with the LSI-R. Administrators thought staff needed more training with the LSI-R, while many staff members considered the instrument a waste of time and not helpful in determining programming. When used during offender interviews, many staff regarded the LSI-R only as a guide for discussion, although some staff did go through the instrument item by item. The LSI-R was considered most useful for assessing offender risk and needs and for planning supervision. The most frequent problems identified with the LSI-R by staff were concerns about its accuracy in predicting future behavior, concerns about bias, concerns about the replication of information, and concerns about unclear items. Overall, despite the general negativity among case staff regarding the LSI-R, most still reported using it in*

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*some way. However, the LSI-R was largely not used in the decisionmaking process concerning offender programming. Recommendations emerging from the findings include managerial clarification of the role of the LSI-R within the offender classification system and improved staff training with the instrument. The findings also underscore the need for more research projects focused on how assessment instruments are utilized in the field.*

### **Conclusion**

Increased interest in offender risk assessment in both sentencing and corrections has increased interest in the Level of Service Inventory-Revised and its related revisions. The recent research reviewed in this White Paper indicates that, properly administered, the instrument remains a very useful tool for these purposes, with the qualifiers and provisos noted herein, particularly regarding race/ethnicity and gender. The usual call for more research and evaluation, however, is particularly relevant here as the LSI-R is advanced into more jurisdictions, contexts, and uses, especially those for which it might not have initially been designed or conceived.

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